



Resource development and the Missouri River Basin
by Robert W Bowman

A THESIS Submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree
of Master of Science in Agricultural Economics
Montana State University
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Abstract:

This thesis is an attempt to think through some of the basic problems of resource development,, particularly those pertaining to the Missouri River Basin. It develops what, it is hoped, are suggestive analyses of the complex social processes involved in resource development in order that the problem situations and strategic factors are related to a deductive theory in a way which mates further detailed research more purposeful and, therefore, more fruitful.

Chapters II, IV, and V are mainly descriptive of (II) the Missouri Basin, (IV) some aspects of the agencies responsible for developing the basin, and (V) measures to coordinate their activities.

Chapter I explains the almost inordinate contemporary national and international excitement over the words "resource development"; here apparently is the new panacea. But do we really understand what we are doing when in this modern age we can technically develop resources almost overnight? Chapter III makes a case for a new intellectual discipline, "generalism," to evaluate and integrate into social thought and action the implications of specialized research; this chapter also establishes a structural framework for the study and gives an analysis of the public planning process.

Chapter VI examines the social significance of reservoir siltation, with particular reference to the Missouri Basin, Chapter VII discusses some of the criteria by which federal investments should be evaluated.

Chapter VIII attempts to redefine "region" and "regionalism" and then examines the relationship between the Missouri Basin and regionalism.

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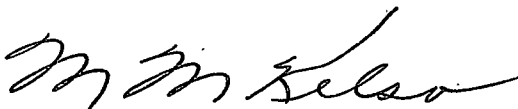
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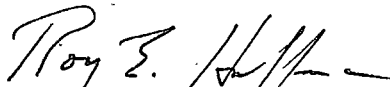
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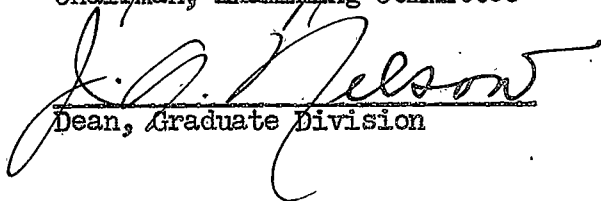
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PREFACE AND ACKNOWLEDGEMENTS

It took approximately fourteen months for a group of seven distinguished persons with a staff of over fifty persons to prepare a three volume, 2015 page report on policies for the development of the water resources of the United States.

It is, therefore, with appropriate humility that the writer presents this disquisition on some of the policies for, and some of the problems of, developing all the resources of the United States and particularly those of the Missouri Basin.

I have received a great deal of stimulation from various members of the faculty of Montana State College for which I am grateful. All the members of federal and state agencies with which I have had contact have been most kind and helpful.

The experience of the writer in government service suggests that public agencies are frequently aware of, and grappling with, problems which are not and often cannot be made public. For this reason the text does not imply that government agencies are unmindful of the problems which will be examined here. Rather, the purpose is to encourage wider public interest and thought on the exciting and crucial problems of resource development.

ABSTRACT

This thesis is an attempt to think through some of the basic problems of resource development, particularly those pertaining to the Missouri River Basin. It develops what, it is hoped, are suggestive analyses of the complex social processes involved in resource development in order that the problem situations and strategic factors are related to a deductive theory in a way which makes further detailed research more purposeful and, therefore, more fruitful.

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Chapter I

AN INTRODUCTION TO RESOURCE DEVELOPMENT

Resource development has become, according to one's point of view, one of the most popular or unpopular catch-phrases of the day. When an actor who has lived and played in obscurity for many years suddenly becomes famous, curiosity usually impels some individual to seek a way of explaining the transformation.

Resource development is not unlike our actor. It is not a new activity. In the year 3500 B.C. levees were being built around patches of the Tigris-Euphrates delta in order to dry up the rich alluvium and make its cultivation possible. In Egypt, soil fertility and productivity were being improved some 4000 years ago by an annual controlled inundation with the waters of the River Nile. At a much later date, the buried reserves of light, heat, and power were developed to establish the Industrial Revolution in Britain; this brought in its train the imperialist development of raw materials and markets in the so-called colonial areas. In the United States, mining, deforestation, the settlement of virgin soil, the building of roads and railways in the nineteenth century, were all spectacular examples of resource development.

Why, then, has this vast historical process suddenly "arrived"?

Before attempting an answer to this question, it would be pertinent to examine the nature of the process. In essence, it is extremely simple, being no more than a reorganization of factors of production to generate

output from previously unused natural resources, in response to human needs and ambitions, and in accord with the conditions imposed by the contemporary civilization. 1/

Human needs, human ambitions, and the conditions imposed by civilization are not to be regarded as discrete dynamic factors in resource development. They are interdependent forces. For instance, a new method of extraction from lean ores makes previously undeveloped deposits potentially valuable, and the object of men's ambitions. The ready availability of timber leads to the discovery of new ways of using wood--again providing an outlet for men's ambitions. The needs of men for food and clothing frequently make the settlement of virgin lands obligatory, which involves the development of new technics 2/ for exploiting a strange environment.

The development of resources is, then, no more than an attempt by man to satisfy his needs and ambitions by rearranging factors of production and his civilization in such a way as to maintain and improve the state of his material and "emotional" well being. To include "emotional" well being may give rise to some misgivings, but it is here contended that the deve-

1/ "Civilization" is used in MacIver's sense, i.e., "the whole mechanism and organization which man has devised in his endeavour to control the conditions of his life. It would include not only our systems of social organization, but also our techniques and our material instruments." MacIver, R. M., Society, 1937, p. 272.

2/ "Technics" is used in Mumford's sense, i.e., "a translation into appropriate practical forms of the theoretic truths, implicit or formulated, anticipated or discovered, of science." Mumford, Lewis, Technics and Civilization, Harcourt, Brace and Co., New York, 1934.

lopment of resources is not wholly the result of impulses which can be explained in the rationale of economics. The history of land settlement in the United States is inextricably bound up with the desires of immigrants to put their European serfdom behind them and become owner-operators, i.e., "free-men." Even today it is not improbable that some of the massive concrete structures for harnessing water resources may have been conceived by their progenitors, partly with an eye to their memorial function. 3/

In a rapidly changing society, changes in the physical bases of life and in human needs and ambitions consistently outrun the institutional changes which are necessary to make these needs and ambitions effective in the total web of social action. This difficulty of the institutional lag may be ignored for the present, though its implications are extremely germane to the ensuing chapters.

So far, the concept of resource development has been restricted to the reorganization of inanimate material factors. This is in fact something of a popular misconception as to the nature of the process. It is misleading because men are not only instigators of resource development, but are themselves resources. This fact is explicitly recognized by the U. S. program of public education, which is based on the notion that educated citizens are indispensable to a higher material and "emotional" standard of living. In fact, one of the most pressing problems of the day is to

3/ Verbal statement made to the writer in 1950 by a prominent U. S. government official.

devise a social and educational system which will help the individual to fully utilize the resources within himself. This should eliminate some of the frustration of the individual and should raise the well-being of society by fully utilizing the latent powers of the individuals who comprise the nation.

Thus far, the essential nature and antiquity of resource development have been indicated; therefore, why, and in what way, has an old "act," heretofore largely ignored by the critics, become "front page" news?

The following explanations are offered:

(1) There is a general realization that international power, whether military, economic, or political, rests on the degree of industrial development within a region, and the resource base which it has available to feed its men and machines. National strength involves developed resources, such as a high horsepower/man ratio, adequate efficient transportation, complex equipment and men capable of using it effectively, abundant reserves of raw materials ready for exploitation at short notice, and so on. Perhaps the most obvious measure of this power was the virtual subjugation of China's four hundred millions by Japan's seventy millions in the period from 1937 to 1940. It is unfortunate for mankind that this feature of resource development should need to be emphasized, but it is important for this study because controversies over programs are frequently "resolved," if that is the right word, by invoking the plea of being in the interests of national security. Such an argument is usually decisive. The feature is also realistic in the contemporary situation, where the ideological divergence and great power of both the U.S.A. and the U.S.S.R. constitute

a positive threat to world peace.

(2) Arising out of the schism between the political East and West, there is a need for a constructive policy, sponsored by countries with the western approach to democracy, to prevent the expansion of the potential enemy. President Truman's Inaugural Address of January 20, 1949, gave effect to such a policy under what is now familiarly known as the "Point-Four" program. Very briefly, the program recognizes that nations whose populations live in continuous economic and social misery are particularly receptive to the, not wholly specious, blandishments of communism. 4/ Therefore, so the argument runs, by improving living conditions, it may be possible to create a favourable environment for the growth of democracy a l' Ouest. The guiding principle for the program is to help those countries which are willing to help themselves; and while the difficulties to be faced will be tremendous, the general approach would appear to be very much worthwhile. It is to be hoped that the results will be equally so.

(3) For centuries, the economic and geographical worlds have been contracting at an ever-increasing rate. The significance of this process lies in the growing interdependence of events in all parts of the world and in all spheres of human activity. The manifestations of this phenomenon

4/ For instance, the corruption, inefficiency, and great inequalities of wealth associated with the Chiang Kai-shek regime made a political change inevitable in China. The communists, with a radical program of reform and backed by a willing army, must have appeared more attractive to the peasant than the Kuomintang. Who are we to say that the Chinese people should have resisted communism when there was no better alternative offered and when they had no means of knowing or even caring about the long-term implications of communism?

can be illustrated in many ways. At the political level, interdependence is recognized and partly consummated in the United Nations Organization. At the economic level, prosperity in the United States can, and usually does, affect the economic health of many other nations. Wool prices in Australia affect the production of synthetic fibres in the U.S.A. The prohibition of exports from the U.S.S.R. to Yugoslavia means substantial trade reorientation for Yugoslavia and the western nations. At the sociological level, the transfer of technology and related cultural values from the West has caused profound upheavals in Indian and African patterns of society. Improved health services established by colonial powers, unaccompanied by the transfer or development of new social values, has already made the demographic problem, in many parts of the world, almost insuperable. This interdependence may be likened to a delicate plane surface resting on a highly rugose surface. The fewer the high points, the more uneven their distribution, and the greater the discrepancy between the high and low points, then the greater the likelihood that the plane will collapse or overbalance to a catastrophic degree. The rugose surface, of course, represents the co-existence of many nations at greatly varying levels of wealth, social organization, political organization, and technological development. It is the recognition that, in this interdependent world, the wealthy nation cannot isolate itself from its poverty stricken (or powerful) neighbours, which led President Truman to say "Only by helping the least fortunate of its members to help themselves can the human family achieve the decent, satisfying life that is the right of all

people."^{5/} The implication of Point Four is that this laudable purpose can be greatly implemented by resource development, in the broadest sense.

(4) The growth of national independence in the old colonial areas, the growing voice of previously mute masses in the conduct of their national affairs, plus the desire of their leaders to maintain their own power and increase the power of their respective countries make resource development in these areas not only desirable, but inevitable.

So far, the explanations put forward have been in terms of the international scene. The following points are particularly applicable to the domestic scene in the United States.

(5) Most of the more obvious outlets for extensive private development in the United States have already been filled. In addition, those resources which remain to be developed are either beyond the means of private capital or they are too unattractive for it.^{6/} Irrigation, flood control, and silviculture spring to mind as examples of future resource development which private enterprise either cannot, or will not, undertake.

(6) The history of resource development in the U.S.A. is one of economic plunder; to satisfy immediate ambitions without thought of the

^{5/} From the Fourth Point in the Inaugural Address, January 20, 1949.

^{6/} As long ago as the eighteenth century, Adam Smith laid down the principle that it is the duty of the sovereign or commonwealth to erect and maintain "those public institutions and those public works, which, though they may be in the highest degree advantageous to a great society are, however, of such a nature that the profit could never repay the expense to any individual or small number of individuals, and which it therefore cannot be expected that any individual or small number of individuals should erect or maintain."⁰ Wealth of Nations, Book V, Chapter 1, Part III.

probable expense to posterity. The bare eroded slopes of parts of the Rockies due to predatory logging; the miles of inedible sagebrush now occupying once healthy grassland because of overgrazing; the "dust bowl" of the '30's because of excessive tillage in a semi-arid climate; and the falling floor of the Santa Clara Valley because of feverish uncontrolled water pumping for irrigation, 7/ all these examples demonstrate some of the long-run social costs of unregulated private development.

(7) The logical upshot of points (5) and (6) is an ever-increasing volume of domestic public investment. Again, this is not a new type of activity. Egyptian, Iraqi, and Mercantilist development involved a great deal of public investment. What is new, however, is the expansion of public investment, which is somewhat marginal in the strict economic sense, within a democracy cradled in the era of "laissez-faire." The very basis of the United States Constitution is freedom and independence for the individual. These conditions were probably achieved in the early frontier days, when there were few social or economic barriers and few traditional requirements for self-fulfilment. The economy was in too great a state of flux to enable such inhibitive forces to develop. Today, despite the existence of a society full of economic and social barriers to freedom, independence, and self-realization as originally conceived, these old conceptions are substantially identified with the modern pattern of society in the U.S.A. The spirit of the Physiocrats and the Classical Economists

7/ Vogt, William, Road to Survival, New York, 1948, p. 128.

still permeates most sections of society. Governmental investment is regarded as a gratuitous tampering with the "Natural Order," "The Invisible Hand," "liberty," "property," and thus faces considerable opposition from some particularly vocal segments of society.

(8) Closely allied with point (7) is the rapid expansion of governmental activity and spending over the last fifty years, in particular, the last twenty years. This involves increasing taxation to provide spending power over which the individual has very little direct control. Government spending cannot, in the long run, be justified by the personal predilections of the politician but must be defended by reference to general scientific and ethical principles which are debated in open forum by a society which exhibits extreme variations in its attitudes to such principles.

(9) The conflicts exemplified by points (7) and (8) can no longer be settled in the "salon" or by outright coercion. Universal suffrage, modern techniques of information propagation, relative freedom of speech and association, the wide dissemination of economic, political and institutional power in the United States, all ensure that there will be not only divergence of opinion, but also ample opportunities for its expression. In the field of resource development, a few examples will illustrate the possibilities of the situation. At the political level, the existence of two aggressive political parties equally uninhibited with regard to each other results in an ability to make political capital out of public spending or non-spending. The fact that congressmen draw their respective legislative authority from different parts of the nation frequently leads to what we might call regional favouritism in resource development, or at least

derisory cries of it. At the administrative level, the programs of the Bureau of Reclamation and the Army Engineers for the Missouri Basin appear to be designed for the purpose of maintaining intact or expanding their bureaucratic empires, as much as for benefiting the inhabitants of the Missouri Basin. Economic groups, such as the private utility companies and the railroads, have their lobbyists in Washington to influence congressional decisions. 8/ Private business as a whole conducts through the press 9/ and through the publications of the National Association of Manufacturers and the Foundation for Economic Education, 10/ its ceaseless campaign against government interference in private preserves and against taxation, or its corollary, public spending. On the other hand, organized labour, in the shape of the American Federation of Labour, the Congress of Industrial Organizations, and the National Farmers Union, have supported government participation in resource development. 11/

(10) Since the end of the nineteenth century, the idea of conservation,

8/ See Terral, Rufus, The Missouri Valley, Yale University Press, 1947, page 218 for information on the National Association of Electric Companies, a power lobby. See also St. Louis Post Dispatch for May 12, 1945. Ibid, page 209 for information on the National Reclamation Association, a railroad lobby.

9/ It seems unnecessary to quote specific sources on this point; there are so few exceptions to the general hostility of the press to increased government activity of any kind.

10/ See, for instance, von Mises, Ludwig, Planned Chaos, Foundation for Economic Education, New York, 1947.

11/ See Terral, op. cit., page 222.

fathered by such people as Theodore Roosevelt and Gifford Pinchot, has been steadily finding a place in the thinking of the American people. Books by such writers as Vogt, 12/ Sears, 13/ Osborn, 14/ and Bennett, 15/ with their quasi-panic import have drawn attention to the excesses of past exploitation and the need for more conservationary development in the future. There is a growing awareness that at present rates of consumption, many critical resources such as oil and copper will soon be exhausted. This growth in conservation consciousness plays its part in the general interest in development designed to offset dwindling resources. Unfortunately, however, there is no great degree of correspondence between attitude and action. Too frequently conservation is something which the "other fellow" should be practicing; and, indeed, in a highly competitive society, it is almost futile to expect that conservation measures which are designed to protect posterity will be widely adopted without government stimulation and control.

(11) Particularly since the Keynesian "revolution" the part which public resource development might play in mitigating the effects of secular or cyclical unemployment has received much consideration. Hansen, 16/

12/ Vogt, Wm., Road to Survival, Wm. Sloane Associates Inc., New York, 1948.

13/ Sears, Paul B., Deserts on the March, University of Oklahoma Press, 1935.

14/ Osborn, Fairfield, Our Plundered Planet, Faber and Faber, London edn., 1948.

15/ Bennett, H. H., Soil Conservation, McGraw-Hill, 1939.

16/ Hansen, A. H., Economic Policy and Full Employment, McGraw-Hill, 1947, Chapter XVI.

Morgan, 17/ and Clark, 18/ have all emphasized this function of maintaining the health of the economy.

(12) There is a growing concern among thinking persons that the mechanics of resource development and its long-term implications are very imperfectly understood. In a world where the grounds for action must be justified openly and on reasonably scientific grounds, and where the scale of action is frequently so large as to vitally affect large populations and whole patterns of society, there is no place for fumbling, confused, and piecemeal developments in any program which requires the willing cooperation of ordinary people. Therefore, it would seem to be in order at this point to mention briefly some of the problems of large-scale development which seem to have been neglected in current plans. They will be considered as implications of resource development as it appears to be conceived of in the United States today.

The first implication results from the interdependence of man and his environment in the following way. Geological history can be roughly classified into relatively short periods of mountain building, interspersed between long periods of peneplanation. In these long periods, gravity, aided by the elements, and of late by human forces, has led to the complementary processes of degradation and aggradation, which produce the mature landscape. The consequences of these slow and exceedingly long-term changes

17/ Morgan, T., Income and Employment, Prentice-Hall, 1947, Chapter XVI.

18/ Clark, J. M., Economics of Planning Public Works, Govt. Printing Office, 1935.

were not of great significance to man so long as average settlement densities were low, localization negligible, and private or social fixed capital at a minimum. The growth of population concentrations and permanent settlements assisted the increasing production of food, fibres, power, manufactures, and social services. With every step in the expansion of production, man's interdependence with his environment, and especially his modifications of it, became more complete.

Man's physical capital is a vital part of the framework on which modern society rests, and it may be objected that the works of man are no more permanent than the works of nature. It is doubtful whether this objection is really valid. For instance, the huge Tennessee Valley investments have created a complex economic and social fabric based on the production of cheap hydro-electric power and flood control. (There are, of course, many other features involved.) This economic and social superstructure will almost inevitably generate a will among the people whose lives and livelihoods depend on it to ensure the continued existence of the basic physical development scheme which makes the superstructure possible. What is more, the political, economic, and technological means of maintaining the basic development may be expected to lie within the control of the interested parties. However, it will be suggested later that in certain river basin developments, as at present conceived, and in the whole field of human technological invention, this may not be so.

This phenomenon of what the geographer calls "industrial inertia" can be well illustrated by reference to the United Kingdom, though the examples do not relate to river basin development.

At the village of Consett in the county of Durham, an iron works was established in 1840. The physical determinants of its location were local ironstone in the lower coal measures, a local outcrop of coking coal, and local silica rock. In a relatively short time, the local materials were almost worked out, but the capital equipment and the social superstructure remained. Therefore, coking coals were hauled from collieries twenty miles to the east, and haematite was imported through a port twenty miles distant and hauled up a steep gradient to the plant. The works grew, launched into steel production, and are now undergoing a major reorganization which will make them one of the largest steel plants in Britain. Its organic strength has greatly outweighed its present serious physical handicaps.

Another example of a rather different kind can also be taken from Durham county. When coal mining techniques were primitive, adits and shallow shafts were used to develop the upper coal measures of western Durham. As these deposits were worked out and mining methods improved, the industry moved eastward to the undeveloped, but deeper, seams of the lower coal measures. The social capital sunk into the original area was so great that, despite unemployment, poverty, and some migration eastward, the majority of the inhabitants refused to abandon the area, eking out what existence they could in marginal economic activities and on public relief. Finally the British government in 1946 deliberately fostered a policy of encouraging industrial migration into the area to fully employ the social capital already there. These examples, and there are many such in the United Kingdom, are not quoted to imply an inevitable causal relationship irrespective of the total environment, but to illustrate the tenacity

and power of survival of social and economic structures. It is this tendency of social organisms in a relatively stable environment to maintain what is in fact the status quo that makes for permanence in man's development schemes. This may be increasingly true in the United States where new frontiers, in the old sense, are disappearing and giving way to consolidation. Three significant inferences which may be drawn from this conclusion should be emphasized. First, the examples quoted relate to mining, which is perhaps the most unstable type of resource development, and yet which has not imparted its instability to social and economic institutions in the examples quoted, or at least only in a minor degree. Second, the Missouri Basin Development Plan is designed to stabilize agriculture and industry within that region, i.e., to strengthen the social and economic institutions of the area vis-a-vis the rest of the nation. Third, the operational emphases of a developed area will assuredly change, but the basic framework, e.g., dams, navigation channels, and irrigation projects is much less flexible over periods sufficiently long to be significant in the conduct of human affairs.

Therefore, if the increasing use of water resources by man is to continue, he must of necessity control forces which have hitherto been regarded as natural, because of the industrial and social inertia which may manifest itself in a given situation. Man can no longer be indifferent to natural changes due to erosion and siltation, for they interfere with his scheme of resource use. Moreover, development in the past has frequently speeded up these processes by the destruction of the biological cover. Although what we might call geological entropy is a very slow process, the more man

becomes involved in his environment, the more significant is the effect of even small physical changes upon complex and finely-adjusted economic and social systems. It could be argued that man's vastly improved technology enables him to modify his environment to suit his needs, but this rather misses the point. The essence of economy is the best use of resources; therefore, the more man discovers about his environment, the better able he is to use natural forces rather than upset them—a very costly process. This implies a reversal of the commonly-accepted idea that man is learning to control his physical environment. The more he acquires a proper understanding of the economic use of nature, the more it controls his actions.

A second implication appears to be as follows. It is generally ^{19/} agreed that a given amount of capital, up to a point, when applied to favourable natural resources, produces a higher return than it would if it were applied to less favourable resources. Therefore, it is necessary to plan public capital investment so that the returns to the investment can be equated at both intensive and extensive margins. In the United States, this might mean increasing intensive development in the Middle West and South and decreasing extensive development in the Great Plains. ^{20/}

A third implication of resource development in the U.S.A. concerns the assessment of repercussions on the rest of the economy resulting from a particular areal scheme. It can be argued that plans to rehabilitate the

^{19/} See Chapter VI for a further treatment of the first implication.

^{20/} See Chapter VII for a further treatment of the second implication.

