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THE ROLE OF CULTURAL GEOGRAPHERS IN INDUSTRIAL DECISIONS

by

STEPHEN S. CHANG[1]

Cultural geography can be beneficially applied to aid in industrial planning, management, and development. Decisions based upon purely economic terms of cost and return are insufficient. Other cultural factors must be considered, because they have a profound effect on industrial decisions. They may significantly affect the success or failure of industries. They are increasingly important in the present era of international investment and the establishment of industries in different areas with dissimilar cultures. The need for cultural considerations in management is exemplified very well in articles by Diebold[2] and Sethi[3] in *Business Week*.

It is often witnessed that cultural phenomena are only haphazardly taken into consideration while many others are missed. Cultural geographers are more attuned to the various aspects of culture. In this article, the qualifications and assets which allow cultural geographers to participate in industrial planning, management, and development will be discussed. First, however, it is necessary to give an example of the impact of cultural aspects on industries.

Concept of Wealth and Related Social Status — An Example of Cultural Impact on Industries. — The Cultural concept of wealth is intimately related to the process of industrialization. A new concept of wealth associated with an industrial society is required. Some variables, such as money, goodwill, credit, debt, and also patents and resource rights, are intangible forms of wealth. A successful industrial society requires that one have a good understanding of them, and be able to manipulate and regard them as wealth.

Many cultural groups still have traditional concepts of wealth. Today, especially, in many of the developing areas of the world, people often regard tangible items, such as land, as a form of wealth. It is more secure to invest one's

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[2] John Diebold, "Management Can Learn from Japan," *Business Week*, No. 2299, (September 29, 1973), pp. 14-19.

[3] S. Prakash Sethi, "Drawback of Japanese Management," *Business Week*, No. 2307, (November 24, 1973), pp. 12-14.

money in tangible goods, because barring any major sociopolitical upheavals, few risks are involved. Non-tangible items, however, are more risky. Investments in industries are very profitable when the time and situation are right, but wrong decisions can be very costly. Thus, some cultural groups still prefer to choose the safer forms of wealth to possess.

The concept of wealth is often reinforced by social prestige. In many cultures, it is prestigious to own land. A person with landholdings is often regarded as wealthy and possesses status in society. When such is the case, in these societies there would be very little internal initiative for industrialization because capital necessary for industrial development is tied up in land.

On the other hand, in industrial societies, certain groups understand industrial forms of wealth and associate prestige with the ability to provide jobs, and to employ and direct large numbers of people. A person who has foresight, takes risks, surmounts difficulties, organizes and manages personnel to generate great wealth is respected and admired. Mere ownership of purely tangible wealth, such as land and financial security is not enough. Groups with this cultural perception will most likely be industrialists.

An understanding of the concepts of wealth and social prestige attached to them is important when the industrialization of developing areas is considered. For societies whose cultural concept of wealth involves possession of tangible goods, the move or stimulus towards industrial development may have to come from foreign investments or government initiatives. Very little impetus will come from private individuals unless there is a change in the cultural concept of wealth. Meanwhile, for societies whose individuals have the concept of wealth associated with an industrial society, industrialization can come from private initiatives. Industrial development may progress more rapidly when people are attuned to life habits in an industrial society, such as daily working hours, punctuality, routine work in factories and education. Planning industrial development in different areas must be based upon differences in the cultural concept of wealth and the varying social prestige attached to the various forms of wealth.

In Hong Kong, for example, one can observe that most of the industrial leaders are Shanghainese. Many of them were successful industrialists in Shanghai. After their arrival in Hong Kong in the 1940's, they again started successful enterprises. They have an understanding of the concept of wealth associated with large industries as this is a part of their cultural history. They regard the wealth attained from business ventures as prestigious. They prefer to build wealth upon an industrial base rather than on the security of land and real estate ownership in which other groups invest. Industrial risks may be greater but the returns are more lucrative.

Once in a while, in a joking manner, in private conversations, sarcastic remarks are heard regarding those "shortsighted" and "cowardly" ones who put their money only in a secure tangible item — land. Industrialists with large factories and many employees are admired and praised. From these remarks it is obvious that land investors are held in disrepute by successful business entrepre-

neurs. To be sure, land ownership is perfectly acceptable and these industrialists also require it, however, it is not regarded to be as socially rewarding if this is the sole economic pursuit and means of generating wealth. This represents an example of the cultural aspect of the concept of wealth and social status manifest in economic and industrial development.

Qualifications and Training of the Cultural Geographer to Participate in Industrial Decisions. — From their training, cultural geographers possess a basic understanding of culture. Culture is defined here as the sum total of human experience.[4] Geographers are also concerned about a holistic approach of looking at problems. Therefore, a comprehension of all the cultural aspects in different areas is useful. A mere description is insufficient. Cultural geographers are, in addition, interested in how these various aspects interrelate and interact with each other and how they function in foregoing the cultural environments of given areas. Cultural geographers are, thus, well equipped by training to study and analyze related cultural variables systematically rather than on a hit and miss basis.

Two dimensions — space and time — are basic to all geographers and cultural geography is no exception. Geographers are constantly aware of the spatial dimensions — the similarities, differences and interrelationships of different areas. An understanding of the character or nature of areas can contribute to a correct implementation of industrial management methods and policies. Culturally similar areas can accept similar problem solutions while dissimilar areas may require different actions. This seemingly simple concept is too often neglected. Many entrepreneurs frequently disregard the cultural differences between areas, resulting in the consequent failure of policies or investments.

The interrelationships must also be considered, as particular areas may offer either complementarity or competition. For example, complementarity between areas can be in such terms as market possibilities, sources of raw materials, possible areas of further expansion and investment of manufacturing facilities. Areas also compete with each other by producing better and cheaper goods, struggling for markets, imposing tariffs, fighting for natural resources and the like. This is especially true in an era of multi-national corporations and internationalization of trade. An understanding of the cultural interrelationships between areas may help industries compete and prosper.

In examining the spatial dimensions, geographers have developed regional expertise. Superficial knowledge of a region will not suffice — only with a deep understanding of an area, almost to the point of total immersion in the regional culture, can the intricate cultural aspects appear significant to an investigator. Often the numerous cultural intricacies can be beneficially exploited in industrial decisions. Regional cultural expertise and the consciousness of spatial similarities, differences and interrelationships are significant and unique contributions geographers can bring to industrial planning, management, and development.

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[4] J. E. Spencer and William L. Thomas, Jr., *Cultural Geography*, (New York: Wiley, 1969), p. 3.

The temporal dimensions must also be considered in order to achieve a complete comprehension and evaluation of industrial decisions. To clearly appreciate the present cultural phenomena, one has to acquire an understanding of their evolution through time. Cultural history contributes in part to the outlooks and ways of doing things in an area. In addition, it must be recognized that nothing is stable, everything is in flux. All the cultural characteristics which exist today are continuously changing, some faster and others very slow.

In any industrial decision, a total understanding of these characteristics and an ability to predict and anticipate them are essential. Rapid adjustments and changes are essential for industries to maintain a competitive advantage. The past helps to condition the present. It also represents a cumulation of trial and error, mistakes and success, which can be translated into human experiences. The present is a result of a sum total of all the variables that are interrelated with each other, interacting with each other to form functioning systems which are in equilibrium. With the experience of the past and the understanding of the present, one is better able to establish and analyze trends for the future.

To show the importance of the spatial and temporal dimensions in business management (industries included), Mr. S. Prakash Sethi wrote in *Business Week:*

> The effectiveness of a management style must be understood with the cultural, sociopolitical and economic framework of the people who are doing the managing or being managed. While the cultural traits remain constant for long periods, the sociopolitical and economic environments do change, albeit slowly. Therefore, a given management style may not be effective (without modification) even in the *same* country in another time period, and in *another* country in any time period (even with modifications.)[5]

In the statements, Mr. Sethi shows keen awareness of the dimensions of time and space, although his use of the words "cultural traits" may be questioned. Mr. Sethi uses the words "cultural traits" in his article to refer to human behavior such as loyalty and fear of individual responsibility.[6] Cultural geographers regard sociopolitical and economic aspects as cultural traits as well.

Cultural geographers have an understanding of culture and can synthesize them together with a holistic point of view. They may also possess regional expertise and have a consciousness of the temporal and spatial dimensions in problem solving. These characteristics serve as a useful base for contribution to industrial planning, management, and development decisions.

There is, however, another important deficiency. Without a comprehensive understanding of business operations, the specific requirements and the problems of industries, cultural geographers can only provide a laymen's contribution, which would be dubious at best. In order to make concrete suggestions, cultural geo-

[5] Sethi, *op. cit.*, footnote 2, p. 12.
[6] Sethi, *op. cit.*, footnote 2, pp. 12-14.

graphers must acquire at least a modicum of industrial experience, perhaps through an apprenticeship in industry. This will familiarize them with the industrial point of view and manner of operation.

Much has been said regarding the need to expand job opportunities for geographers outside the academic profession. Here lies a golden opportunity for cultural geographers. Their worth, however, has yet to be proven.

It is useless for them to do merely case studies after the fact. Case studies are useful to uncover and develop concepts as well as to reveal new dimensions — they are experiences. In order to be functional, they must develop a predictive capacity based upon the experiences provided by case studies. They have to exhibit foresight and careful analysis before the fact in order to be helpful in planning and problem solving. Cultural geographers need to present the type of systematic analysis, insight and predictions that industrial management is incapable of obtaining. With this, they can prove their usefulness and become a vital part of planning. The above mentioned qualifications and training are all essential and necessary for cultural geographers interested in industrial decisions.

Differences With Other Disciplines in Contribution Towards Industries. — Geography as a discipline draws upon and integrates the knowledge from many fields of study. Many of the basic cultural concepts may come from other social science disciplines, such as sociology, anthropology, economics, history and psychology.[7] These related disciplines may deal with some of the cultural impacts on industrial and economic activities. For example, industrial sociology[8] and cultural economics[9] deal with many topics regarding the cultural impacts on industry or economics, such as labor, motivations, and social institutions, variables with which cultural geographers are also concerned.

The question of what contributions a cultural geographer can make that are different, better, or unique can then be asked. Geographers are able to use the holistic approach, integrating and synthesizing the various disciplines. Other disciplines may also make the claim that they are inter-disciplinary, therefore, the special contribution cultural geographers can make is this ability to consider issues with a consciousness of the temporal and spatial dimensions and the development of a regional expertise. The spatial and temporal dimensions discussed above are of basic concern to geographers and are important considerations in all decision and planning processes. Cultural geographers are especially concerned with the spatial distribution of cultural patterns, the interrelationship of cultural systems of different areas and their evolution through time. Because geography has always been concerned with regional studies, geographers can more easily excel in the generation of better and more detailed analyses in the understanding of regions than other social scientists.

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[7] Spencer and Thomas, *op. cit.*, footnote 3, p. 5.

[8] S. R. Parker, R. K. Brown, J. Child and M. A. Smith, *The Sociology of Industry.* (London: George Allen and Union, 1970), pp. 1-20.

[9] Howard S. Ellis, "How Culture Shapes Economic Growth," *Arizona Review*, Vol. 20, No. 1, (January, 1971), pp. 1-9.

Future Needs. — It has been discussed throughout this paper that cultural aspects are important to consider in industrial planning, management, and development decisions. For government and planning agencies, knowledge of cultural roles in industries can also be beneficial in policy decisions. The cultural geographer can make practical contributions in this respect and open up new opportunities in industry and government.

Cultural geographers have done little work on the cultural aspects of industrial location, management, planning, and development decisions. When cultural geographers deal with industrial topics, it is more in terms of a pervasive examination of the spatial distribution of industrial activities and their evolution through time as a cultural phenomenon in the course of human occupance of the earth surface. Little attention is paid to the effect of the cultural aspects on industries resulting in different management styles, development needs, locational problems, and the cultural character of industrial societies in various places. This is a virgin field to be explored by the cultural geographers.

In order for cultural geographers to make worthy contributions, proper training is necessary. Aside from the understanding of culture and the temporal and spatial dimensions, two additional attributes, in particular, are requisite. The first is the need for the development of a regional expertise. A second is the acquisition of practical industrial experience. Only expertise and experience can yield insight. Insights which others lack provide a person with a competitive edge and make him more valuable.

Owing to the dearth of studies on the impact of cultural aspects on industries, there exists a need for case studies of past and present industrial activities. These duties add to experience and open up new dimensions. These experiences are not in themselves concrete models or theories because every cultural problem is unique and each has its own subtleties. They can serve, however, as a frame of reference and assist us in future problems.

> Dr. Ellis wrote in his article "How Culture Shape Economic Growth": Cultural elements are frequently the most profound causes of the lack of economic development or its attainment. Lack of capital is a well-nigh universal limit to development, but the behavior of individuals and the character of institutions conditioning the supply of capital are more basic.[10] (Ellis, p. 1)

The same can be said for industrial planning, management, and development. Many of the economic criteria considered in the industrial development and locational models are over-all limits to the establishment of industries. On the other hand, cultural aspects, such as individual attitudes and behavior, cultural values and institutions, may be decisive in determining the success and failure of industrial ventures.

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[10] Ellis, *op. cit.*, footnote 8, p. 1.

COPRA DRYING SYSTEMS IN LUZON

by

JOSE O. JAUG, PACITA Z. MONTE
and ESTELA C. SALAZAR[1]

ABSTRACT

In a survey conducted recently, it was found that in the premier coconut growing regions of Luzon, the "Tapahan" system of copra drying is the more common method of processing copra. This system has two variants, namely: the "Indirect"[2] and the "Direct"[3].

Regardless of the system, however, the following interdependent factors are required in the production of good-quality copra: modern technology, right maturity of the coconut to be processed into copra and improved designs of copra drier.

In general the copra industry is based with so many widespread social and economic problems, for example the waking relationship between the hired harvesters and the coconut planters by and large should also be looked into. Last but not least, is the important role being played by hired laborers in the processing of copra from husking of the nuts to the finished copra products. Usually, coconut planters sell their nuts to copra processors. The more nuts sold irrespective of their maturity, the better for the planters.

Also the government should take active participation in the production of good-quality copra.

INTRODUCTION

UNDP has reported that in 1972, some 2.2 million tons of copra was produced by the Philippines from which 1,785,125 tons were exported. This quantity is over half of the world's normal output. Inspite of this remarkable produce a considerable portion of the expected copra was of inferior quality due to the lack of suitable incentives for the farmers to improve their processing technics. The absence of credit unions and the middle men's monopoly of the industry were the main cause for the copra farmers' indifference. In

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[2&3] The copra being dried are laid directly over the combustion chamber hence, the name "direct" is used, whereas the "indirect" method utilizes hot air in drying the copra which comes from the combustion chamber located away from the materials being dried.

general, price of Philippine copra is dictated upon by the copra buyers (middlemen) who pocket most of the profits of the industry thus depriving the farmers a profitable source of income. Farmers' cooperatives which should have been the source of liberal credit that would help the farmer in modernizing his processing technics are not yet well-organized, hence, up to now poor quality copra compose the greater bulk of exported copra.

REVIEW OF LITERATURE

The "Tapahan System" of producing copra is the most common method used in the Philippines (Eala, 1958). Approximately 88 percent of the copra is produced by this method with only 10 percent being processed by sun-drying and the remaining 2 percent treated in a combination of the two methods (Ramirez, 1971).

PROCEDURE

Surveys and on-the-spot investigations were carried out in the provinces of Quezon, Laguna, Camarines Norte, Camarines Sur, Albay, and Sorsogon from July to August 1973. The following activities were carried out in said places:

1. Evaluation of the different designs of copra drying systems;
2. Field surveys of the actual practices employed by copra processors;
3. Field interviews with coconut planters, harvesters, buyers, laborers, and exporters;
4. Ocular inspection of the conditions of copra stored in the bodega of copra producers, exporters and buyers;
5. Review of literature and researches on copra making; and
6. Collection of data on past and present technics that lead to the production of good or poor quality copra.

Sundried copra, according to Darrah and Tiongson (1969), is free from troublesome soot, is comparatively clean and seem to be preferred by some buyers. The two workers also reported that it is probable that most farmers owning small-sized landholdings are constantly beset with the problem of "rush for cash" in order to pay for their basic obligations (food, clothing, shelter, education, doctor's bills, etc.) and other debts. So that they can obtain cash right away, most copra farmers neglect proper processing procedure such as subjecting the copra to the optimum drying requirement and harvesting only the mature nuts. Based on several information gathered about copra making, commonly, the shortest drying period was 3 to 4 hours. This resulted in the production of really poor-quality copra. Another reason for the prevalence of poor-grade copra in the market is the ignorance on part of the farmers that they must produce better-quality copra (Eala, 1958).

Some copra processors claim that allowing the harvested nuts to stay in storage for sometime will condition the unripe nuts and thus facilitate husk-

ing and meat separation. Ripe nuts, however, should not be kept in storage for "conditioning". However, Emata (1971) recommended that drying of copra by indirect heat is the better and ideal method for copra making.

Authorities have found that it takes some 36 to 38 hours to produce good copra by indirect heating. In the IST speed drier, 12 to 18 hours drying is needed to produce superior copra. Slow drying thus, is conducive to the production of high grade copra. Authorities on copra-making claim that the best grade of copra can be produced when the drying time is within the range of 16 to 29 hours. The I.S.T. dryer can produce copra that possesses the following desirable qualities of whiteness, non-contamination and having a moisture content ranging from 8 to 11 percent. The pre-dried copra is subsequently allowed to stay in storage until the average moisture content is reduced to about 6 to 8 percent and is then sold as "Resicada Bodega", the highest classification of copra.

The quality of copra is also affected by the maturity of the harvested nuts. Copeland (1931) emphasized that "if immature nuts are used in copra-making, the chief loss is not so much because less copra or poor copra is obtained from these nuts, as because poor copra mixed with good copra lowers the market value of the latter and so keeps the planters from getting its real value even for the good copra which he may produce". Also, Copeland (1931) cited Walker's finding "that nuts cut from the trees increase in yield of copra and oil if allowed to stand in piles for some weeks before they are opened. This is naturally not to be expected if the nuts are allowed to fall from the trees when ripe, and are then collected from the ground. In this case, they should be used without delay. The practice of letting the nuts lie in stocks after they are fully ripe is one of the reasons given for the lower quality of much Ceylon oil, as compared with that from Cochin".

"Good copra is more valuable if marketed in large pieces than if broken up. Therefore, the meat should not be removed from the shell until it begins to shrink".

RESULTS AND DISCUSSION

The "Indirect System". — This system is characterized by a deep excavation over which a platform made of woven bamboo slots or iron grills are laid to hold the coconut meat still in the shell for drying. This platform is called the *drying chamber.* The excavation can be either sloped, the lower portion of which starts from the source of heat (the combustion chamber) and gradually rises at approximately 20 to 30 degrees angle to the other end of the drying chamber farthest the source of the heat to unsloped which means that the depth in all points are the same. A tunnel connects the combustion chamber to the excavation over which the drying chamber is laid. The combustion chamber is also a deep excavation ranging in depth from 2 to 3 meters depending upon

the whim of the maker or owner of the drier. The drying chamber is either raised a few feet or at ground level. Walls around the drying chamber are constructed 2 to 3 feet above the ground level to hold coconut to be dried and prevent sliding of the dried chamber in a layer with the shells turned upward. Drying of the copra during the first phase is done 3 to 4 hours after which they are removed for cooling and for separating the meat from the shells. The copra in the shells are placed on either cemented or pure dirt flooring. The entire system may be covered with nipa or galvanized roofing; the former being the most prevalent.

The average size of the drying chamber is 6.5[1] 13[1] meters with a depth of about 2 to 3 feet and the commonly used fuel is coconut shell. Several materials such as coconut trunk, cement, wover bamboo slots or lumber can be used for constructing the walls around the drying chamber. It was observed that the usual practice in all places visited was to dry the copra in the shell for 3 to 4 hours after which they are removed from the chamber cooling. The cooled copra are then ready to be separated from the shell. Redrying then follows immediately. The copra (with or without the shell) are placed in a layer facing downward.

The capacity of a drying chamber measuring 2 x 4 meters is 1,000 to 1,500 nuts per setting. The laborers are paid usually from ₱30 to ₱40 on a per ton dried copra basis. It has been observed that the copra produced by the "Indirect System" when held in storage is generally brownish-black with some moldy growth on it. Approximately, 10 to 20 percent of the copra processed from immature nuts was observed around San Pablo City, Lucena City, Alaminos, Sariaya, Tiaong, Tayabas and Candelaria. Immature nuts to be made into copra are not harvested in Baler, Quezon, Camarines Norte, Camarines Sur, Albay, and part of Sorsogon.

Immature nuts are harvested and turned into copra due to the:

(a) mistake in harvesting;

(b) desire for quick cash;

(c) availability of immature nuts rejected by nearby dessicated processing plants such as the Red-V in Lucena City, Franklin-Baker and Peter Paul in San Pablo City. Many of the copra makers are either coconut planters or buyers or a combination of both.

On the average, the copra dyers are not permanent structures. They are usually improvised from dilapidated nipa huts, the capacity of which range from 500 to 2,000 nuts per drying time. The copra are bought by the copra buyers right at the farm or are brought to the copra buyers in the poblacion by the copra makers. The copra produced under "Indirect System", it was observed, need further improvement in quality.

The *"Direct System"*. — In some localities in Quezon Province, the "direct system" is used in copra making. "Direct" means that the "drying chamber is immediately over the combustion chamber". The "direct system" is constructed either on an elevated platform or level to the ground. A low cost construction is made out of local materials, such as split coconut trunks and woven bamboo slots or timber. Usually, coconut shell is used as fuel for materials to be dried. The copra produced by this system is comparable with that produced by the "tapahan" type depending upon the length of time drying is done. Quick drying from 3 to 5 hours will not produce good-quality copra. Some copra dryers in Baler, Quezon, Camarines Norte, Camarines Sur, Albay, and parts of Sorsogon use the "direct" type. In most cases, copra in the Bicol Region like those obtained in Laguna and Quezon are crude, but unlike that of the two latter provinces, the copra produced are of better grade. The reason better quality is produced in Bicol is that the nuts are harvested at the proper stage of maturity.

Social Implications. — The publication of better-quality copra is not entirely dependent on improved technology, maturity of the coconuts copra, design of the drying system, and the fuel to be used. Relationships between the copra owners and the buyers should also be taken into consideration. Also, the working relationship between the harvesters and the owners of the copra should be looked into. Often, the buyers dictate the price of the copra. Copra buyers impose penalty on the sellers or producers for delivering copra with considerable moisture in it. Copra, allegedly containing too much moisture as claimed by the buyers is sold under a 10 to 20 percent discount, although, in reality the copra has only 8 to 10 percent moisture in it. The moisture meter which is supposed to be used by the buyers is nowhere to be found.

The processing of copra is an affair between the owners and the laborers. In some small enterprises, the owners process their own copra. If hired laborers, however, should do the processing, payments ranging from ₱30 to ₱40 is given for every ton of dried copra. For this reason, the laborers do not care much about the quality of copra as long as they meet the required quota and subsequently the payment due it. The same is true with the harvesters who are paid by the thousand nuts harvested. To be able to collect the maximum number of nuts, both the immature and mature nuts are harvested. Consequently, poor-quality copra is produced.

The social implications of copra-making needs proper and further scrutiny; and, satisfactory solution of its problems should be undertaken without delay. If the price of copra is dictated upon by copra buyers, the quality of copra will not be improved no matter how much known technology and proper design of copra dryer are available.

SUMMARY

1. The "Indirect system" of copra drying is the more common method practiced in Quezon, Laguna, Camarines Norte, Camarines Sur, Albay and part of Sorsogon, although the "Direct system" could also be found in these places.
2. Between the two, the indirect system of copra drying is the better method.
3. In the regions adjacent to San Pablo and Lucena, poor grade copra are produced due to the mixing of immature with the mature harvested nuts.
4. In the Bicol Region where the same kind of copra driers are used, the copra produced are of better grades due perhaps to the elimination of immature nuts in copra making. Good quality copra is also produced in Baler, Quezon.
5. Production of good-quality copra is not the exclusive function of technology, appropriate material and design of copra drier. In addition, the relationship between these three interacting groups should be considered for they are important factors in the production of good-quality copra: (a) the copra maker and the copra owner, (b) the harvester and the planter, and, (c) copra-making laborers and copra owner. All these are grouped under the heading of "Social Implications."

RECOMMENDATIONS

1. Enforcement of the use of moisture meter by the copra buyers.
2. Recruitment of more copra promotion officers and their assignment in the premier coconut producing districts of the country.
3. Granting of bonus to copra processors for producing good-quality copra.
4. Construction of model driers in every locality comprising some 1,000 hectares of coconut lands.
5. Issuance of information bulletins concerning proper method of copra making.
6. Design of low cost driers should be made available to coconut planters.
7. There should be a continuing education of coconut planters to be conducted by concerned coconut agency.

THE ECOPLANNER METHOD OF URBAN ANALYSIS[1]

by

ELIZABETH PHILIPS & CATHERINE FORTLAGE

The purpose of this paper is to provide those who are interested or involved in town planning, urban design or community planning, with a logical method for integrating all the mass of information collected from many different sources. The first part of the paper describes the Ecoplanner method for setting out and integrating new developments, urban or rural, renewal or conservation, into the existing community, and the second part illustrates the method with a case study of a Scottish Border town threatened with development. The Ecoplanner model was designed by the authors to provide planners and urban designers with a tool which would enable them to understand complex urban problems rapidly and thoroughly, and to make decisions in future development with confidence. The philosophy of ecosystem planning and the techniques of the Ecoplanner have been developed concurrently over a number of years. Projects already designed using the Ecoplanner model range from family size ecosystems to populations of 70,000 and from rural Africa to cosmopolitan Vienna. The traditional biological ecosystem model is described in terms of the animal and plant species and the transfer of energy from one to another. In a human ecosystem this idea has to be modified if the complex relationship between humans and their environment is to be understood, so we divide the pattern of human life into its component activities. These activities are distinguished in the model to show their effect on each other and on the system. Every activity makes demands on the system for the use of resources which are classified under different headings in order to assess the total needs of the system. The activities affect one another by giving or taking resources and these transfers can be related to external systems; this transfer of sources can be shown on a multi-dimensional interaction matrix. Some resource transfers can be qualified such as cash or manpower, but many, such as friendship or fear cannot be qualified but have a quality which can be assessed in a particular system. One of the most important functions of the Ecoplanner model is to show how the "black box" property of an activity can change tangible resources into intangible resources. These three components — *activities, resources,* and *relationships* — from the basic Ecosystem model. Because an ecosystem is dynamic it is not desirable to produce standard models, but all ecosystems are subject to the laws of systems analysis.

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THEORY

Ecosystems obey systems theory in that they can be described as "open" or "closed" depending on the number and type of linkages between activities, and it is necessary to establish the type of system being studied as soon as possible, as the provision of new links and the strengthening of existing links is one of the ecoplanner's most important jobs. All systems obey the laws of entropy, and human ecosystems are no exceptions to this rule; provision must be made in the proposed ecosystem developments for the constant input of new energy into the system, either as money, manpower, trade, or any other energy source which will prevent the system from collapsing.

It is absolutely vital however not to treat all energy inputs as common units (this method is used in some biological ecosystems) since, in human terms, different types of energy cannot be exchanged one for another; fossil fuel cannot replace water as a source of energy for mobile machines, and coal cannot be exchanged for fodder as a source of energy for cattle farming. Each type of energy source must be kept as a separate entity in the model. It is true that every activity has a "black box" effect on the flow of energy passing through it, but this effect can only change the direction of the flow or act as a catalyst for another flow; the activity cannot change the resource itself, and unless this is clearly demonstrated on the model the conclusions drawn from the flow of resources may be very inaccurate.

Because of this complex pattern of linkages created by different types and strengths of flow, it has proved unsatisfactory in practice to distinguish independent and dependent variables: all components of an ecosystem are variable and none are independent—there are only degrees of independence which can be assessed crudely by counting the number of linkages. In practice it is apparent during the construction of the model that some components can be varied easily and that others are so integrated with the system that variations will have widespread effects, and this hierarchy of variability is sufficient to guide the planner. The most important thing to realize is that physical planning is not sufficient unless combined with economic and social planning, and this means involving those with knowledge of all the activities in the ecosystem in the planning process.

In order to construct a satisfactory ecosystem model the planner must be in harmony with his work throughout the process; he must work neither too fast so that he skips vital data nor so slowly that he becomes bored and does not absorb information. To achieve this harmony natural human brain mechanisms are employed rather than more sophisticated software which demands brain training. These brain mechanisms are, first the pattern seeking habit which enables the planner to comprehend the systems and sub-systems of his projects. Second, the action habit of describing work and play as actions which leads naturally to activities. Third, the list making habit which helps to catalogue resources; and fourth, the habit of association which helps the development of relationship mat-

rices. Fifth, the habit of orderliness which seeks to complete patterns and helps to trace unresolved links in the matrix and sixth, the habit of curiosity, valuable for identifying key components which may help to solve the planners problems. Because an ecosystem model is a random input ordered output heuristic model these brain machines can operate freely, the model itself ordering data input and indicating any further data required. The value of this apparently unscientific approach to ecosystem analysis is that, because natural brain mechanisms are employed, the data and its significance are programmed into the mind of the planner and are stored for instant recall during the design process.

In most systematic design methods much attention is given to the process of decision making and weighing of factors. We have spent much time trying different methods of weighing and evaluation but practice has shown that decision making is a direct function of knowledge, the better the knowledge of the ecosystem the easier it is to make decisions and in practice the number of constraints operating on a system are so great that the possible solutions are very few and the optimization of these is controlled by public or private interest outwits the planners control. Christopher Alexander has advocated the inductive approach — *i.e.* "the break into little bits and sort it out technique" whereas the ecosystem concept follows Karl Popper's attitude to deductive thinking. It is only the sense of wholeness that can help the designer to create solutions to the communities' problems which not only resolve individual difficulties or needs but develops that "civitas" which is the real foundation of all good communities.

THE ECOPLANNER MODEL: CONSTRUCTION AND USE

The Ecoplanner model has been developed by our research group concurrently with the basic theories of ecosystem modelling during the last six years. From the start, one major objective was to design a model suitable for both skilled and unskilled users. Because of the multi-directionary data inputs to the model, it acts as a truth-seeking device and the optimum truth level can best be achieved if representatives of the whole range of people concerned with a system participate in the construction of the model and therefore the model must be simple in concept and form. This objective eliminated the professional mathematical model, the analogue models, and the simpler mathematical models which require expensive hardware. The current Ecoplanner model (Mark III) is constructed with hardware available to the poorest and least skilled community and in theory, it could be set up with pictograms by an illiterate population. The use of cheap disposable hardware also encourages rapid and frequent updating of the model. The use of simple hardware does not inhibit the application of sophisticated thinking or the input of complex data. The Ecoplanner has been used for British, German, Belgian, French, Morrocan, Malawian, Indian and Italian projects and neither race, language nor culture have created any problems in the simulation of the native ecosystems.

The model is constructed on two 8 ft. by 4 ft. (2.40 m × 1.20 m) perforated boards with holes 3/4 ins. (19mm) centres and the in. information is displayed on cards, maps and diagrams. The information is set out in six parts:

1. The description of the activities in the ecosystem A6 cards — (6 ins. by 4 ins.)
2. The schedule of the resources needed by the activities A8 cards (3 ins. by 2 ins.)
3. The relationship (transfer of resources) between activities — A8 cards (3 ins. by 2 ins.)
4. The chronology of the activities (timescales) — standards A3 sheets.
5. The distribution of the activities and the resources-maps of the area.
6. The appraisal of the ecosystem and policy decisions — A6 cards (6 ins. by 4 ins.)

The sequence of operation in setting up an Ecoplanner model is described in the following stages:

First Stage. — Decide the boundaries of the ecosystem to be studied. These may vary as the study proceeds, but it is important to get agreements in the approximate boundaries at the beginning. If the purpose of the study is to manipulate an ecosystem to achieve certain goals, these must be stated.

Second Stage. — Determine the level of the ecosystem: is it at village level, or town level, or regional level? In most cases it is necessary to study several levels at once in order to obtain a true picture but there is usually one main design level at which decision must be taken and it is this level which must be clearly established.

Third Stage. — Set up outline model. This contains all the components of the full model, but it is a general description of the ecosystem only and is not qualified or accurately detailed. The data entered into the model is in the form of short statements outlining the work to be done in the final stages and is used as a set of job cards which are cancelled as the final date is entered. The purpose of this outline ecosystem is to assess the tasks required and to programme the planner's brain.

Fourth Stage. — List the activities contained within the ecosystem. It is not necessary to quantify them at this stage. Most ecosystems have been 12 and 18 activities at each level. If the number exceeds this, the entries are too detailed in comparison with others. If there are fewer, the converse will be the case. However carefully this list is compiled, it is likely to change as the work proceeds.

Fifth Stage. — Survey the resources available for each activity and examine the gaps in these available resources. When the study is complete it will be necessary to indicate which are existing and which it is proposed to add or delete.

The term "resource" covers all the supplies necessary to maintain or initiate an activity or to improve it, whether these supplies are tangible or intangible. For the purpose of studying an ecosystem it is convenient to divide the resources into a few main headings. These will naturally vary according to the nature of the ecosystem and its level of complexity, but the following headings are listed as a useful basis:

1. Physical resources
2. Infrastructure resources
3. Sensory resources
4. Economic resources
5. Constraints

Sixth Stage. — Plot the transfer of resources between activities within and outwith the system on the matrix; these should be written up as accurately as possible. The relationships will be found to start off as vague generalities, but they will become more definite as the study progresses. The relationships between activities is the transfer of one or more of the resources described in stage five. Relationship cards: — These relationships are simulated on the Ecoplanner Board by means of a two-way matrix. This enables the planner to show what each activity gives to others and what it takes from others. The total transfers of any one resource throughout the ecosystem, when collated, form a "cycle" of that resource similar to the biologist's nitrogen or carbon cycle. It is important, when constructing a model of the ecosystem to check that all the resource cycles have been recorded; obviously it is not possible to record a cycle of certain resources such as noise, or pleasure but the infra-structure and economic resources are easily checked. Typical cycles of interest to the planner would be: — cash flow — transportation — pedestrian movement — water supply and drainage social contact — legal control.

Seventh Stage. — Plot the intensity of each activity on one or more suitable time scale; these will show how the intensity varies throughout the scale.

Some resources are single use resources throughout time — that is to say, they are fully and continually used to support one activity; these resources cannot be used to support any other activity. Other resources are multiple use resources throughout time — that is to say, they can either be shared by several activities at a time or because they are used intermittently the resource can be transferred from one activity to another. The simplest way of showing timescales is to plot the intensity of the activity against each unit of time, giving a variation of 0-100% intensity.

Eighth Stage. — Plot the resources already studied on a map or model of the area to show the location of resources in space and plot the distribution of activities to show their location in space. For the sake of clarity it is better to prepare two or three maps showing the spatial location of activities at key times, such as working hours, holidays or evenings. The physical movement of

resources may also be shown diagrammatically on the maps to indicate preferred routes. Physical resources should be entered on to base maps using standard Town Planning codes and colours.

Ninth Stage. — Prepare the overlays and reports to show critical aspects of the ecosystem. These might be:

Cash flow — shown on the relationship matrix
housing — shown on the resources map and on the resources schedule
public transport — shown on the relationship matrix and activity distribution map.

Trace through the activities and resources affected by the manipulation and enter the changes on to these card and maps. It is advisable to trace the effect of altering one critical activity through the whole ecosystem before dealing with the next one.

Tenth Stage. — Appraise the strength and weakness of the ecosystem. Set out the manipulations required within the ecosystem in order to achieve the desired goals. Describe the steps necessary to implement the goals; this is particularly important when the manipulation involves phasing specific activities in order to achieve a smooth change and to avoid planning blight.

The proposed manipulation must be checked by simulation in the Ecoplanner model to ensure that no resource transfers are overlooked and that the thresholds of resources are not exceeded.

CONCLUSION

To sum up, the research team discovered that the deeper the understanding of the community and its problems the lesser the justification for suggesting major alterations to the ecosystem. This thinking parallels that of current natural ecology which holds that interference with ecosystems is highly dangerous unless the system is fully understood. The philosophical conclusions which can be drawn from this are that the planner must disturb an ongoing ecosystem as little as possible when seeking to strengthen it and that any growth of the system must follow natural morphological patterns and growth rates and therefore all proposed manipulations must be integrated with the established system.

BOOK REVIEW

ATLAS OF AUSTRALIAN RESOURCES — SECOND SERIES. Geographical Sections, Division of National Planning, Department of Minerals and Energy, Canberra, Australia.

The Atlas of Australian Resources as of this Second Series, consists of the following topics (1974):

1. Landforms
2. Geology, 2nd Edition
3. Mineral Deposits, 2nd Edition
4. Climate
5. Temperature, 2nd Edition
6. Rainfall, 2nd Edition
7. Surface Water Resources
8. Groundwater
9. Water Use
10. Land Use
11. Soils, 2nd Edition
12. Cropland, 2nd Edition
13. Crop Production
14. Livestock
15. Grassland
16. Sheep and Wool
17. Forest Resources, 2nd Edition
18. Fish and Fisheries
19. Mineral Industry, 2nd Edition
20. Electricity, 1st & 2nd Editions
21. Population Distribution & Growth
22. Immigration, 2nd Edition
23. Roads & Aerodrome, 2nd Edition
24. Ports & Shipping, 2nd Edition

The Atlas of Australian Resources which started in 1952-1960 is indeed a wonderful work of many experts depicting the resources of the nation. Published separately by areas, a subject matter like water use can be carried in a brief case or folder for ready reference. The whole second series 1974 of 24 topics is the general picture of Australian Resources today.

"With the publication of each map-sheet and commentary of the second series, a map-sheet and commentary of the first series are withdrawn from the Atlas. The above list will therefore, only be completely up to date until the next map-sheet and commentary of the second series are issued."

"(While stocks permit, gratis copies of the replaced map-sheet and their commentaries will be made available to organizations and persons having special need of them on application to the Director, Division of National Mapping, Department of Minerals and Energy, Canberra)."

D. Z. ROSELL

1972 NATIONAL ECONOMIC ATLAS — Republic of the Philippines, Department of National Defense, Philippine Coast and Geodetic Survey, Manila, 1973; 16 3/4 x 21 3/4 inches. Price — P75.00 or US$16.00, postage paid by surface mail.

"The National Economic Atlas of the Philippines is published to update the 1966 Philippine Economic Atlas and to provide a comprehensive compilation of diverse statistics relevant to the country's economy. The materials for this Atlas were gathered from various public and private sources which extended to it a broad base of economic information and practical usefulness as an authoritative references."

The 1972 Economic Atlas was initiated with encouragement of the National Committee on Geographical Sciences, National Science Development Board as a joint project of the former Board of Technical Surveys and Maps and the National Science Development Board.

Various surveying and mapping agencies of the Philippines extended invaluable cooperation and assistance in the preparation of this Atlas. The Lambert Conformal Conic Projection was used and the scale of 1:4,000,000 was adopted in order that various data included in the Atlas may be utilized to the maximum degree by various government agencies and private entities which are greatly concerned with the economic development of the country.

The table of contents is divided into four parts, as follows:

Part I — General Reference, which consists of Political subdivision and Regional division.

Part II — Physical, consists of Relief, Geology, Metallogenic Provinces, Soils, Surface Water Resources, Ground Water Resources, Climate and National Park and Wildlife, Preserved Areas, Historical and Tourist Spots.

Part III — Economic, Soil Cover (Land Use) Cadastrally Surveyed Areas, Irrigation Systems, Rice-Corn-Sugar Area Production, Coconut-Abaca-Timber Production, Livestock and Poultry Production, Fishery Resources, Mineral Distribution — Metallic, Mineral Distribution, Non-Metallic, Population Distribution & Density, Manpower Resources, Cultural-Linguistic Groups, Literacy, Domestic Water Supply Facilities, Health Facilities, Transportation Facilities, Communication Facilities, Power Resources, Industrial Distribution: Cement, Textile & Chemicals, Industrial Distribution: Steel, Plywood & Mining, Trade Centers & Trade Areas, Commercial and Rural Banks, Income for Cities and Provinces (Tax) Per Capita.

Part IV — Indexes of Coverage; Topographic Map Index, Index of Nautical Charts, Index of Aeronautical Charts, Areas covered by Aerial Photography.

The 1972 Economic Atlas of the Philippines will provide basic data to the Geographer, Businessman, Educator, Economist and every Professorial man and woman who want to know about the resources of the country.

D. Z. ROSELL

THE NATIONAL COMMITTEE ON GEOGRAPHICAL SCIENCES

I. Organization

On September 9, 1966, Professor Shiba P. Chatterjee, the first Asian to assume the presidency of the International Geographical Union (IGU), visited the Philippines and took time out with Dr. Juan Salcedo, Jr., then Chairman of the National Science Development Board (NSDB). Among others, he invited the Philippines to become a member of the International Geographical Union.

On March 5, 1968, the NSDB Governing Board adopted resolution NSDB 258 R. — empowering the NSDB Chairman to enlist the Philippines as member of the International Geographical Union with the NSDB as the adhering organization and to create a committee to be composed of NSDB personnel and representatives from the government and private agencies or entities which shall serve as the national working and advisory organization of the NSDB and to act as liaison to the International Geographical Union.

On July 24, 1968, pursuant to Board Resolution No. 258 R. 6 which was adopted during the 258th regular meeting of the Governing Board held on March 5, 1968, the NSDB Chairman issued NSDB Office Order No. 013 creating the National Committee on Earth Ssciences with Section on Geography to serve as the National Working Organization in relation to the function of the National Science Development Board in promoting its objectives. The Committee was composed of fifteen members representing different government and private agencies.

Professor Dominador Z. Rosell was designated as the Organization Chairman and Mr. Jose O. Jaug as the Committee Secretary.

On September 18, 1968, NSDB Office Order No. 013 dated July 24, 1968 was amended by NSDB Office Order No. 014 increasing the membership of the Committee from sixteen to twenty four and making it by agency instead of by particular person.

Under this amended office order, the National Committee on Earth Sciences with Section on Geography was composed of twenty-five organizations, government and private.

On January 30, 1969, the Committee adopted a resolution changing the name of the Committee on Earth Sciences with Section on Geography to National Committee on Geographical Sciences, which was approved by the NSDB Chairman on February 21, 1969. On the same date, a resolution was also adopted changing the title of the Secretary to Executive Secretary.

Monthly meetings of the Committee were held.

On June 28, 1971, in conformity with the policy of the NSDB to reduce membership of the National Committee under its specialized discipline and to forestall the unwieldy situation in a big body, NSDB Office Order No. 014 was amended by NSDB Office Order No. 09, Series of 1971 reducing the membership of the Committee from twenty-five to fifteen. Under this amended Office Order, the NCGS is now composed of the various disciplines of geography represented by the member agencies.

On March 23, 1972, Dr. Emilio B. Venus was appointed as Executive Secretary of the NCGS vice Mr. Jose O. Jaug.

On February 1974, in line with the policy of the NSDB to reduce to a minimum the membership of Technical Committees under its specialized disciplines and due to the abolition and/or changes in names of some member agencies, NSDB Office Order No. 09 was amended to reconstitute the membership of the National Committee on Geographical Sciences. Under this amended Office Order, the NCGS is now composed of the various disciplines of geography represented by the member agencies. The representatives of the member agencies are as follows:

Agency	Representative
1. Philippine Geographical Society	Dominador Z. Rosell
2. Bureau of Coast and Geodetic Survey	Antonio P. Ventura
3. Bureau of Mines	Oscar A. Crispin
4. National Irrigation Administration	Benjamin U. Bagadion
5. Bureau of Soils	Godofredo Alcasid, Jr.
6. Bureau of Forest Development	Martin R. Reyes
7. Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)	Wellington A. Miñoza
8. National Census and Statistics Office, NEDA	Antonio Samson
9. Department of Agrarian Reform	Carlos B. Umil
10. College of Arts and Sciences, UP	Domingo C. Salita
11. Commission on Volcanology	Gregorio A. Andal
12. Ex-officio Member (non-voting member)	Elvira O. Tan

The following are the terms of reference of the National Committee on Geographical Sciences :

1. To promote and stimulate research in geography as one of the effective instruments in nation building;
2. To promote geographic education in all levels of education and disseminate geographic knowledge to all sectors, both government and private; and

3. To act as international liaison or adhering body for NSDB to such international organizations as the International Geographic Union and the International Council of Scientific Union.

II. Activities of the NSGS for the period January to September, 1975

One of the most significant activities of the Committee is the formulation of a project proposal, "Descriptive Atlas of the Philippines."

The Committee will endeavor to put up a Descriptive Atlas that will be up to date and leveled to the goals of national development. The members of the National Committee on Geographical Sciences who are technical men from different bureaus and agencies of the government, with their rich background, will provide data on their respective expertise bearing on the Atlas of the Country. This project will put together the collective wisdom and talents of the members of the Committee in the production of the Atlas so vital in the country's problems of social, economic and political development.

Upon completion of this Descriptive Atlas of the Philippines, it will be published in book form for use in schools and colleges as well as the general public.

The Committee also, has designed a banner which is now under consideration by the Heraldry Committee.

In December 1974 the Chairman of the NCGS, Prof. Dominador Z. Rosell, was sent by the National Science Development Board to represent the Philippines in the 19th Regional Conference held in New Zealand on December 4-11, 1974.

DEPARTMENT OF MINERALS AND ENERGY
Division of National Mapping
Canberra City, Australia

NATIONAL ATLAS MAPS ISSUED

The Department of Minerals and Energy has released two further map-sheets and booklets in the second series of the Atlas of Australian Resources.

They are "Government" and "Railways", second edition.

The Government sheet is divided into two sets of maps. One shows federal electorates and voting results for the general elections to the House of Representatives in 1969, 1972 and 1974. The other shows State and local government areas and, in addition, the population numbers of municipalities and the population density of shires at the last census.

The Supplementary booklet outlines the basis, functions and relationships of national, State and local governments, as well as analysing the pattern of voting for the Australian Parliament.

The railways sheet provides general information on railways in Australia, such as the various gauges, ownership and capacity of tracks, as well as portraying freight and passenger movements, servicing centres and numbers of employees, and the historical growth of railway lines. Inset maps show the suburban railway systems.

The booklet amplifies these aspects of Australia's public and private railways and provides a brief commentary on the economics of railway construction, modernization and operation.

These two large, multi-coloured map-sheets were prepared by the Department's Division of National Mapping.

Copies of each sheet, with its booklet, may be bought for $1.50 each from the Department of Minerals and Energy in Canberra, Sydney and Melbourne and from book centres of the Australian Government Publishing Service.