

MAN'S PAST AND FUTURE IN ARID LANDS: AN ANTHROPOLOGICAL PERSPECTIVE

by

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To grow or not to grow? To encourage or discourage industrialization? To support large-scale irrigation projects or not? These and similar questions are crucial issues currently facing the citizens of arid lands not only in the United States but also in the Middle East and sub-Saharan Africa. Because the gravity of these issues demands that scientists and policy makers keep their field of vision as clear as possible, perhaps an anthropological outlook can assist in placing contemporary issues in the longer time perspective of man's different adaptations to arid conditions.



Theodore E. Downing
— Helga Teiwes (1976)

Early Adaptations

Food collecting has been man's most stable adaptation to arid lands. Either directly through human efforts, or indirectly through the use of animals, man has been a food collector, since over 90 percent of the several billion humans who have lived on this earth since the dawn of man have been hunters, herders, or food collectors.² More recently, that is within the past few thousand years, the agricultural revolutions forced the few remaining food collectors into the most marginal arid and tropical lands. Early anthropologists propagated the misimpression that these marginal peoples eke out their subsistence in a constant struggle for food.

We were wrong.

New evidence reveals that even with marginal environments, contemporary food collectors have considerable leisure.³ It has been found that primitive food collectors provide for *all* their subsistence needs working less than four hours a day! This primitive affluence is restricted by several conditions including a low standard of living, constant exposure to the elements, limited human wants, and an exceedingly low population density. Moreover, it requires constant moving from one area to another as the renewable resources are temporarily exhausted.

Farming, the second preindustrial adaptive strategy, primarily refers to the irrigation of floodplains in arid zones using surface waters. This adaptation increased man's affluence and allowed him a more sedentary life. Preindustrial irrigation has not been without difficulties, however, as salinity problems and waterlogging have helped lead several great civilizations into extinction in both the Old and New Worlds.⁴ These early arid land civilizations also faced an additional difficulty: the provision of fuel sources for the increased demands of pottery and metal work that accompanied the sedentary life made possible by irrigated agriculture. Mohenjo-Daro, an ancient city in southwestern Asia, found its immediate hinterlands increasingly deforested as demands for high-temperature kindling increased with the complexities of human material wants.⁵ Once one of the world's most advanced civilized cities, today it is an archaeological ruin. In the short run, man may reclaim the desert, but in the long run man himself is outdone.

Two factors appear to have held these early adaptations in check: a low transport efficiency (high cost to move goods) and low storage efficiency (high cost to store products). Both factors restrained the extent of man's search for food and energy to a limited range. This meant that preindustrial adaptations captured little energy outside their immediate surroundings and depended primarily on long distance trade in luxury goods. Arid zones in the preindustrial period, from the perspective of energy exchange, were (and a few still are) closed systems.

Industrial Adaptations

Industrialization was a temperate zone revolution requiring vast quantities of raw materials and energy. Its impact on arid lands was delayed for at least a century while energy was being tapped within the immediate hinterlands of industrialized regions. Transport and storage efficiency and the demand for arid zone energy sources were still too low to make their exploitation profitable. These inefficiencies and demands quickly changed with the invention of the railroad and internal combustion engine. As resources near the great industrial centers of Western Europe and the United States became limited and expensive, the expanding industrial areas stretched

1. Research Specialist, Bureau of Ethnic Research, and Assistant Professor of Anthropology, University of Arizona, Tucson.
2. Lee, R.B., and I. DeVore, eds. (1968). *Symposium on Man the Hunter*, University of Chicago, 1966. Aldine Publishing Co., Chicago. 415 p.
3. Lee, R.B. (1968). What hunters do for a living, or, How to make out on scarce resources. *Op. cit.*, p. 30-48.
Woodbury, J. (1968). An introduction to Hadza ecology. *Op. cit.*, p. 49-55.
Sahlins, M.D. (1972). *Stone Age economics*. Aldine-Atherton, Chicago. 348 p.
4. See articles by R. Adams, S. Neely, M. Gibson, and B. Spooner (1974) in T.E. Downing and M. Gibson, eds., *Irrigation's impact on society*. University of Arizona Press, Tucson, Anthropological Papers, No. 25. 181 p.
5. Whyte, R.O. (1961). Evolution of land use in south-Western Asia. In L. Dudley Stamp, ed., *A history of land use in arid regions*. UNESCO, Paris, *Arid Zone Research* 17:57-118.

VIVA LA CUCARACHA!

To be an animal is to be capable of ingenuity and of joy; of achieving beauty and of demonstrating affection. These are surely not small things, though there is danger that we are forgetting how far from small they are. They are godlike attributes whether or not there is anything else godlike in the universe. To be alive at all, even if only as an amoeba is alive, is to be endowed with characteristics possibly unique and certainly exceptional throughout that vast expanse of space which extends for billions of light years beyond us, farther than telescopes—and much farther than thought—can reach.

Joseph Wood Krutch
The Great Chain of Life
Houghton Mifflin Co., Boston, ©1957

Historically, man has been ambivalent in his relationships with animals. He has worshipped them, feared them, domesticated them, used and abused them, and now he is in a fair way to exterminating them.

It is somewhat of a tangled web in which desert-dwelling man has entrapped himself, needing animals as those in more temperate environments may not, to survive, as a source of food, to pull his plow, to turn his water wheel, to transport him and his household from place to place as he follows the seasons. With none of these needs do we find a conflict between our role as sentient beings and the uses we make of other sentient creatures. We justify the necessity to slaughter, shoot, club, harpoon, and in all other ways our imagination can devise to kill, because as human beings, we believe we need to eat meat to survive, millions of vegetarians — willing or unwilling — notwithstanding. We see nothing wrong, wicked, evil, or immoral in raising animals to satisfy this hunger. We do this deliberately, expertly, scientifically, whether we live in Arizona or in Kenya.

Animals alive are the index of many men's status in desert societies, or elsewhere for that matter. We equate a nomad's wealth with the number of camels he owns. [What manifestations of this status will be substituted when he is sedentarized?] We build our drought relief programs around the need to replace the desert pastoralist's decimated herd. [Do we help him understand the limitations of the drought-ravaged rangeland, when it is rehabilitated, so that its carrying capacity will be in balance with his animal assets?]

Well, let us not concern ourselves with these nagging problems. Others are worrying about such matters, great international organizations are assembling and preparing position papers to deal with these issues, and generous single governments are fielding expert teams to advise and assist.

So let us think about those other animals, the wildlife supposedly under no man's control. Well, who needs them? Take the kids to the zoo and let them see there the coyote, the Gila monster, the buffalo, the ferret — sorry about the carrier pigeon; or the oryx and the addax and the dama gazelle, far from the desert homeland in the Sudan where they are no longer to be seen in the wild. Who cares? Certainly not the greedy poacher who defies with impunity the feeble laws that do exist some places on paper. Certainly not the evil owner of that wretched U.S. roadside display of animals confined under unbelievable conditions of filth, hunger, thirst, and abuse. Certainly not those Texans celebrating their rattlesnake hunts. Certainly not the western sheepman who cries piteously when a coyote kills a lamb but who cheerfully sends thousands of lambs, if he has had a good year, to the slaughterhouse.

Who cares? Jeremy Swift cares, when he writes: “. . . It seems that the addax, a beautiful animal whose presence extends the boundaries of the habitable world into the heart of the world's harshest desert, is too exceptional an animal to be allowed to live, even in the deserted dunes for which it alone has been prepared by thousands of years of evolutionary hardship.” (*The Sahara*, Time-Life International, ©1975, p. 108.)

And we'll tell you who else cares: the mighty hunters of the world who kill pour le sport, killing for killing's sake, those rich potentates who do their hunting from the air, like gods, from helicopters and low-flying aircraft, guns blazing as they race the impalas across the desert landscape. Is it possible that such human beings — and I use the word human advisedly — can indulge in the exquisitely cruel and senseless ways that he now commands as his authority over the world's diminishing wildlife, and not in the indulgence thereof be diminished himself? We think not.

And can governments which continue to issue licenses to big game hunters, themselves willing victims of professional hunting firms, when all the evidence already in dictates that the species for which the license is issued will soon be extinct — can such governments command the respect of the world community? Can the insignificant income from such activities really mean the difference between survival of a country and non-survival? We think not.

Has the technological cruelty that we have cleverly invented protect *any* of us from the extinction that we have brought about for our fellow creatures? When the deserts' wildlife is gone — pour le sport, or indeed for food — will the deserts be more useful for man's needs, much less his enjoyment? We think not.

In the twentieth century, our increasing contempt for life, initiated by our overwhelming capacity to destroy life, is bringing closer the day when our world will be despoiled and plundered irrevocably. Today the impala, tomorrow the desert world's wretched humans. What difference?

So we say angrily and bitterly, without apology, viva la cucaracha!

— Patricia Paylore

giant umbilical cords—rails, highways, and pipelines—into arid zones. The age of extraction began.

The extraction adaption consisted of transferring energy, resources, and materials from arid zones to temperate areas for industrial use. This adaptation produced social patterns distinct from the preindustrial adaptations of food collecting and irrigated agriculture. A new type of society emerged, the one-company town, primarily based on the exploitation of mineral deposits, and characterized by a single company which controls most of the social, economic, and political power in those settlements heavily dependent on an extractive economy. The company's powers might include control of banking, transportation, schools, churches, libraries, health care, and commercial stores. In the United States, this economic dependency led Dr. Courtney Cleland to observe that "southwestern man meshes with the national economy of abundance, not with the regional economy of aridity."⁶ In nations whose territory was confined entirely to arid zones, this economic dependency has led to economic, social, and sometimes political intervention by nonarid powers into the arid nation's internal affairs.

Other social patterns are common to the extractive phase, including short-lived boom towns, highly mobile populations, and the destruction or marginalization of native peoples who previously inhabited the regions. In sectors of arid zones suitable for large scale irrigation, heavy capital outlays have brought the development of a new style of irrigation farming based on large scale farms employing seasonal labor. The tapping of groundwater resources has permitted an earlier subtype of food collection adaptation, nomadic herding, to increase to levels adequate to make vegetation rather than water the key limiting resource on herd size.

Intra-zonal energy demands increased greatly, but most of the flow of resources and energy was for export to nonarid lands. Arid zones acquired a reputation for being lands of hidden wealth. As Antione de Saint Exupery's infamous *Little Prince* suggests, "What makes the desert beautiful . . . is that somewhere it hides a well." Man's demands on arid lands were strongly influenced by a perspective and ideals based upon temperate zone experiences, including what constituted a "good" society for arid lands. Under this moral scheme, the instability of settlement and the sensitivity of intra-arid developments to extra-arid zones were considered the antithesis of a good society. The ideal was expressed by desires for another form of social adaptation.

This new social ideal emerged, based on the philosophy of "self-sufficient adaptation." Arid man began his search for a viable, socio-political and economic organization that would be less dependent upon the instabilities inherent in an extraction-based economy. On the ground, this idealism meant building permanent settlements based upon agriculture, industry, trade, and in some cases, tourism.

The belief in the possibility of self-sufficient adaptation for all arid lands was strengthened by a handful of success stories: the southwestern United States, Israel, and Kuwait. These cases, however, were oddities brought about by an enormous influx of capital generated either in nonarid sectors within the country, or resulting from a favorable balance of payments whose ultimate sources were the extractive industries. Following the second World War, the optimism for self-sufficiency was further stimulated by the emergence of an international community of scientists and engineers interested in arid lands development. More than one arid lands scientist has felt that the arid zones have begun to "shake off the shackles of the extractive economy."

The lesson from the past, however, suggests that an epitaph for extractive adaptation to arid zones may be premature. This lesson has been that the social future of arid lands is heavily dependent on outside factors. Discovering the future social and economic patterns of arid zones should begin with a consideration of what future demands placed on them by the rest of the world will be.

Arid Lands in World Perspective

It is becoming increasingly clear that world demands for food and nonrenewable energy will create greater and greater extractive demands on arid lands.⁷ Arid lands (and humid tropical lands) will be asked not only to feed and fuel themselves, but also to assume part of the burden for the rest of the world. The future relationship between nonarid and arid powers may become one of parasitism, with arid lands being *the host*, rather than symbiosis some had hoped for.

Above all, the exact demand for arid zone resources by the nonarid world depends on how the consumers of energy in nonarid zones solve their own technological and social problems so that they need not depend on arid zone sources. The demand will also depend on technological innovations developed by arid land scientists and engineers. Many of these future technological developments, such as low-cost solar refrigeration, transportation, and electricity, might serve only to improve the abilities of nonarid zone people to extract energy from arid regions. Such innovations may prove to be technological demons to those engineers and scientists whose goal is to improve the self-sufficiency of arid lands. On the other hand, these innovations may be viewed as blessings which drastically increase employment in the extractive industries. Whichever perspective is taken, the futures of Arizona, New Mexico, Saudi Arabia, and Libya are inexorably linked to decisions of consumers in New York, Illinois, Japan, and Germany.

6. Cleland, C. (1966). Do we need a sociology of arid regions? In J.W. Bennett, ed., *Social research in moisture-deficient regions*. American Association for the Advancement of Science, Southwestern and Rocky Mountain Division, CODAZR Contribution 9, p. 9.

7. Meadows, D.H., et al. (1972). *The limits to growth*. A report for the Club of Rome's project on the predicament of mankind. Universe Books, N.Y. 205 p.

The overall pattern seems clear. Arid lands have moved from an early condition of self-sufficiency into increasing dependence on nonarid regions. This trend is reversing, and now arid regions are becoming increasingly crucial to the world's future demands for food and energy. The goal of self-sufficiency for arid regions stressed by some planners and implied in technological schemes is coming into direct conflict

with world demands for their energy and resources. What appears important is that each technological scheme, each innovation, and each opportunity should be carefully evaluated not only as to its ecological and economic impact on arid lands, but also as to its long range social impact on those who call an arid land home.



WEST AFRICA CONFERENCE

The University of Arizona, under the auspices of the Arid/Semi-Arid Natural Resources Program and the Ghanaian Council for Scientific and Industrial Research (CSIR), cosponsored a West Africa Conference in Tucson in April 1976, to discuss problems of natural resources development and management in the countries of West Africa, and their related social, economic, and political constraints. While the Sahel region has been experiencing severe drought conditions that have disrupted traditional demographic patterns and regional economies, other countries in the semi-arid tropics have also begun to be affected. Topics discussed included historical perspectives, the use of natural resources, increasing population, agricultural practices, physical geography, and land degradation.

Visitors to this conference from out of country included:

K.B. ASANTE, Ghanaian Ambassador to Belgium.

Albert BALIMA, Economic Counsellor to the President, Ouagadougou, Upper Volta.

Albert BARON, Regional Development Officer, AID, Niamey, Niger.

John BUURSINK, Project Manager, Interafrican Committee for Hydraulic Studies, Ouagadougou, Upper Volta.

Neil CARPENTER, Chief of Farm Management, Agricultural Services Division, FAO-Rome.

Robert DODOO, Secretary, Planning and Analysis Group, Council for Scientific and Industrial Research, Accra, Ghana.

Kobena Gyapea ERBYNN, Department of Economics, University of Ghana, Legon/Accra.

R.J. HARRISON-CHURCH, Department of Geography, London School of Economics.

Samuel E. QUARM, Ghanaian Ambassador to the United States.

A.N. TACKIE, Executive Chairman, Council for Scientific and Industrial Research, Accra.

T. YAGUIBOU, Upper Voltan Ambassador to the United States.

ARID LANDS RESEARCH INSTITUTIONS: A New Edition

The University of Arizona is pleased to announce that the Office of Arid Lands Studies is undertaking a completely revised and enlarged edition of its 1967 directory of arid zone research institutions. Instructions are going out worldwide for submission of entries for this new version, but *Arid Lands Newsletter* takes this opportunity to urge all those agencies not represented in the original edition to communicate with the Office of Arid Lands Studies before December 1, 1976, to insure consideration for inclusion.