



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

AUTHORITY SYSTEMS, ENTITLEMENTS, AND  
LOCAL-LEVEL RESOURCE MANAGEMENT

Daniel W. Bromley

Department of Agricultural Economics

University of Wisconsin 97

Madison

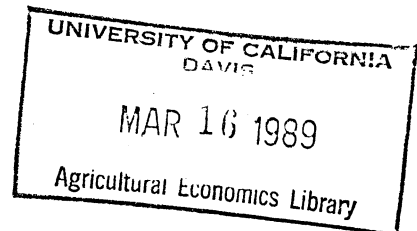
and

Bruce A. Larson

Resources and Technology Division

Economic Research Service

Washington, D.C.



Presented by Bruce A. Larson at the annual meetings of the American  
Agricultural Economics Association, Symposium on Incorporating Environmental  
Measures into Third World Development Lending. Knoxville, TN. August, 1988.

1988

Rural government

AUTHORITY SYSTEMS, ENTITLEMENTS, AND  
LOCAL-LEVEL RESOURCE MANAGEMENT

Economists have, for some time now, understood that the legal environment is important for determining the way in which natural resources are used and managed. Implicit in much of the attention to the nature and extent of property rights over natural resources is the assumption that organizations exist to ensure compliance with prevailing institutional arrangements (both conventions and entitlements). Our task here is to augment the usual treatment of property rights and natural resources by introducing as an explicit aspect the systems of authority that are required in order that conventions and entitlements (institutions) have their intended effect.

The presumption of this paper is that resource degradation in the developing countries--but especially at the local level--occurs for two related reasons: (1) unclear institutional arrangements (property rights); and (2) a breakdown in the authority systems that ensure compliance with those very institutional arrangements. In the absence of authority, no convention or entitlement has any meaning if an economic agent chooses to contravene the institution. We suggest that the development community will not be successful in addressing resource degradation at the local level so long as these authority systems are ignored in policy formulation, and in donor assistance programs. Our purpose here will be, therefore, to present

two hypotheses: (1) the rural village is an authority system whose legitimacy was undermined by colonial administration; and (2) differing communities of interest in development assistance make it difficult to reestablish the authority systems so necessary to halting resource degradation at the local level. By implication we suggest that a necessary condition for successful resource development in the Third World remains the prior development and/or enhancement of village-level institutional arrangements.

### I. THE RURAL VILLAGE AS AN AUTHORITY SYSTEM

The essence of village life is a structure of authority and control, encompassing both permission and restraint, within which all human endeavor operates. Extant status and authority systems are intended to leave few in doubt as to their domain of choice in a number of private and public affairs. Whether explicit--as the caste system in India--or implicit, residents of a village are supposed to know within certain latitude, who may do what, and where it may be done. Indeed, the very purpose of a village is as a locus of control and cooperation such that the welfare of the group will be enhanced. If villages did not serve this purpose we would not observe them; rather, individuals would live in scattered arrangements with no apparent purpose or pattern. The village is, therefore, an economic and social artifact of great significance to the use and management of natural resources in the Third World.<sup>1</sup>

---

<sup>1</sup>The term "village" is used to denote a group that uses a set of shared resources, and may include sedentary agricultural communities or nomadic pastoral groups. The possibility of coercion or economic oppression within

But, the effectiveness of any particular village as an authority system is critically dependent upon its ability to exercise authority over the actions of the members of the community.<sup>2</sup> Part of the role of a village is to mobilize internal resources in its own defense against external forces. In early days those external forces were military in nature. With the rise of the modern nation-state, the military threat has been replaced by the ever-present economic buffeting of national policy and political priorities. The village still serves the center, less with warriors for defense of the realm--or for foreign incursions--but more with the supply of raw materials, labor, and agricultural products.

Prior to colonialism, village autonomy varied across locations and with the concentration of power at the center. In areas of stronger central power, such as south and southeast Asia, ruling monarchs/leaders exercised considerable control over the political and economic life of villages. In areas with less central power, the village retained greater autonomy over the local political and economic life. In either case, villages served the interests of the center but maintained considerable control over the day to day management of local resources. It needs to be reemphasized that villages were not usually homogeneous communal groups where all members had equal standing and equal access to resources; distinctions were drawn

---

a village are not ruled out.

<sup>2</sup>For example, consider a property right, which is a claim on something of value that a party can expect to be enforced by some authority. Without a system of authority to enforce the claim, there is no secure expectation and, therefore, there is no property right (open access).

between slaves, families, men and women, and village heads.<sup>3</sup>

Villages were not only suppliers of necessities, but local outposts of control and authority over scattered peoples in the hinterland. Hierarchies of villages represented the flow of economic goods and services up to the center of the political unit, and as receptors back down of political and economic control. The political legitimacy of the ruling entity was secured through the extension of representatives down through the political structure of regional town, and ultimately, rural village. In the ideal system, while the center did not necessarily dictate local activity, no economic or political act occurred at the village level whose purpose was other than to secure the blessings of the ruler of the polity of which the village was a part. We might, in contemporary terms, regard villages in this context as the analogue of divisions of a large complex corporation.

When the developing countries were colonized by European powers, and there are few countries in Asia and Africa that were not colonized, one of the problems of colonial administration was to harness the political power of the villages to secure legitimacy for colonial administration. This was accomplished, in the main, by undermining existing authority systems responsive to the pre-colonial rulers, and supplanting them with authority systems that would be responsive to the interests and imperatives of the colonial administration. In Africa, large tracts of land were legally (and conveniently) defined as vacant by the colonial powers. This land classification dissolved or at least increased uncertainty in the existing

---

<sup>3</sup>For example, in Africa it was common for village lands to be allocated to families for their individual use. While "village families" often had the right to transfer lands to heirs, newer members of the group--stranger families--usually did not [Noronha 1985].

authority systems that in reality controlled the "vacant" lands by a variety of indigenous tenure systems. These land were then either offered to settlers and concessionaires or delegated as native areas. In the British colonies of Africa, tribal chiefs were then appointed as agents of the colonial administration to administer the native areas. The utilization of chiefs facilitated colonial administration, but did not necessarily reflect their actual place in society. In pre-colonial times, "tribal chief" was a loose description of leadership with a wide range of attributes and powers. But, the new colonial administrations empowered their appointed chiefs to mobilize village resources for tax collection, procure labor for colonial projects, and supply food to feed laborers and the military.<sup>4</sup> French administrative philosophy, while originally based on direct rule, eventually also gave way to the appointment of local chiefs, and then ex army personnel as agents of the colonial administration.

While the colonial powers may have been able to usurp the existing systems of authority that controlled village resources, they were not uniformly successful at imposing new systems of authority. For example, attempts by the British in the 1930's to grant monopsony power to gum arabic merchants failed because no system of authority existed that could require the farmers to produce gum arabic and deliver it to the merchants [Egboh 1969]. Rather than producing gum at a loss, the farmers cut the trees for firewood and to increase cropland. Thus, without the necessary system of authority to ensure compliance, the value of the monopsony concession was effectively zero.

---

<sup>4</sup>Hopkins [1986] writes that "tribal" loyalties and traditional authorities were invented where they could no longer be found.

Once colonialism gave way to national independence, prevailing systems of authority at the village level were once again in need of modification and realignment with the new imperatives and interests of a national government. Nepal attempted to nationalize all forest lands; Tanzania adopted socialism and ujamaa; Cameroon initially emphasized the importance of customary law but then increased state control; Botswana created Land Boards to control land allocation that was formerly the domain of customary authorities; Kenya continued a policy of individualization of land tenure that excluded the possibility of group ownership, but later amended the policy to allow group registration of land. The changes and disruptions during and after independence to local-level control destroyed, yet again, existing relationships of power, influence, and authority that evolved before and during the colonial period.

The independent governments were and continue to be in need of financial resources to meet their new national objectives. Since the colonial powers often left little in the form of infrastructure or industry, agriculture and natural resources remained the main sources of exports and government revenues. The independent governments continue to depend on rural villages to supply labor, raw materials, and agricultural products to provide resources to finance the government and meet development objectives.

During these eras of destruction, creation, and modification of local-level systems of authority and control over daily life, populations were expanding rapidly, and technology was altering the way in which people used --and interacted with--their environment. Wells were dug, vaccines were introduced, and tractors were imported. At the very time when the ability to control individual behavior at the village level was at its lowest,



populations were expanding and the pressure on the natural resource base was accelerating. Degradation of natural resources was the predictable outcome. In Nigeria in 1914, a forestry officer noted that large tracts of Acacia senegal forests were being cut for firewood and the clearing of land for agriculture [Egboh 1969]. In Sudan, a commission was established in 1942 to study the issues of desertification and desert encroachment. The continuing problems of resource degradation in the Third World are well known [Allen and Barnes 1985; The World Bank 1985; Eckholm and Brown 1977; Ruddle and Manshard 1981].

Development assistance efforts will invariably target project resources at the village level, whether in the form of village forestry, pasture and fishery management, soil conservation and tree planting on family farms, or across-village irrigation projects. To the extent that villages today have lost their ability to exercise control over the actions of their residents and to the extent that no other system of authority is in place, then development assistance projects targeted to the public domain lands seem destined to fail.<sup>5</sup> To understand the continuing problem of an authority vacuum at the village level and the implications that this vacuum has for resource development, it seems fitting to explore first the various communities of interest in development.

---

<sup>5</sup> We will use the term "public domain" here as shorthand for all of those lands held in other than freehold (fee simple). The conventional view is that approximately one-half of India is uncultivated--and hence public domain land [Bentley, 1984]. Projects designed to register land are considered here to be a form of "assistance" directed at the public domain.

## II. THE DIFFERING COMMUNITIES OF INTEREST IN DEVELOPMENT

Four different communities of interest bear on the success of development assistance directed at natural resource projects. These communities of interest are: (1) donors; (2) recipient governments; (3) local elites; and (4) the village poor. The interests of the donor community are several, but prominent among them is the need to develop projects of potential benefit to the recipient national government. Donor agencies will usually seek to increase their project lending as an indication of their popularity and legitimacy in the developing world. The interests of the donors are also derived from their respective constituents. For example, the U.S. Congress, which allocates resources to the international lending community, is pressing these same institutions to incorporate environmental issues into their lending programs.

The interests of the national government will often be to attract a considerable portion of foreign assistance. The more contact government officials have with a donor--but especially with a multilateral donor--the greater the opportunity for foreign travel, and, best of all, foreign postings with the attendant income and status that follows. In the other direction, an official's rank and status within his own government will often depend upon the scope and nature of the foreign-assistance program in a country. Turning inward, national governments stand to benefit from being able to dispense public-works budgets to the hinterlands. Such largess creates loyalty and obeisance to the center, commodities always in great demand by central governments. Food aid in Ethiopia and Sudan are prime examples where both the governments and rebels have attempted to control the

flow of food aid to gain the support of the local populations. Within a government, there are often several ministries that have overlapping, and possibly competitive, responsibilities for the management of natural resources.<sup>6</sup>

Next we have the interests represented by the local elites, whose current wealth and status is often a direct result of family privilege acquired during the colonial period. It is axiomatic that local elites will either use external interventions by donor agencies and/or the donor community (projects) to increase their status and wealth, or be uninterested in having their position of influence undermined by such interventions. We must expect that these individuals--whether large landowners or persons holding high position by other means--will exert an important degree of control over the nature of the local intervention. More importantly, they will largely determine the eventual success and the distribution of benefits of local resource-enhancing projects.

Finally there is the local poor who, more than anyone, must depend upon the local resource base for survival. The elites are more likely to have land and/or income sources under their own control; the village poor will usually have to scavenge for fuelwood, livestock forage and fodder, and dung from the degraded public domain lands that are our concern here. These lands are significant in size and importance for the people who must depend upon them for survival. Recent official estimates place the standing forest cover of India at 72 million hectares (22 percent of the total land area), but the actual figure is said to be closer to 23 million hectares--or 7

---

<sup>6</sup>Systematic patterns of corruption, whether rent-seeking or defrauding, may also exist. See Wade [1985] and Jagannathan [1986].

percent. Whichever figure is the correct one, lands that were formerly forested are part of the public domain of interest here. Degradation over the past century has reduced forest cover from an estimated 40 percent of what was British India [Commander, 1986]. Other accounts from sub-Saharan Africa, South America, and Asia tell similar stories; forests are disappearing in countries where agriculture is still predominately based on shifting cultivation, as well as in those where agriculture is based on more permanent cultivation [Allen and Barnes 1985]. The pastoral/nomads of sub-Saharan Africa are well-known users of lands at the extensive economic margin, but others are equally dependent upon the public domain. Recent work by Jodha in India indicates that for 21 (dry tropical) districts over 7 states, between 84 and 100 percent of the poor households relied on public domain lands for "...food, fuel, fodder, and fibre items" [Jodha, 1986, p. 1172]. Between 10 and 24 percent of the richer households in his study areas made use of the public domain for pond silt to enrich their fields, and for timber. But it is the village poor who most depend upon these degraded lands, and it is they who face a continual threat from the village elite.

### III. THE IMPLICATIONS FOR RESOURCE DEVELOPMENT

The donor community has recently become concerned with social forestry efforts, with livestock and range problems in sub-Saharan Africa, and with resource degradation in general. A number of projects have been implemented and while there have been some successes, most would agree that the failure

rate is much too high to justify a continuation of past efforts.<sup>7</sup> That is, we now recognize that "institutional considerations" often spell the difference between project success and failure.

What are these "institutional considerations"? There is an increasing awareness that local institutions, most notably land tenure, are a fundamental part of resource development and improvement projects [Bruce and Noronha 1985; Brokensha and Castro 1984; Noronha 1985; Green 1987; Thomson 1985; Raintree 1985]. However, we suggest that the fundamental consideration is the institutional arrangements at the local level that determine the compliance system within which all villagers operate. A sociologist would refer to the "normative system"; an economist would be concerned with compliance. When social forestry is undertaken, compliance assures that the offtake will be consistent with the sustainable yield of the new plantings. When livestock projects are implemented, compliance assures that water points will be managed wisely and that forage will not be overused. When land registration is pursued, compliance assures that the individual can expect that others will recognize and accept the rules associated with land registration. Compliance comes from the recognition among members of a village that certain behavior is expected of them and that they will conform to those expectations. In game theory, it is the ability to minimize free-riding behavior among members of a group and solve the assurance problem [Sen 1967; Runge 1981].

Our position here is that the breakdown of authority systems that can

---

<sup>7</sup>For example, many projects have attempted to restock trees in the Sahel. The United Nations Sudano-Sahelian Office reports that several thousands of hectares of acacia reforestation during the past 25 years in Chad, Mauritania, Senegal, and Sudan have disappeared little by little [UNSO 1983].

ensure sustainable compliance at the village level dooms most resource improvement projects. The compliance system is a result of prevailing institutional arrangements and the system of authority that ensure compliance. It is this breakdown of a system of authority, which creates a divergence between accepted norms (conventions and entitlements) and the application of these rules in practice, that leads to unintended and undesirable effects of resource development projects. The failure of village institutions to exercise control over residents implies that those with power use resource development projects to their best advantage, which does not necessarily coincide with the objectives of the projects. Social forestry projects in central India have been plagued by this problem; we suspect that this is true in other areas as well.

Local as well as urban elites are often cited as using resource development projects to increase their control of resources and wealth at the expense of the village poor [Cernea 1985; Green 1986; Noronha 1985]. Indeed, Jodha's research indicates that public domain lands in India have shrunk by 26-63 percent over the past thirty years, and that between 49-86 percent of these privatized lands ended up under the control of the better-off segments of society. Cernea [1985] describes the effects of the pilot forestry program for the Azad Kashmir Hill Farming Technical Development Project in Pakistan. While the pilot project was intended to establish village woodlots to reduce deforestation by increasing the local fuelwood supply, wealthy farmers who in effect controlled large areas of "village" lands took advantage of the project to get their lands planted for free and to gain control over new lands. In turn, the further marginalization of the village poor increases the pressure on the remaining village lands. Cernea

[1985] concludes that the failure of this project was due to the lack of a social structure to sustain community forestry.

Obviously, not all resource development projects will be targeted to the public domain lands. In part due to problems experienced with village-level resource projects, reforestation efforts have shifted to farm forestry or agroforestry [Cernea 1985]. It is currently expected that the majority of new fuelwood planted will take place on farmland controlled by individuals or families [Spears and Ayensu 1984]. The emphasis on resource use at the family-farm level coincided with an emerging perspective that land registration, with the expectation of greater security of tenure, would provide the incentives to invest in land by planting trees and to reduce land degradation in general. In effect, the objective of land registration is to place the individual or some within village group such as a family in control of the land. With this new locus of control, the village is also replaced by the state and its legislative institutions as the new system of authority. However, land registration does not necessarily imply that the new system of authority will be adequate to provide the desired outcomes of the registration process. In Kenya for example, inaccurate land registers, illicit land transfers and subdivision, and increasing quantities of land disputes suggest that the lack of an authority system to ensure compliance can occur whether resources are individually registered or part of the public domain.<sup>8</sup> And again, local elites, wealthy urbanites, and merchants have used the registration process to gain control over areas of land previously controlled at the village level. [Green 1987; Noronha 1985].

---

<sup>8</sup>Green [1987] reviews the literature on the effects of individualization of tenure and the registration of title in Kenya.

The process of changing institutions (land tenure) is not necessarily environmentally gentle; the very process of privatization has been an impetus for resource degradation [Jodha, 1986; Southgate, et al. 1984]. It seems to be easier to create uncertainty with respect to the existing institutions than put in place a new system of authority that leads to the desired outcomes. The window between creating uncertainty in the old system and the successful implementation of a new system may essentially produce a situation of open access to the use of the resource, with the accompanying incentives for its misuse.

#### IV. CONCLUSION

Our position is that the breakdown of authority systems that can ensure sustainable compliance at the village level dooms most resource improvement projects. Moreover, the donor community is doing little to reestablish those authority systems. In effect, land registration is explicitly designed to reduce the role of the village as a system of authority. The more recent attempts to involve local populations within the project design and planning stage are a beginning step to help build the local-village system of authority. For example, the goal of the village discussion in Nepal is to encourage the commitment of village groups in the implementation and management of projects. Our emphasis on the village as an authority system does not necessarily imply that all projects must focus on the entire village. Groups within a village, such as women's organizations in Kenya and landless farmers in West Bengal, have been successfully used in resource management [Cernea 1985]. But for these groups to be effective, they must



have legitimately recognized authority to control resources.

Indeed, it is not at all clear that national governments are interested in establishing the sort of authority system at the village level that would assure the success of resource development projects, with success often being characterized as some level of sustainable use. Sustained resource use implies that well-subsidized cattle ranchers could no longer deforest land to take advantage of rising international prices [Meyers 1981], or that logging operations could not clear cut tropical forests and then abandon the land [Walker 1985]. Sustained use of resources at the local level could, initially at least, imply higher domestic food prices, higher domestic energy prices, less export revenue and, therefore, less government tax revenue. This makes the job of the donor community difficult indeed. We must work at the national level to emphasize the importance of village-based authority systems, yet assure the center that such autonomy does not jeopardize national prerogatives. More importantly, we must work at the local level to mediate between the elites and the village poor to make sure that elites do not undermine resource development efforts, and that they do not perceive such projects as a threat to their influence. The hard part is, of course, that such projects may in fact do just that.

In the beginning of this paper, we suggested that a necessary condition for successful resource development in the Third World remains the prior development and/or enhancement of village-level institutional arrangements. While a well defined system of authority is necessary, it must also be recognized that it is not sufficient to ensure sustained use of the resource base. Potentially optimal resource depletion in a world of well-defined authority systems is not unique to any resource but follows, instead, from

the time-rate-of-use problem of the resource users [Cropper, Lee, and Pannu 1979; Dasgupta and Heal 1974]. This also raises the issue of whether in any specific situation resource degradation is driven by institutional problems, and therefore an institutional fix should be sought, or if resource degradation is an optimal response given the state of the world. For example, Perrings [1987] develops a model where agricultural production to maintain subsistence consumption drives resource degradation in the absence of property rights problems. Larson and Bromley [1988] develop a dynamic model of the agricultural household and show that there are no a priori reasons to believe that any specific distribution of property rights is uniformly better, in the sense that the household places greater value on its environmental assets--soil productivity and trees--for all periods.

Although better incentives to promote sustainable resource use are often suggested, given the heterogeneity of the world and the paucity of data, there seems to be little agreement on just what these incentives may be.<sup>9</sup> As T.W. Schultz [1980] emphasized in the Nobel lecture:

Most of the people in the world are poor, so if we knew the economics of being poor we would know much of the economics that really matters. Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture, we would know much of the economics of being poor [p.639].

Since resource degradation is often directly related to subsistence agriculture, more emphasis on the economics of agriculture in fragile ecosystems is necessary to understand the incentives for resource degradation and to reduce the unintended side effects of resource development projects.

---

<sup>9</sup>French [1985] raises the possibility that the incentives to stop deforestation, at least in Malawi, may not exist.

## REFERENCES

- Allen, J.C. and D.F. Barnes, "The Causes of Deforestation in Developing Countries." *Annals of the Association of American Geographers*. 75(1985): 163-184.
- Anderson, D., *The Economics of Afforestation: A Case Study in Africa*. Baltimore: The John Hopkins University Press. 1987
- Bronkensha, D. and A.P. Castro, "Fuelwood, Agro-Forestry, and Natural Resource Management: The Development Significance of Land Tenure and Other Resource Management/Utilization Systems". Prepared for AID/PPC/PDPR. April, 1984.
- Bentley, W., *The Uncultivated Half of India: Problems and Possible Solutions*. New Delhi, India: Ford Foundation, 1984.
- Bromley, D. W., "Natural Resources and Agricultural Development in the Tropics: Is Conflict Inevitable?" in: *Agriculture in a Turbulent World Economy*, ed. by Allen Maunder and Ulf Renborg (Oxford: Gower, 1986), pp. 319-27.
- Bromley, D.W. and D.P. Chapagain, "The Village Against the Center: Resource Depletion in South Asia." *American Journal of Agricultural Economics*. 66(1984): 868-873.
- Bruce, J.W. and R. Noronha, "Land Tenure Issues in the Forestry and Agroforestry Project Contexts". Land Tenure Center. University of Wisconsin, Madison. Madison, WI. 1985.
- Cernea, M.M., "Units of Social Organization Sustaining Alternative Forestry Development Strategies". The World Bank. Washington, D.C., February 1985.
- Commander, S., "Managing Indian Forests: A Case for the Reform of Property Rights". *Development Policy Review*. 4(1986): 325-344.
- Cropper, M.L., Lee, D.R. and S.S. Pannu, "The Optimal Extinction of a Renewable Natural Resource." *Journal of Environmental Economics and Management*. 6(1979): 341-349.
- Dasgupta, P. and G. Heal, "The Optimal Depletion of Exhaustible Resources." *The Review of Economic Studies*, 1974 Symposium. pp. 3-29.
- Eckholm, E. and L.R. Brown, "Spreading Deserts - The Hand of Man." World Watch Paper 13. World Watch Institute, 1977.
- Egboh, E.O., "The Nigerian Gum Arabic Industry, 1897-1940". *Cahiers d'Etudes Africaines*. 43(1969-1970):215-221.

- French, D., "Confronting an Unsolvable Problem: Deforestation in Malawi". *World Development*. 14(1986): 531-540.
- Green, J.K., "Evaluating the Impact of Consolidation of Holdings, Individualization of Tenure, and Registration of Title: Lessons From Kenya. LITC paper 129. Land Tenure Center. University of Wisconsin, Madison. Madison, WI. February, 1987.
- Hopkins, A.G., "The World Bank in Africa: Historical Reflections on the African Present". *World Development*. 14(1986): 1473-1487.
- Jagannathan, N.V., "Corruption, Delivery Systems, and Property Rights". *World Development*. 14(1986): 127-132.
- Jodha, N. S., "Common Property Resources and Rural Poor in Dry Regions of India," *Economic and Political Weekly*. 21:1169-81, July 5, 1986.
- Larson, B. A. and D. W. Bromley, "Property Rights, Externalities, and Resource Degradation: Locating the Tragedy." Washington, D.C., 1988.
- Lundgren, B., "Global Deforestation, its Causes and Suggested Remedies." *Agroforestry Systems*. 3(1985): 91-95.
- Myers, N., "The Hamburger Connection: How Central America's Forests Become North America's Hamburgers". *Ambio*. 10(1981):3-10.
- National Research Council, *Proceedings from the Conference on Common Property Resource Management*. Washington: National Academy Press, 1986.
- Noronha, R., "A Review of the Literature on Land Tenure Systems in Sub-Saharan Africa". Report ARU 43. World Bank. July 19, 1985.
- Page, T., *Conservation and Economic Efficiency: An Approach to Materials Policy*. Baltimore: John Hopkins University Press. 1977.
- Perrings, C.P., "Optimal Path to Extinction? Poverty and Resource Degradation in the Open Agrarian Economy." University of Auckland, Auckland, New Zealand. 1987.
- Raintree, J.B., "Agroforestry, Tropical Land Use and Tenure." International Council for Research in Agroforestry. Workshop on Tenure Issues in Agroforestry. Nairobi, Kenya. May, 1985.
- Ruddle, K. and W. Manshard, *Renewable Natural Resources and the Environment — Pressing Problems in the Developing World*. New York: United Nations University, 1981.
- Runge, C.F., "Common Property Externalities: Isolation, Assurance, and Resource Depletion in A Traditional Grazing Context." *American Journal of Agricultural Economics*. 63(1981):595-606.

- Schultz, T.W., "Nobel Lecture: The Economics of Being Poor." *Journal of Political Economy*. 88(1980): 639-651.
- Sen, A.K., "Isolation, Assurance, and the Social Rate of Discount." *Quarterly Journal of Economics*. 81(1967): 112-124.
- Southgate, D., Hitzhusen, F., and R. MacGregor, "Remedying Third World Soil Erosion Problems." *American Journal Agricultural Economics*. 66(1984): 879-884.
- Spears, J. and E.S. Ayensu. "Resource Development and the New Century: Sectoral Paper on Forestry". World Resources Institute, Global Possible Conference. 1984.
- Thomson, J.T., "Land and Tree Tenure Issues in Three Francophone Sahelian Countries: Niger, Mali and Bourkina Faso". International Council for Research in Agroforestry. Workshop on Tenure Issues in Agroforestry. Nairobi, Kenya. 1985
- The World Bank, *Desertification in the Sahelian and Sudanian Zones of West Africa*. Washington, D.C. 1985.
- United Nations Sudano-Sahelian Office (UNSO), *The Gum Market and the Development of Production*. Geneva/New York. 1983.
- Wade, R., "The Management of Common Property Resources: Collective Action as an Alternative to Privatisation or State Regulation," *Cambridge Journal of Economics*. 11(1987):95-106.
- \_\_\_\_\_, "The Market for Public Office: Why the Indian State is Not Better at Development". *World Development*. 13(1985): 467-497.
- \_\_\_\_\_, "Administration and the Distribution of Irrigation Benefits," *Economic and Political Weekly*. 6:1743-47, November 1975.