

GEOGRAPHICAL CONTRIBUTIONS TO ALTERNATIVE DEVELOPMENT APPROACHES FOR LEAST-DEVELOPED NATIONS

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There is a fresh concern with poverty in international forums, the definition and roots of which are not entirely clear. The international agencies, the World Bank, the rich nations (OECD), the rich-poor (OPEC)--all speak of the need to address development to the poor. The poor are variously defined, sometimes as the poorest strata of all developing nations and sometimes as the poorest nations among the developing nations. In our collective research efforts as the Clark University Program for International and Social Change, we do not equate the two definitions. Rather, we think that the poorest nations have distinctive characteristics by virtue of being nation-states that differ from the poorest peoples as a social class.

For example, the harsh human environments of the world are the borderlands of snow and desert. When such environments coincide with isolated independent nation-states of Africa or Asia, they constitute most of the set of least-developed nations. The United Nations compiled the roster of the poorest of the poor on the basis of national income, manufacturing activity, and literacy. To note also that such states fall mainly into two environments--the Sahelian-Sudanic, semi-arid zones of Africa and the semi-tropical, hill lands of South Asia, and to observe that they are landlocked, isolated, and devoid of major known resource endowments is to discover that while environment does not determine global poverty, it can exacerbate it.

Our preliminary appraisal of the least-developed nations suggests that broad commonalities characterize almost all of the least-developed. The investigation further suggests that these commonalities can be described in terms of human ecosystems and economics. For these common conditions, unconventional and non-traditional development approaches can be devised with some promise of broad applicability. For in the face of failure of conventional approaches for the world's least-developed, new approaches are vital. Such approaches will need to be centered on local opportunities for human betterment through the elimination of hunger, the eradication of poverty, and the provision of employment opportunity. In such efforts, ecological reality and cultural tradition will need to be recognized more forcibly than they often are in conventional development programs.

Common Groups Within The Least-Developed Nation

Preliminary analysis of readily available data has already been completed in an attempt to confirm the United Nations designation of the twenty-five least-developed and to identify groups of countries with common characteristics among the least-developed. (International Development and Social Change, 1974; Campbell and Katz, 1975). The initial analysis suggests that while most countries on the United Nations list of twenty-five form a distinctive group, other poor nations should also be considered. We added thirteen nations with per capita gross national product less than \$200 (1972) and a population of less than thirty million. For these nations, we conducted a principal component analysis using thirty-seven variables for the thirty-eight nations under consideration. Within this large group of thirty-eight countries, distinctive sub-groups emerge.

We intend to use these sub-groups of countries as one focus for our future research. Through these investigations, we hope to identify a series of problems which are unique to these particular national groupings and towards which we can address alternative approaches to development appropriate to them. In so doing, we hope to contribute a sharper focus or perhaps more accurately a series of shaper foci which will be preferable to the current practice of viewing the least-developed nations as, on one hand, a homogeneous group, and on the other, a series of individual countries in need of highly idiosyncratic approaches. With this aim in mind, for practical purposes of study and action, we have clustered these countries into seven groups of least-developed, comprising 35 of the 38 nations studied. These are shown in Figure 1 and Table I.

Current Development Approaches

The foregoing common characteristics of least-developed nations are, of course, not unique to these nations. Indeed, large regions of similar size and problems are found within the national territory of other developing nations; for example, the northeast of Brazil or the hill-lands of India. But within such larger national context, complementarity of resources is possible, out-migration of population can take place and redistribution of national wealth can be sought. For the least-developed nations, such transfers of wealth or complementarity of opportunity requires a world or regional community of interest and responsibility, and such a community is still unformed. Thus, a severe challenge is raised to the leaders of these nations, to the dispensers of development, to the dispensers of scientific knowledge and to the seekers of world community.

For the thoughtful leadership of the least-developed countries, self-contemplation offers sobering prospects. All conventional development strategies involve the initial increase of inequalities within countries—some place or some industries grow faster, some people become better educated or wealthier. In time, a trickle-down effect should take place and in theory, all should be better off. But unrest, suffering, and anxiety frequently accompany this trickle-down process. Many wonder if there is any justification for such an approach at all, and in the case of the least-developed, it is clearly least justifiable.

Those concerned with the least-developed have become rightly skeptical of this trickle-down approach. Three current alternative strategies seem attractive to national leaderships.

The first is to control the rates and processes of change. The rapid change of modernization is always accompanied by significant stress. If change also brings progress and improvement, stress may be suffered, even gladly. But where the poverty is extreme and the conventional development prospects are limited, there may be a case for slower change, one more preservative of cultural tradition. For example, such sentiments have been voiced by the leaderships of the mountainous Himalayan kingdoms.

Or conversely, a case may be made for employing in these countries the most advanced techniques. In the massive but thoughtful application of science and technology lies the hope for leap-frogging the severe environmental constraints to development. Thus, an Oklahoma-based firm of weather modifiers was recently employed in Niger to break the drought, and ways are sought to use the substantial ground water resources of the Chad basin to move directly towards a much more intensive agriculture.

TABLE I
COMMON GROUPS AND DISTINGUISHING
CHARACTERISTICS OF LEAST-DEVELOPED NATIONS

CHARACTERISTICS	SAHEL	W.AFR. COASTAL	E. AFRICA N.	E. AFRICA S.	E. CENTRAL AFR.	ASIAN MT.	ISLANDS
	<i>Cent. Afr. Rep.</i>	<i>Cameroon</i>	<i>Ethiopia</i>	<i>Kenya</i>	<i>Botswana</i>	<i>Afghanistan</i>	<i>Maldiv</i>
	<i>Chad</i>	<i>Dahomey</i>	<i>Somalia</i>	<i>Malagasy Rep.</i>	<i>Burundi</i>	<i>Bhutan</i>	<i>W. Samoa</i>
	<i>Mali</i>	<i>Gambia</i>	<i>Sudan</i>	<i>U. R. Tanza-</i>	<i>Lesotho</i>	<i>Burma</i>	
	<i>Mauritania</i>	<i>Guinea</i>		<i>nia</i>	<i>Malawi</i>	<i>Khmer Rep.</i>	
	<i>Niger</i>	<i>Haiti</i>			<i>Rwanda</i>	<i>Laos</i>	
	<i>Upper Volta</i>	<i>Sierra Leone</i>			<i>Swaziland</i>	<i>Nepal</i>	
	<i>Yeman Arab</i>	<i>Togo</i>			<i>Uganda</i>		
	<i>Rep.</i>						
Isolation from World Economic Network	x				x	x	x
Highly Dependent Export/Import Economy	x				x	x	x
Small Population and Limited Resource Base	x	x					x
Poor Internal Connectivity	x		x	x		x	x
Aridity	x		x	x			
Poor Soils or Soil Erosion	x	x			x	x	
Special Characteristics	Nomadic livestock economies	Separate small economies	Culture, contact and conflict	Significant tourism	Supply migrant workers for neighboring nations	Mountain-hill eco-systems	Absence of Internal capital sources

A third alternative is the Tanzanian approach—a combination of pragmatic self-reliance to mobilize the labors of its people, a program of socialist decentralization to involve them in planning and decision-making and a reorganization of education and manpower training to provide independence from the exclusive reliance on international aid, skills and personnel.

In the current grim realities of the world economic system, each of these alternatives has an utopian quality, complicated further by the obvious dependency status of some of the least-developed, whether with a powerful neighbor such as India (Bhutan), with an uncongenial one such as South Africa (Botswana and Lesotho), or with the former colonial power that still characterizes French influence in West Africa. Indeed, since the original U. N. designation of the least-developed, Sikkim, has been joined to its neighbor.

For the practitioners of development, the agencies that provide funds, the experts that plan activities and the administrative and technical people that implement them, the least-developed challenge whatever skills they have accumulated over the last two decades. A massive outpouring of aid in the conventional mode might only exacerbate the fears of thoughtful national leaderships; increase the dependence on foreign experts, goods and skills, accompanied by an intensification of inequality and stress of change; and introduce inappropriate technologies, the perverse effects of which will not be readily apparent. There is need, therefore, for alternative approaches towards improving the lives of people, their productivity and their security.

Alternative Development Approaches

Alternatives presently exist. They are sprinkled in with the conventional experience of development. They require selection, experimentation and encouragement. None of these are miracle fixes or green revolutions, but they offer promise of human betterment, selective use of environmental opportunity and long-term strengthening of the societal capacity to engage in development. And these approaches for dealing with such disparate issues as the productivity of pastoralism or with employment of school leavers share three common qualities: a focus on rural life in manageable units; integration of diverse resources, methods and goals; and the unconventional use of human resources and knowledge.

Focus on rural life

It was revealing to the planners of Tanzania that in their country where 95% of its people live in rural areas, 45% of the development budget went directly to urban areas and another 15% to serve inter-urban needs. The calculation in itself was radical, for most countries do not want to confront the implications of their investments. Alternative approaches focus on rural life where most people live and on manageable spatial units in which development activity can be responsive to the specificity of natural endowment and social order.

Integration of diverse resources, methods and goals

It has been reported in the current Sahelian drought that 40,000 cattle died around a single deep well that functioned perfectly, supplying fresh water to cattle dying of hunger for lack of grass—they and their herders having been attracted to the secure water-supply. Almost everywhere in the developing world, livestock developers are separate from water developers, rarely knowing each other's identity much less each other's activities. Alternative approaches seek to integrate resources, identifying environmental niches of complementarity in

Moreover, attempts to foster development in least-developed nations inevitably encounter conceptual difficulties associated with inadequately interrelated scales of human and environmental organization. For the climatologist, generalized global models form the basis of analysis and it is frequently difficult to relate theory to the practical problem of micro-environments. Similarly, users of small-scale resource units, as well as ecologists and ethnographers, possess detailed knowledge of areally limited zones but encounter problems in generating widespread applications.

Yet, both environmental units and human socio-political structures exhibit regular and orderly size relationships that are interrelated and interdependent. The most important of these are related to the varying scales of regional organizations and the different resource use techniques or life-styles for a given cultural setting. Small social groups function as resource users in micro-environments and are linked in nested fashion to other groups and to environmental complexes at progressively higher levels of integration. Formal knowledge about these relationships is greatest at the extreme ends of this continuum and weakest at the intermediate levels of 150-500 km^2 or 200-500 people.

An example may help illustrate these distinctions. It is drawn from the Humr, a well-studied group (Cunnison, 1966) of cattle-herding nomads that occupy the grassland areas of southwestern Kordofan Province in the central Sudan. In their migratory regime and mix of pastoral and agricultural activities, the Humr represent an example of multiple-resource use and of informed environmental awareness that is typical of indigenous cultures throughout the Sahelian-Sudanic groups of least-developed nations.

Figure 2 indicates along rows the types of resource-use activities now undertaken by the Humr or potentially available in the future. The varying, but regular, scales of regional organization, ranging from the dry-season well sites of extended families (15 km^2) through intermediate scales of tribal organization (150, 1,500 km^2) to the provincial level (15,000 km^2), are indicated in the columns. Plotting available knowledge in its formal, informal and folk states for each livelihood activity reveals interesting relationships. Formal scientific knowledge is concentrated at the broad provincial scale and seldom penetrates to lower levels of regional organization. Folk knowledge is greatest at the most intimate scale; informal knowledge tends to occupy the gap between scientific and folk information.

It is important to note that the figure does not suggest the relative strength of each type of knowledge at each scale, although it is clear that, while folk knowledge, for example, may be comprehensive and exhaustive in its understanding of local water sources, it may possess significantly less information about such activities as tree cropping or the market opportunities of urban areas. While the relative reliability of environmental data is not indicated, the differing approaches in the accumulation of resource information stand out clearly. Comprehensive resource surveys in Kordofan (and by extension in other parts of the area) shown in the last column integrate resource-use systems at the regional or province level but seldom affect the individual resource user. Project surveys (illustrated by the irrigation row) tend to deal only with the immediate system, invariably operate at small scales and seldom identify complementarities between different resource activities.

A change in perspective emphasizing intermediate organizational scales would suggest a different scheme to escape the shackles of vertical or horizontal analysis and to stress

a "diagonal" orientation that incorporates a number of activities at differing scales nested within one larger region. The simple initial example of such integration is indicated in Figure 2 (by the solid line) and can be made more complex by developing and stressing subsidiary linkages (dashed lines) to other complementary, but less immediately obvious, livelihood activities. Thus, Humr pastoralism might be upgraded by astute attention to cultivation activities along their migration routes and to backstop irrigation, as well as by altering pastoral pathways and perceptions by enhancing market opportunities, without destroying the essential fabric of nomadic life.

This focus on complementary activities at differing organizational scales is a crucial ingredient and should be a dominant concern in development projects in environmentally constrained marginal settings, since it is only by the combination of multiple options that security can be attained. That this principle is a sound one is evidenced by the behaviour of a wide range of groups in marginal environments. Eskimos in the Arctic exploit a variety of different aquatic and terrestrial resources while farmers in the Laurentians and Appalachians of eastern Canada mix dairying, maple sugaring, pig rearing and lumbering to support a satisfying way of life. Emphasis on development that integrates seasonal and spatial resource complementarity is a key feature of future development directions.

Technology for people's participation

Increasingly, self-reliance, both national and collective, becomes a major adjustment for poor nations. Mujwahuzi (1975) has analyzed the obstacles towards increased participation by the Tanzanian people in self-help development. In this case study, he uses a major national goal, improved access to rural water supplies,

Mujwahuzi finds a significant obstacle to mass participation in the government's reliance on what he calls the "conventional engineering approach." He is not unsympathetic to the technicians, indeed he notes that:

The conventional engineering approach is easier on the part of the technicians to implement because it is supported by experience and there is continuous research in how to improve on it. On the contrary very little is known about the participative approach and there is limited research going on in this field. Furthermore, conventional methods are, at least viewed by the water technicians as being more reliable and faster to implement. Very often water technicians point out that it would be risking failure if they have to rely on people's participation. (p. 10).

But he goes on to note that :

In spite of the fact that the conventional approach to rural water supply development appears to have many advantages, the 1991 target cannot be achieved by pursuing this approach simply because the country does not have the necessary funds or the required manpower. On the other hand, a combination of both the conventional and participative approaches appears to be a promising alternative for rural water development. If this is the case, in what way can people's participation in water development be effectively employed? There are many ways in which people can get involved in planning, construction and maintenance of their water projects. People's participation in planning, for example, can take the form of information generation about the water

resource followed by their own decision making. Participation in construction and maintenance is feasible if and when the technology used is simple, locally based and brings satisfactory results at low cost. (p.10-11).

He then analyzes the requirements for a feasible technology in terms of its cost, simplicity, and the availability of local materials and the ability to employ local labor and concludes that the water supply systems which appear to have a high potential for participation are: solar distillation, roof catchment, ground catchment, hand-dug wells and ponds, tanks and reservoirs. Such an analysis is widely applicable to most developing countries not merely the least-developed and has been elaborated in the work done by the International Development Research Center (1973).

However, Mujwahuzi extends the analysis to the specific needs of Tanzania:

In the case of Tanzania, because of the existing spatial variations in water resource endowment, not every system I have indicated as being suitable for popular participation can be developed everywhere in the country. Some systems are more suitable for certain areas and not for others. For example, whereas ground catchment systems may be developed successfully almost in every part of the country, roof catchment systems may be suitable for areas with high rainfall only. Thus the application of participation in the development of improved water supplies would have to be regionalized depending on the nature of the the water resource base.

The indigenous capacity to cope with natural hazard

A final example of geographic contribution comes from the international collaborative studies of natural hazard and disaster (White, 1974; Burton, Kates and White, forthcoming) that revealed how every livelihood system has a capacity to absorb hazard, a capacity paradoxically endangered by development and change. That capacity is particularly evident in the least-developed nations. While many of the poorest countries are but a decade old and a few are ancient kingdoms, all have been peopled for a long time, indeed they are the birthplace of humankind. To persist and to survive in a relatively unchanging and often harsh environment, their people have evolved by trial, error and experience considerable capacity to absorb extreme events and survive. Policies for dealing with drought, flood, cyclone and earthquake should begin with a thoughtful knowledge of these mechanisms of survival.

Such studies can indicate which of the traditional coping actions needs to be carefully preserved so as not to be inadvertently destroyed by development (e.g. elimination of food surpluses in the shift to cash cropping) and which can serve as inspiration for modernized systems (e.g. adapting the tradition of elevating structures in floodplains to concrete technology). But such study also serves to illuminate the special points of vulnerability in traditional systems when traditional responses may prove counterproductive and dangerous.

Johnson (1974) has described this sequence for the nomadic peoples of the Sahel as

During average conditions nomads experience drought seasonally when the dry season begins. The pressures represented by desiccating vegetation are experienced by nomads each year. In all cases the response is typical; seasonal water sources, usually

GROUPS OF LEAST DEVELOPED NATIONS

Derived from Principal Components Analysis

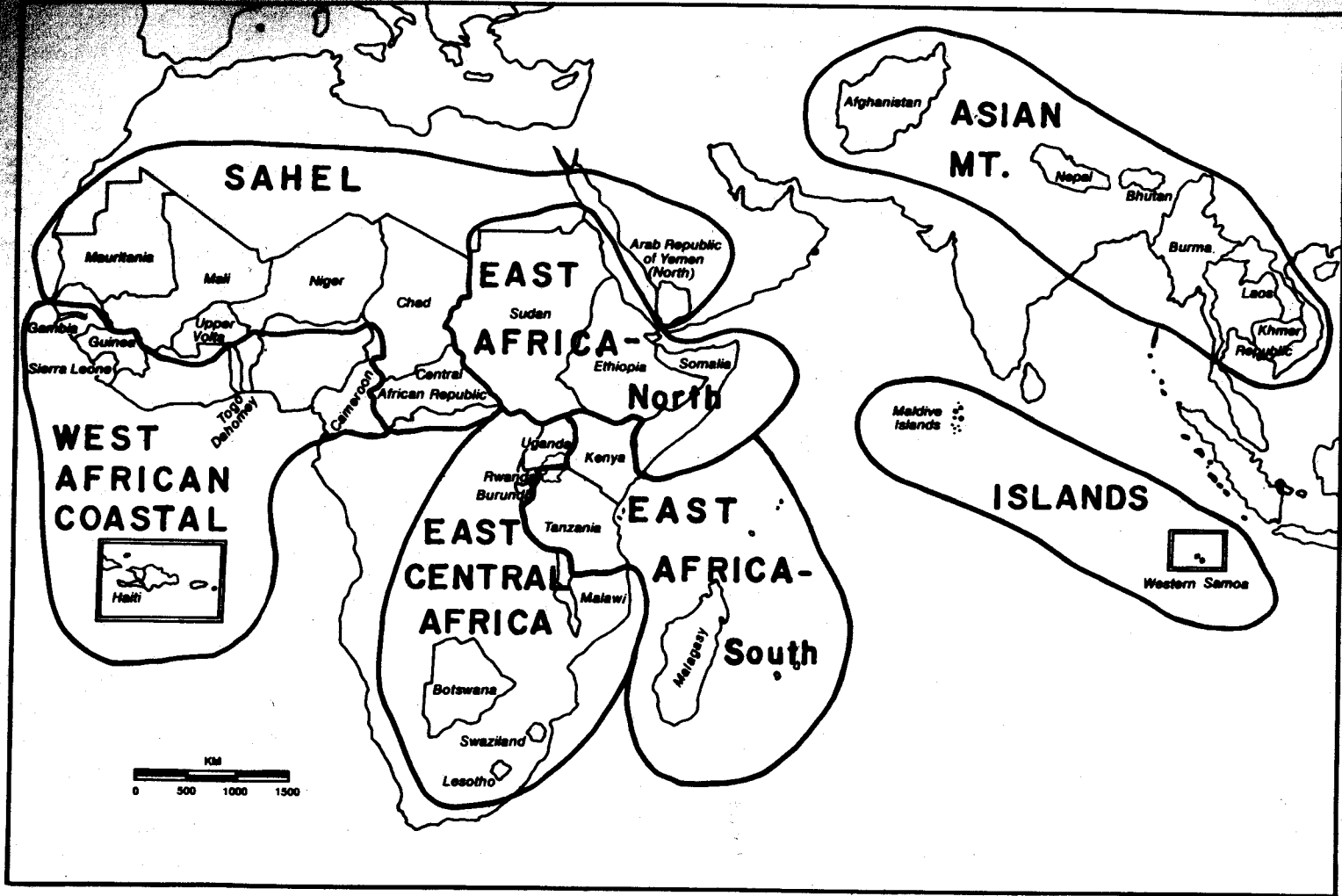
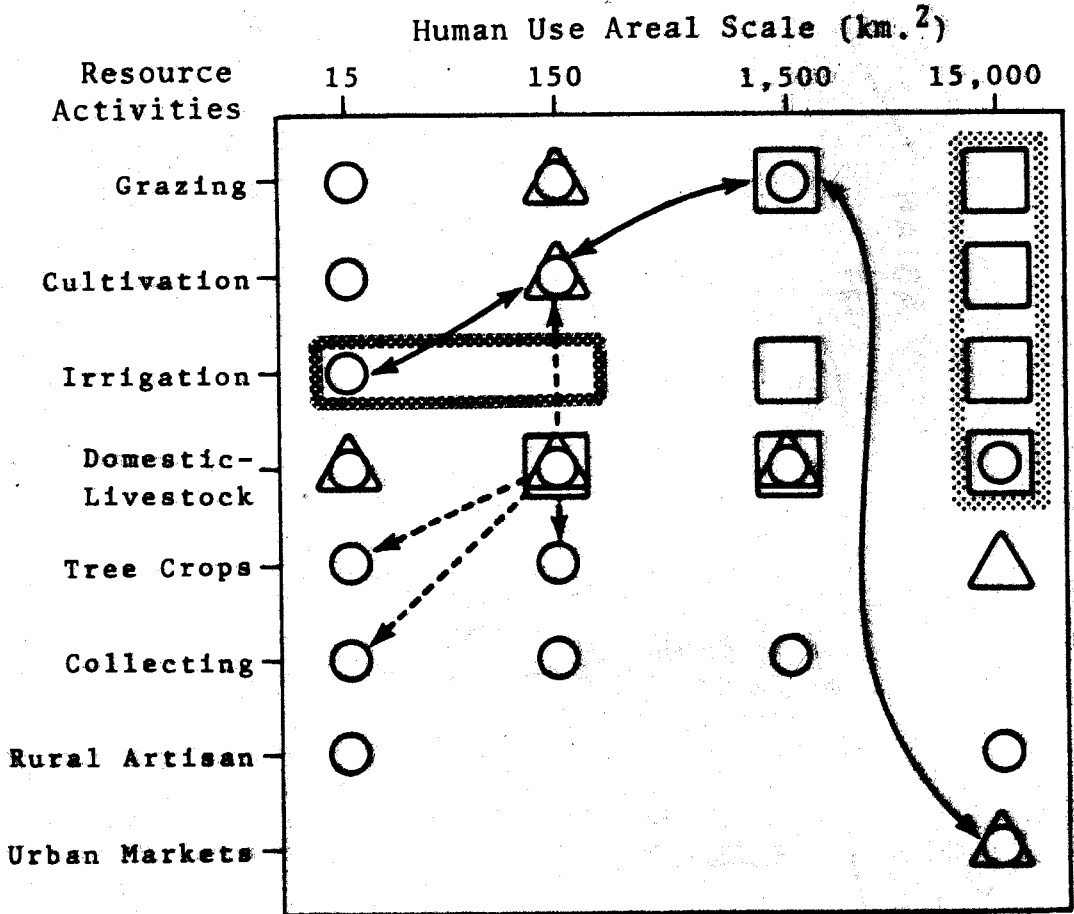


Figure 1

Figure 2
ENVIRONMENTAL KNOWLEDGE OF RESOURCE ACTIVITIES



- Folk knowledge
- △ Informal technological knowledge
- Formal scientific knowledge
- ◻ Resource survey approach
- ◻ Project survey approach
- ← Primary integrated development project approach
- ← Secondary integrating links

surface pools of rainwater, are abandoned and the herds are shifted to the tribe's permanent watering points. As aridity increases, the need to water stock frequently increases pressure on both available water and pasture resources adjacent to wells and upon animals and herders themselves.

The nomadic response to drought occurs when moisture conditions fail to reappear with their expected seasonal regularity. Less reliable water sources are gradually abandoned and concentration on a restricted array of permanent deep-water wells take place. The result is to concentrate a larger number of animals and herders in increasingly restricted areas within tribal homelands. The situation becomes even more acute when the restricted movement focuses on agricultural areas; where such resources are in the hands of an *in situ* sedentary population, high rents for limited pasture and water are charged. Obligations to assist needy kin add another dimension to the struggle for access to scarce resources and gross overcrowding can take place.

It is important to note that this process replicates the normal patterns and problems of concentration around permanent dry season water facilities..., although in exacerbated form. As a consequence, the initial response of restricted mobility constitutes a short-term risk minimization policy predicated upon short-term departures from average conditions. The danger inherent in being caught in such a posture, should conditions prove more extreme than expected, is considerable. Trapped by widespread, prolonged drought, the nomad may be unable to shift to an alternative response and may be condemned to watch first his herd and then his kin die.

Thus, with limited capacity to respond to disaster assistance, a poor country might be well advised to concentrate its efforts on helping its people *only* when their traditional responses become counterproductive. In the Sahelian case, Johnson and Vogel (1975) would suggest the establishment of a series of emergency escape routes from traditional areas. If deepening drought trap herds in their home bases with water but without pasture, truck-led convoys can lead the herds out of the trap. The trucks carry mobile pumps to be used with a system of drilled but capped wells and fenced forage depots. Similar approaches for government help to supplement but not replace indigenous responses can be developed for agricultural drought, flood and cyclone.

A Concluding Note

The foregoing are all examples of the ways in which geographers are contributing towards the development of alternative approaches. But much that is basic still baffles the scientists of environment and development and in particular, the geographical community. Despite all that has been written, the ultimate environmental imperatives in the use of these lands remain unknown. The long-term climatic trends that spell life or death for the semi-arid and monsoonal lands are still indecipherable, although an ominous trend to less rainfall has been noted by some. However, the critical equations of population, poverty and environmental constraints can still be stretched by leadership or ideology, by hope and aspiration. Thus while the least-developed are in some sense the least-known, it is not knowing what to do or how it ought to be done that faces 150,000,000 people with a desperate future of increasing relative and absolute deprivation. It is, in the last analysis, to be least in a world of the most.

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