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S. V. Ciriacy-Wantrup

Richard C. Bishop

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"COMMON PROPERTY" AS A CONCEPT IN NATURAL RESOURCES POLICY*

S. V. CIRIACY-WANTRUP** and RICHARD C. BISHOP***

Institutions based on the concept "common property" have played socially beneficial roles in natural resources management from economic pre-history up to the present. These same institutions promise help in solving pressing resources problems in both the developed and the developing countries. It is all the more important that these institutions be the focus of an economic study because they have been misunderstood by modern day economists: We refer to the so-called "theory of common property resources" or what is often termed the "tragedy of the commons."¹

The extensive literature on the "theory of common property resources" accumulated over the past 20 years is summarized by the maxim "everybody's property is nobody's property." That is, when a given natural resource is physically and legally accessible to more than one resource user, the result is said to be a free-for-all, with users competing with one another for a greater share of the resource to the detriment of themselves, the resource, and society as a whole. At one time or another, this idea has been applied to an array of resources including fisheries, grazing lands, forestry, groundwater, oil, air, campgrounds, and even highways and the radio spectrum. Students of these resources maintain that the "common property condition" is largely to blame for a host of social ills including resource depletion, pollution, dissipation of economic surplus, poverty among resource users, backwardness in technology, and misallocation

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**Professor of Agricultural Economics, Emeritus, University of California, Berkeley.

***Assistant Professor, Department of Agricultural Economics and Center for Resource Policy Studies, University of Wisconsin, Madison.

1. The literature in economics is large. Recent examples, some of which provides extensive references to the earlier literature include:

Bell, *Technology Externalities and Common Property Resources: An Empirical Study of the U.S. Northern Lobster Fishery*, 80 J. Pol. Econ. 148-58 (1972); Haveman, *Efficiency and Equity in Natural Resource and Environmental Policy*, 55 Am. J. Ag. Econ. 868-78 (1973); A. Freeman, R. Haveman, & A. Kneese, *The Economics of Environmental Policy* 77-9 (1973); Dales, *Rights and Economics*, in *Perspectives in Property* 151 (Wunderlich and Gibson eds. 1972). Two contributions from outside of economics but expressing the same views are: Hardin, *The Tragedy of the Commons*, 162 Sci. 1243-48 (1968); and Crowe, *The Tragedy of the Commons Revisited*, 166 Sci. 1103-7 (1969).

of labor and capital. Proposed solutions run in two directions. One is to make the "common property" resource in question the private property of individual resource users, who, via the "invisible hand," will manage the resource in society's best interest. Alternatively, the problem is to be solved by governmental intervention, through taxes or subsidies designed to bring private and social costs into balance or—that failing—by direct governmental controls of inputs or outputs or both.

Is this an adequate picture of mankind's experience with commonly owned resources? We submit that it is not. One source of misunderstanding is that the term "common property" is used in a way often at odds with the long-standing meaning of the concept, sometimes to the point of being self-contradictory. To some extent, then, this paper necessarily involves the meaning of concepts, or the lack of such meaning. The paper goes beyond such a discussion of the concept of common property to an examination of its policy implications. These have been misinterpreted in economic literature in such a way as to discredit a concept that is a valuable tool in the economic analysis and solution of difficult problems of natural resources policy.

I COMMON PROPERTY AS A SOCIAL INSTITUTION

"Property," as applied to natural resources, is a "primary" social institution² both because of its own importance and because several important "secondary" institutions, including taxation, credit and tenancy, are derived from it.³ "Property" refers to a bundle of rights in the use and transfer (through selling, leasing, inheritance, etc.) of natural resources. Different rights (strands of the bundle) may be distributed in various combinations among natural and legal persons, groups, and several publics, including the many units of government.

The term "common property" as employed here refers to a distribution of property rights in resources in which a number of owners are co-equal in their rights *to use* the resource.⁴ This means

2. Institutions have been defined elsewhere as social decision systems "that provide decision rules for adjusting and accomodating, over time, *conflicting* demands (using the word in its more general sense) from different interest groups in a society." Ciriacy-Wantrup, *Natural Resources in Economic Growth*, 51 Am. J. Ag. Econ. 1319 (1969).

3. See S. Ciriacy-Wantrup, *Resource Conservation: Economics and Policies* (3rd. ed. 1968).

4. It should be noted that the concept, as employed here, refers to the right *to use* the resources, but not to transfer. Heirs of a common owner become co-owners themselves only through their membership in the group (tribe, village, etc.).

that their rights are not lost through non-use. It does *not* mean that the co-equal owners are necessarily equal with respect to the quantities (or other specification) of the resource each uses over a period of time. In other words, the concept as employed here refers to resources subject to the rights of common use and not to a specific use right held by several owners. In the legal literature this distinction appears as "common lands" on one side and "tenancy in common" on the other.⁵

This meaning of the concept "common property" is well-established in formal institutions such as the Anglo-Saxon common law, the German land law, the Roman law, and their successors. It is also well-established in informal institutional arrangements based on custom, tradition, kinship and social mores.

Sometimes both the institution and the resources subject to the institution are called the "commons." It is helpful, however, to differentiate between the concept, the institution, which in many variations makes the concept operational in reality, and the particular resource that is subject to the institution. In any event economists are not free to use the concept "common property resources" or "commons" under conditions where no institutional arrangements exist. Common property is not "everybody's property." The concept implies that potential resource users who are not members of a group of co-equal owners are excluded. The concept "property" has no meaning without this feature of exclusion of all who are not either owners themselves or have some arrangement with owners to use the resource in question. For example, to describe unowned resources (*res nullius*) as common property (*res communes*), as many economists have done for years in the case of high seas fisheries, is a self-contradiction. The problems of managing fisheries in territorial waters and those on the high seas have similarities—they are fugitive resources—but they are very different in actual and potential institutional regulation.⁶

On a broader scale, to lump problems associated with such greatly different resources as air—a ubiquitous resource—and fisheries—a fugitive resource—under the vaguely conceived concept of "common property resources" is to slur fundamental institutional relationships, an understanding of which is necessary if one wishes to study the social performance of an institution both in historical perspective

5. Jurgensmeyer & Wadley, *The Common Lands Concept: A "Commons" Solution to a Common Environmental Problem*, 14 Nat. Res. J. 368-81 (1974).

6. For further discussion, see Ciriacy-Wantrup, *The Economics of Environmental Policy*, 47 Land Econ. 36-45 (Feb. 1971).

and in the context of today's problems of resource policy. Such a study requires a conceptual framework.

II

SOCIAL PERFORMANCE OF COMMON PROPERTY INSTITUTIONS: A CONCEPTUAL FRAMEWORK

Institutions may be conceptualized as decision systems on the second level of a three level hierarchy of decision systems.⁷ On the first or lowest level, decisionmaking relates to the determination of inputs, outputs, and the host of similar decisions made by the operating sectors of the economy, individuals, firms, industries, and public operating agencies such as water projects and irrigation districts. This level of decision systems may be called the "operating level." The decision systems on the next higher level comprise the institutional regulation of decision-making on the first level. One may call this level of decision systems the "institutional level." On the third level changes in institutions on the second level are the subject of decision-making. This level of decision systems may be called the "policy level."

Decision systems on each level can be analyzed with respect to structure, functioning, and performance. This paper is concerned with the decision systems on the second level. The purpose of decision-making on this level is not to determine directly inputs, outputs, etc., on the operating level of the economy nor to attain a path of welfare optima over time on the operating level. On the contrary, the welfare optima as defined in modern economics—even assuming that they are valid and relevant on the first level—can be shown to lack such validity and relevancy when applied to the institutional level. A discussion of the reasoning behind this conclusion is found elsewhere⁸ and would take us too far afield here. Suffice it to say that the measure of performance of decision systems on the second level is not to achieve welfare optima, but rather to maintain and to increase welfare by continuously influencing decision-making on the lower level under constantly changing conditions that for any point in time cannot be projected, or can be projected only vaguely, and that are always uncertain with respect to actual occurrence.

What then has been the structure of common property institutions

7. For more detailed discussions see Ciriacy-Wantrup, *Water Policy and Economic Optimizing: Some Conceptual Problems in Water Research*, 57 *Am. Econ. Rev.* 179-89 (1967) and Ciriacy-Wantrup, *supra* note 6, at 40-45; and Ciriacy-Wantrup, *supra* note 3, at ch. 10 and elsewhere.

8. See material cited in note 7 *supra* for more detailed treatment.

over the years? How have they functioned? And, most importantly, how well have they performed?

THE COMMONS IN ECONOMIC HISTORY

Let us begin to answer these questions by looking back into economic history. Mankind's experience with the common ownership of natural resources started with communal hunting and gathering societies. Did welfare decrease under common property institutions? In particular, was there a tendency for these societies to overuse their resources because of common ownership?

Hunting and gathering societies are interesting in themselves and also allow us to make inferences about our own economic history. Some anthropologists have shown renewed interest in these rapidly disappearing societies, and more adequate documentation is now available.⁹ Obviously, within these societies the structure and function of resource-regulating institutions are based on customs, taboos, and kinship rather than on formal relations such as legislation and court decisions which characterize more "advanced societies." Still, these informal institutions confer the same rights, i.e., equality of the right to use for members of the group and exclusion of others, as the more modern formal institutions.

In communal hunting and gathering societies, without markets on which to sell surpluses, emphasis on sharing among members of the group tended to discourage accumulation.¹⁰ The community coped with increasing population density through customs and taboos regulating marriage, lactation, and other forms of behavior. The most important process, however, was "fission." As group size grows groups tend to split and become established in new areas. This process has been noted in enough situations to be regarded as a general characteristic of communal hunting and gathering societies.¹¹

Some African communal hunting tribes have practices which are more familiar to us. The Acholi of Uganda, for example, enforced closed seasons.¹² In cases where depletion of resources would be

9. *Man the Hunter* (R. Lee & I. DeVore eds. 1968).

10. Lee, *What Hunters Do for a Living, or, How to make Out on Scarce Resource in Id.* at 30-43. See also M. Sahlins, *Stone Age Economics* 46-47 and elsewhere (1972).

11. *Supra* note 9, at 9. The Mbuti Pygmies are an example and are described by C. Turnbull in *Man the Hunter*, *supra* note 9, at 132-37 and also in a book by Turnbull, *Wayward Servants* (1965). Other groups displaying this characteristic are discussed in *Man the Hunter*, *supra* note 9, by Lee & by R. Woodburn, *Stability and Flexibility in Hazda Residential Groupings* at 103-10.

12. Parker & Graham, *The Ecological and Economic Basis for Game Ranching in Africa, The Scientific Management of Animal and Plant Communities for Conservation* 394 (1971).

tantamount to disaster, the headmen of South Africa's bushmen groups functioned as inventory keepers.¹³

Such institutions were effective in managing resources on a sustained-yield basis.¹⁴ Population was not controlled by Malthusian scarcity. In fact, diets tended to be more than adequate. Some authors describe such societies as generally affluent, as that term is culturally defined for them.¹⁵ Common ownership of resources must be regarded as the key factor in maintenance of this condition. Rules of sharing reduced the incentives to deplete resources for individual gain. The process of fission was facilitated because no individual property rights had to be settled. Many of these societies were either sedentary or moved only within definite geographic areas in accordance with seasonal changes affecting the availability of forage for game and for gathering by humans. Such societies were capable of existing over long periods in equilibrium with their resources unless disturbed by unusual environmental changes or interference from the outside.

The most important outside interference with these societies has been contact with the market economy and other aspects of western culture. In many cases resources were depleted as a result of this contact. Two points need to be made. First, the group depleting the resource was not always the communal hunters and gatherers, as exemplified by the fate of the American bison. Second, self-sufficient hunting and gathering societies have inherent weaknesses in adapting to contact with the market. These weaknesses are not related to common ownership. The scenario usually involves the hunters and gatherers overusing their resources in order to acquire market products.¹⁶ Equally significant in many cases was the introduction of taxes to be paid in cash. Cash could only be acquired with overuse of resources in order to obtain a marketable surplus.¹⁷ This raises an important question. Can common ownership of resources perform well in a market economy? To answer that question we will turn next to a discussion of the European commons, some of which have continued to the present day.

From pre-history until the present some grazing lands and forests in Europe have been managed as common property resources. Struc-

13. D. Fraser, *Village Planning in the Primitive World* (1968).

14. We should note, however, that some authors suspect that hunting and gathering societies were instrumental in the extinction of some species during distant pre-history. See Long & Martin, *Death of the Ground Sloth*, 186 Sci. 638-60 (1974).

15. Parker and Graham, *supra* note 12 and Sahlins, *supra* note 10.

16. A. Firth, *Primitive Polynesian Economy* (1966).

17. See, e.g., Behannan, *Impact of Money on African Economy*, 19 J. Econ. Hist. 499-500 (1959).

ture, functioning, and performance of these institutions have been studied over a much longer period than the institutions of hunting and gathering societies.¹⁸

Grazing on the commons under European conditions was seasonal, and the beginning and end of the grazing season were set uniformly for all co-equal owners in accordance with forage availability. Grazing was permitted only during the daylight hours. Strong controls on grazing were maintained by the simple requirement that each individual livestock owner have sufficient feed base at his command to support his stock in the nongrazing season and during the night. In cases where overgrazing was a threat even with the feed base restrictions, e.g., with an increase in aggregate feed base due to the intensification of agriculture, common users were assigned quotas of animals they could graze on the commons during the grazing seasons, e.g., 1 horse, 2 cows, 10 hogs, 6 geese, a process which the English called "stinting."¹⁹

The historical reduction of the commons in Great Britain is well-documented in the voluminous literature on enclosure.²⁰ Overgrazing was not a cause. One important factor was the increased profitability for the feudal lord of grazing sheep for commercial wool production. Much land which had previously been farmed by peasants to produce food and other products for home consumption, as well as the former grazing commons, went into direct management by the manorial estate. Another factor was breaking up of the open field system in response to agricultural progress. Different parts of the peasant economy are closely related. After harvest, livestock could be grazed on the fallow land and stubble in the open fields.²¹ When agriculture intensified, through row crops and multiple cropping displacing the fallow and stubble fields, the open fields were enclosed, largely at the insistence of the feudal lord, and the peasants were displaced (often without compensation).²²

England and Wales still contain 1.5 million acres of commons, the bulk of which is grazed much as it has been for centuries. In addition

18. B. Slicher Van Bath, *the Agrarian History of Western Europe, 500-1850* (1963).

19. W. Tate, *The English Village Community and the Enclosure Movements*, 162-3 (1967) and W. Hoskins & L. Stamp, *The Common Lands of England Wales*, 36-7, 50, and elsewhere, (1963). An analogous system in the United States exists for stocking of the public range under Forest Service and Bureau of Land Management grazing permits. Here also grazing permits are allocated in accordance with the home feed base of the permittee and the availability of forage.

20. A recent collection of works which include references to the previous literature is *Studies of Field Systems in the British Isles* (A. Baker & R. Butlin, eds. 1973).

21. N. Neilson, *Medieval Agrarian Economy* (1936).

22. For more detail on the political economy of enclosure in England see Tate, *supra* note 19.

these lands are playing a new role which becomes increasingly important with each passing year as a refuge for residents of crowded, polluted cities.²³

Experience with the common forest lands on the European continent has been similar in many ways to that with grazing lands in Great Britain.²⁴ As forest lands became increasingly profitable as sources of timber for sale vis-a-vis their traditional role as sources of livestock forage, firewood for home consumption, and building material for the peasant village, the feudal lords changed from administrators and protectors to profit-seeking entrepreneurs. The feudal lord's rights in the common forests had been confined to hunting rights, which were vested solely in him, and his grazing and other rights, which he held as a co-equal with his villagers. When timber use became profitable, grazing and wood gathering became an impediment to timber production. The feudal lord was motivated to reduce and eliminate the grazing and other rights on the commons.²⁵

In addition the same factors mentioned above in connection with the enclosures in Great Britain operated. Here also the result was a weakening of the village system and dispossession of the peasantry. The peasant was transformed from a co-equal owner on the commons with secure tenure to a landless worker on the feudal estate. This is the true "tragedy of the commons."

The feudal system never developed in some regions of the continent, such as portions of western Germany and Switzerland. With the increasing profitability of timber production some of the commons in these regions were divided among the villagers and became the woodlots of individual peasants. Frequently, however, the commons remained intact and formed the basis for modern municipal forests. The commons which remained intact became some of the best examples of progressive forest management. On the other hand, the commons that were divided into private woodlots were generally too small for efficient forestry and degenerated until government intervention through regulation, assistance, and education reversed the trend. Results were exactly the opposite of what the "theory of common property resources" would lead one to expect. The substi-

23. See Hoskins and Stamp, *supra* note 19, at 3 and elsewhere.

24. We do not consider the French case explicitly here but the interested reader may consult S. Herbert, *The Fall of Feudalism in France* 47-50 and elsewhere (2d ed. 1969).

25. One writer described developments in France as follows: "As the commercial and manufacturing activity increased, there was a concomitant rise in the market value of forest products and the struggle was on. The increased economic value of forest holdings led the seigneurs and the king to become covetous of the community rights and to devise various ways and means for usurping them." F. Sargent, *Land Tenure in the Agriculture of France*, (1952 unpublished Ph.D. thesis in library of University of Wisconsin, Madison).

tution of private ownership for common ownership is not in itself a socially desirable change.

Finally, we may mention the continued success of grazing commons in the highly productive Alpine meadows—for example, in Switzerland, Austria, and southern Bavaria. These are above the timberline and were, therefore, not affected by changes in the profitability of forestry under the expansion of the market economy. Here common property institutions have not changed significantly since the Middle Ages. Seasonal grazing and the necessary home feed base are still key features. The only difference from the feudal grazing system described above is that the movement to and from the commons takes place only once a year because travel is longer and more difficult.

The continued operation of commons both in England and on the continent answers the question raised earlier about the viability of common property in the market system. Common property, with the institutional regulation it implies, is capable of satisfactory performance in the management of natural resources, such as grazing and forest land, in a market economy.

IV

THE COMMON PROPERTY CONCEPT IN THE SOLUTION OF PROBLEMS OF NATURAL RESOURCE POLICY

If the conclusions of the preceding historical sketch of the social performance of common property institutions are correct, one may ask whether such institutions might be helpful in the solution of present problems of natural resources policy. We believe that the answer is in the affirmative. In fact, it can be shown that the common property concept is already being employed to help solve important resource policy problems in the twentieth century. Groundwater and the fisheries may serve as illustrations.

Riparian institutions regulated the use of water from surface streams in England and on the continent long before formal riparian law was developed in Anglo-Saxon common law and German land law. The notion that the users of a common surface source were co-equal in right was anchored in customs and traditions long before a codified and legally enforceable riparian law existed. One of the factors favorable to this development was the long experience with the commons in grazing and forest resources.

While the solution of problems of surface water use through riparian institutions is old, the problems created by groundwater use are recent. To be sure, use of groundwater is also old, as, for ex-

ample, in most countries of the Middle East. But pumping with the Persian wheel did not create problems because of the shallow depth and the low capacity of this system. The situation changed radically with the advent of modern pumping technology based on the deep well pump and electric and internal combustion power. Resource depletion, increasing costs of pumping, and overinvestment in wells were the result.

These problems were first solved in California by applying what is known as the Correlative Rights Doctrine, implemented through adjudication. As shown elsewhere, the Correlative Rights Doctrine must be regarded as a direct descendant of riparian law, which as we have seen is based on the common property concept.²⁶

All pumpers of a given groundwater basin are regarded as co-equal in right but adjudicated within the limits of the safe yield of the basin in proportion to their historical use. In the process of adjudication, small, essentially domestic uses are usually not considered, and new uses of this kind are permitted. There is no "limitation of entry" for the small user.

Procedures similar to adjudication based on the common property concept and resulting in quantitatively defined "quotas" of the resource also exist for fisheries. The fisheries situation is of interest not only in its own right but also because the "theory of common property resources" traces its origins to the literature on fisheries economics.²⁷ Overfishing has occurred with increasing frequency over the last century. The bulk of the literature blames this problem on the common property condition. In reality, common property institutions are much in evidence in the evolution of institutions to remedy overfishing.

The fishing season, for example, has been a widely applied tool of fishery regulation. Ideally, the season is open long enough to allow the fishermen to take the maximum sustainable yield from a given fish stock and then closed until another cropping becomes desirable. The parallels between fishing seasons and grazing seasons on the European commons are easily seen.

An important part of the evolution of the European commons was the determination of boundaries of the grazing land of each village and the determination of who had and who did not have co-equal rights to graze. Extension of exclusive national fishing zones (and in some cases territorial waters) to as much as 200 miles from the coast

26. Ciriacy-Wantrup, *Some Economic Issues in Water Rights*, 37 J. Farm Econ. 875-85 (Giannini Foundation of Agricultural Economics Paper 148, 1955).

27. Gordon, *The Economic Theory of a Common Property Resource: The Fishery*, 62 J. Pol. Econ. 124-42 (1954).

is analogous. While broad exclusive fishing zones raise many important issues, they do constitute one alternative institutional basis for better fisheries management.

Another interesting parallel between the historical commons and recent developments in fishery regulation is found in the establishment of national quotas. Such a system has been in effect for many years under the Convention for the Protection and Extension of the Sockeye Salmon of the Fraser River System, where the catch, which is predetermined on the basis of estimated maximum sustainable yield, is divided equally between fishermen of the United States and Canada. More recently a system of national quotas for certain species has been implemented by the International Commission for Northwest Atlantic Fisheries. Both of these management measures run parallel to the long-standing practice of stinting grazing commons.²⁸

As the prices of fish products have increased and the technology of capturing fish has improved, problems have developed with trying to regulate the fisheries through fishing seasons alone. In the extreme, the entire maximum sustainable yield may be taken in a few weeks, leaving men and gear idle for at least part of the rest of the year. This may also place great strain on processing facilities. The fishermen apply political pressure on regulatory agencies to extend the season and to allow the taking of protected species outside the regular season as "incidental catch," while exploiting other species. As a result of these pressures, the resource may become depleted. The common property approach suggests a potential remedy: to assign catch quotas to individual fishers in such a way as to make the aggregate of the quotas equal to the desired total catch, which, in the long run, would normally equal maximum sustainable yield. Just as in the groundwater case, small operators could be excluded from the quota system in fisheries where they take a sufficiently small share of the total catch. It might even be desirable to make the quotas salable. The details of implementation would vary from case to case. Just to define who is a "fisherman" and hence entitled to a quota would require careful study of each individual situation.

There are some similarities between such a quota system and limitation of entry as it is discussed in the more theoretical literature in fisheries economics. In practice, however, limitation of entry programs are emphasizing restrictions on inputs. In British Columbia, for example, the restrictions apply to the tonnage of vessels. This reflects

28. The economics of commercial fishing, including the institutional aspects, is discussed in more detail in R. Bishop, *U. S. Policy in Ocean Fisheries: A Study in the Political Economy of Resources Management 1971* (University Microfilms No. 12-21, 623) (unpublished Ph.D. thesis in the library of University of California, Berkeley).

the emphasis which most economists have placed on the misallocation of capital and labor that they believe exists between fishing and the rest of the economy. Thus, the goal of limitation of entry is to get capital and labor out of fishing and into other industries until an efficient balance is reached. Under the quota system suggested above, the emphasis is on outputs, not inputs, although some reduction in inputs might well occur. This reflects the conclusion that in a grossly imperfect economy like that of the United States the problem of misallocation between the fishing industry and the rest of the economy is insignificant, especially if fishing resources are as immobile as available data indicate that they are.²⁹ A quota system would place the emphasis exactly where it needs to be: on protection of the resources and, if desired, on security of tenure for fishermen, especially those with low incomes and few employment alternatives.

There is much yet to be done before the world's commercial fisheries are adequately managed. These examples, however, do show that the common property approach is already fulfilling an important role. Following those who believe that the high seas fisheries should be treated as the common heritage of all mankind, one might well wonder if the ultimate solution is to treat these resources as a giant commons managed as a trust by some international agency such as the United Nations.

In summary, overgrazing, overfishing, permanent depletion of groundwater, air pollution, and the like are serious present-day problems which deserve the attention of economists. But the "theory of common property resources," as interpreted in the economic literature, is an inadequate conceptual tool for the solution of such problems. The problems discussed in this literature involve resources which are either "ubiquitous" or "fugitive." Ubiquitous resources are resources which, at least up to some stage of economic development, are not scarce. Nobody is excluded from their use. Examples are air, solar radiation, precipitation, and wind. Institutions regulating their use and allocation are not needed before that stage of economic development is reached. In the case of air that stage has been reached, and institutions regulating use are developing. Fugitive resources are resources which are mobile and must be captured (reduced to possession) before they can be allocated to groups and individuals. Such capture and allocation always pose the problem of exclusion and, thus, institutional regulation tends to develop early. Common property institutions, as interpreted here, are the most important means of regulation.

29. See Bishop, *Limitation of Entry in the United States Fishing Industry: An Economic Appraisal of a Proposed Policy*, 49 *Land Econ.* 381-0 (1973).

V

COMMON PROPERTY, PUBLIC TRUST, AND PUBLIC PROPERTY

The suggestion of the preceding section, that the concept of common property facilitates rather than hinders the solution of present problems of resource policy associated with the fugitive nature of resources (as illustrated by groundwater and fisheries), may now be broadened. We refer to the application of what is known as the "public trust doctrine" to a wide spectrum of resource policy problems.

While we fully appreciate the important role of the judiciary in developing and applying the public trust doctrine in the United States,³⁰ there is little doubt that the basic doctrine as embodied in Roman and Anglo-Saxon law is derived from the common property concept as interpreted in this essay. Some legal scholars even maintain that the public trust doctrine "is really the common lands concept, which has and continues to express communal interest and right to land resources."³¹

Public trusteeship in the United States is already extensive. With some exceptions Indian land is held in trust by the federal government in accordance with the communal traditions of Indian tribes, although the Bureau of Indian Affairs has often acted as if it were public land.³² Water resources, shorelines, parklands, fish and game, and other natural resources are held in trust by many states.³³

For purposes of natural resources policy such public trust resources must be differentiated from public property resources. First, legal restrictions on disposition of trust resources and on changes in their use are more stringent than on public property resources not subject to the trust doctrine. Second, resources under the public trust doctrine are subject to government regulation without the legal obstacle of "taking for a public purpose" and therefore without involving the issue of compensation. The latter point is frequently not appreciated and may be illustrated by a recent case.

The navigable waters of Wisconsin are held in trust by the state.³⁴ This principle involved a court test of the Wisconsin Shoreline Pro-

30. Sax, *The Public Trust Doctrine In Natural Resource Law: Effective Judicial Intervention*, 63 Mich. L. Rev., 471-565, (1970).

31. Jurgensmeyer and Wadley, *supra* note 5, at 379.

32. Dörner, *Needed: A New Policy for The American Indians* 37 Land Econ. 162-73, (1961); see also Jurgensmeyer and Wadley, *supra* note 5, at 371-74.

33. See Sax, *supra* note 30.

34. H. Ellis, *et. al.*, *Water-Use Law and Administration in Wisconsin* 140 and elsewhere (1970).

tection Act.³⁵ Passed in 1966, this act requires local governments to develop shoreline zoning. The case in question was *Just v. Marinette County*.³⁶ The plaintiff was prevented from filling some wetlands by Marinette County under its shoreland zoning ordinance and asked for compensation, claiming that his private property had been taken for a public purpose. The court ruled to the contrary. It stated that the ordinance was a legitimate use of the police power. One of the key points in the case has been stated by Bosselman, Callies, and Banta as follows:

The Court noted that the lakes and rivers were originally clean and said that the State of Wisconsin has an obligation in the nature of a public trust to "eradicate the present pollution and to prevent further pollution." It found that the regulation sought to prevent harm to "the natural *status quo* of the environment," and was not designed to produce a public benefit for which compensation would be required.³⁷

From the standpoint of natural resources policy the public trust approach offers important advantages over the public property approach. Frequently public property resources are disposed of or their use is changed as a result of the influence of rather narrow interests on governmental bureaucracies. The Army Corps of Engineers, the Bureau of Reclamation, the Bureau of Land Management, and the highway departments of the states are examples. Application of the public trust doctrine would force these bureaucracies to take broader public interests—i.e., those of *all* common owners—into account.

Even more important, the public trust doctrine can be applied to many problems of "quality" in resource use for the solution of which the public property approach would be ineffective or too costly. The problems of water and air quality are well-studied examples.³⁸ Beyond these some even broader public interests in the environment can be protected through application of the public trust doctrine. Protection of endangered wildlife species and of the scenic beauty of a landscape may be mentioned in this connection.³⁹ Such

35. Wisc. Stat. Ann. Section 144.26, Section 59.971.

36. 56 Wis.2d 7, 201 N.W.2d 761 (1972).

37. F. Bosselman, D. Callies, & J. Banta, *The Takings Issue*, 218-19 (1973).

38. See Ciriacy-Wantrup, *Water Quality: A Problem for the Economist*, 43 J. Farm Econ. 1133-44 (1961).

39. Ciriacy-Wantrup & Phillips, *Conservation of the California Tule Elk: A Socioeconomic Study of a Survival Problem*, 3 Biological Conservation 23-32 (Oct. 1970); Bishop, *Conceptual Economic Issues in Conserving the California Condor*, 1972 W. Agricultural Econ. Ass'n. Proc. 119-22.

application is still in the first tentative stages. But some optimism for the future is warranted in view of the durability of the common property concept and the viability and social performance of the institutions that make it functional.