





## ABSTRACT

### ECOLOGY AS AN INTEGRATING FRAMEWORK FOR RESOURCE AND URBAN PLANNING EFFORTS IN THE UNITED STATES

by William Dean Lontz

Many problems are confronting man today. These problems may be visualized as health problems, education problems, social problems of youth, lack of recreation facilities, insufficient transportation facilities, conflicting land uses, air and water pollution, inadequate school facilities, and worn out land.

Man has developed three modes of planning in an attempt to solve these problems. These planning efforts are defined as resource planning (dealing with the natural environment), urban planning (dealing with the cultural environment), and resource-urban planning (dealing with both the natural and cultural environments).

This thesis explores the deficiencies in integration of these three modes of planning, which have resulted in a lack of coordination, work at defeating cross purposes, different public policy frameworks, and different territories. The first step is to understand how resource and urban planning have evolved in the United States. Joint resource-urban planning efforts are also explored. From this historical analysis it is possible to develop a picture of the present situation. A systems approach is developed to explore the natural resource planning system, the urban planning system, the resource-urban planning system, and the subsystems and components within each. The third step is to examine the field of ecology as a potential unifying model. The relationship of ecology to urban and resource planning is analyzed to discover existing ties. Initial research indicates that there is enough justification in ecology as a unifying field

to explore it in more detail. This leads to the exploration of ecology as an integrating framework, including analysis of several key concepts of ecology, resource planning, urban planning, and resource-urban planning. Using the integrative model, some potentials and problems of using ecology as a unifying field are discussed.

Overall conclusions in regard to both "planning for planning" and "substantive planning" for both resource and urban fields include:

Planning for Planning:

1. Development of planning territories and a hierarchy of planning areas for both fields.
2. Assists resource planners in understanding the cultural environment and urban planners in understanding the natural environment.
3. Assists both fields in becoming aware of techniques used by the other.
4. Problems of both fields can be viewed more comprehensively.

Substantive Planning:

1. The ecosystems approach offers both fields a comprehensive framework.
2. Flows between the cultural and natural environments can be more easily understood.
3. The concepts of the two fields are easily interchanged and utilized for overall development.
4. Assists in the recognition of new ideas concerning the development processes of both fields.

These conclusions lead to the development of recommendations which might guide further study and development of ecology as an integrating framework for resource-urban planning.



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FOR RESOURCE AND URBAN PLANNING EFFORTS  
IN THE UNITED STATES

By

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A THESIS

Submitted to  
Michigan State University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF URBAN PLANNING

School of Urban Planning and Landscape Architecture

1964

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## ACKNOWLEDGMENTS

The undertaking of a thesis of this nature requires patience, patience on the part of a thesis advisor. In this instance, the author wishes to acknowledge the efforts of Professor Stewart Marquis, who, besides patience, offered hours of consultation and many ideas which led the author beyond his expectations.

The author also wishes to acknowledge the assistance of Dr. Raleigh Barlowe and Dr. William Kimball of the Department of Resource Development. Without their encouragement the thesis would have been greatly limited.

Thanks are also due to Professor Sanford Farness of the Department of Urban Planning, who made his library liberally available to the author.

Last, but not least, I wish to acknowledge my family; my wife, Rita, for her countless hours of work and encouragement; my son, Marty, who allowed me to finish this "detheless"; and my daughter, Marci, who arrived at the most opportune time.

William Dean Lontz

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## INTRODUCTION

In every inhabited portion of the earth it may be observed that there is a cultural landscape overlying the natural landscape. Man develops his culture upon the natural landscape in many forms. He subdivides, clears and plows land; he irrigates and drains the land; he cuts timber, mines minerals and develops water supplies; he erects cities, develops social institutions and political controls. He lays out lines of transportation, fabricates articles and transacts business. All of these things occur in space and time and constitute the historic record of man upon the earth.

In some instances man has disregarded nature and has mistreated and exploited it. This mistreatment has brought about many problems which confront man; problems concerning man-to-man, man-to-artifact and man-to-nature relationships.

These problems can be visualized in health problems, both physical and mental; and in education problems, social problems of youth, lack of recreation facilities, insufficient transportation facilities, conflicting land uses, inadequate school facilities, air and water pollution, wornout land and lack of an adequate water supply.

These problems are more apparent in portions of the United States where urban and rural components are being meshed together. They are being magnified with the continued increase in population, the depletion of natural resources and development of dynamic technological advances. These problems have been summed up by Stewart L. Udall in his book, The Quiet Crises.

America today stands poised on a pinnacle of wealth and power, yet we live in a land of vanishing beauty, of increasing ugliness, of shrinking open space and of an overall environment that is diminishing daily by pollution, noise and blight.<sup>1</sup>

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<sup>1</sup> Stewart L. Udall, The Quiet Crises (Chicago: Holt, Rinehart and Winston, 1963), cover leaf.

Today man is faced with solving these problems. Three major efforts which have been made in working toward solutions are:

Natural Resource Planning - Natural resources are all those things which combine to form the natural environment. The visible portion is defined as the natural landscape. Natural resources can be visualized as physical, biological and intangible; some blend into the earth's surface, some above it and some below it. The purpose of planning is to maximize these resources for the best human use or the wise conversion of natural resources to commodities.

Urban Planning - Urban pertains to the area which makes up the towns, cities and hamlets, or basically that development which is the cultural environment. Urban planning is concerned primarily with man-made items such as transportation systems and housing and how man can regulate and direct these items into the most desirable living conditions.

Resource-Urban Planning - Resource-urban planning is the planning of both the natural environment and cultural environment and their interrelations.

But, basically, there has been little integrated planning effort; resource and urban planning have taken their own separate action. This has resulted in many problems such as:

1. Lack of coordination
2. Defeating cross purposes
3. Different public policy frameworks
4. Different territories of jurisdiction.

The major problem, and the one this thesis will concern itself with, is the coordination of the fields of resource and urban planning.

The coordination of these two fields has been advocated by many people. Stewart L. Udall in his book, The Quiet Crises, has said,

If we are to create life-enhancing surroundings in both cities and suburbs, the first requirement is the power to plan and to implement programs which encompass the total problems of

metropolitan regions. Air and water pollution, recreation and provision for adequate mass transit are region-wide problems, but in most areas action is hampered by legal impediments which actually prevent regional planning. As long as each city, county, township and district can obstruct or curtail, planning for the future cannot be effective. The cities and the metropolitan areas that are devising new political institutions for regional planning are today's pioneers of urban conservation.<sup>2</sup>

In an article entitled, "To Stay Out of Floods," by Harriet Holt Cooter, a member of the legal staff of the Tennessee Valley Authority, several points are brought out regarding integration of the two fields.

Protective works and land-use adjustments are the two basic means for reducing flood damages. Protective works include flood walls and levees, channel improvements, upstream detention reservoirs, drainage and conservation practices. Land-use adjustment involves zoning, subdivision regulations, building and housing codes and administrative policy concerning the extension and construction of utility and other public facilities. A combination of these methods is desirable for effecting maximum security from flood damage.<sup>3</sup>

Sanford Farness, Professor of Urban Planning at Michigan State University, participating in a conference on Natural Resources at the University of Massachusetts, had the following to say.

In order to attain humanized landscapes and create livable urban areas, we are going to have to not only revise our modes of cognition, but to consciously unify what we now call urban planning and resources planning which we still treat largely as separate activities.<sup>4</sup>

Each of these writers has emphasized the need for coordination of resource and urban planning efforts.

<sup>2</sup>Ibid., p. 165.

<sup>3</sup>Harriet Holt Cooter, "To Stay Out of Floods," The National Civic Review, Vol. L, No. 10 (November 1961), p. 1.

<sup>4</sup>Sanford Farness, Man-Environment Problems in an Urban Age, Proceedings of the Conference on Natural Resources sponsored by the Cooperative Extension Service and the Conservation Foundation, New York (Amherst: University of Massachusetts, 1963), pub. 410.



The logical first step toward coordination is to determine how each of these planning fields has evolved and what problems exist for each. The next step is the search for a conceptual framework comprehensive enough to encompass both of these fields. Research efforts indicate that ecology has the greatest potential for resource and urban planning.

Once the unified conceptual framework was developed it was necessary to indicate how it could be used as a tool for coordinating the two fields. The components analyzed in the existing situation were used and the ideas from the conceptual framework applied.

The final step was the summing up and the development of recommendations for other persons interested in the topic.

In summary the thesis includes:

1. A study of the evolution of the two fields of resource and urban planning and their joint efforts.
2. Understand the existing situation of both fields and the present integrated efforts.
3. Ecology as a conceptual framework.
4. Ecology as an integrating conceptual framework.
5. Conclusions and recommendations.

## CHAPTER I

### EVOLUTION OF RESOURCE AND URBAN PLANNING IN THE UNITED STATES

Before dealing with the problems and possibilities of integration of Resource and Urban Planning, it is important to understand how the two fields evolved and to examine the integrated efforts which have been developed by the two fields. This will set the stage for an understanding of the present situation. This chapter begins with an analysis of the Resource Planning movement in the United States starting with the era of the Indian and the Early Settler, progressing through the Agrarian Dream, the Romantic View, the Transcendentalist or Naturalist, the Pioneer, the Conservation Ideology and ending with the Planned Society. This is followed by an analysis of the evolution of the Urban Planning movement in the United States starting with the Colonial Pattern era, progressing to the Young Republic, the Utopian Era, The Age of Steam and Iron, The Awakening era, the city as a way of life and closing with the Regional City.

The last major section of the chapter will describe efforts which are neither purely Resource Planning or purely Urban Planning, but which deal with both fields. The analysis of the regional approach to planning considers the evolution of regions, types of regions and some examples. This is followed by a presentation of other integrated Resource and Urban Planning efforts.

#### Resource Planning in the United States

The problem of determining a starting point for analyzing these planning movements was determined by evolutionary longevity of each movement. In this instance the resource planning movement was chosen first because it was this movement which, if liberally interpreted, was practiced by the Indian in this country. By starting from what seemed the

first beginning of any of the movements it was felt that no phase or era would be left out and that a comprehensive coverage would be obtained. The resource movement then begins with the Indian and the Early Settler.

The Indian and the Early Settler - The Indian represents the man-nature "oneness" living. Here is man who felt that the corn, fruits, roots, fish and game and woods were a gift to him from the great Mother Earth. The Indian had no conception of what man-made boundaries to land were. Alien to this belief was the white settler on this continent. The white settlers were from a culture in which estates and baronies were an indication of status and the very base of society. Into this environment they projected themselves and their culture. To the Indian the idea of selling land was pure nonsense. He really had no idea of what land was his because it had never really been delineated by a boundary. The great Indian chief, Tecumseh, once replied to white buyers, "Sell the country? --- Why not sell the air, the clouds and the Great Sea?"<sup>1</sup>

The end result was the Indian's failure to resist white technology. To obtain the many utensils and other things which the white man brought to this country, the Indian began to allocate land which he never really felt was his. Thus, the transition from a feeling of "oneness" with nature to treating nature as an inexhaustible commodity came about.

The Agrarian Dream - The thinking of the early colonists in general, and of Thomas Jefferson in particular, is a corollary to this philosophy of the function of land. Jefferson dreamed of a country that would be a rural nation thinly populated by small farmers. Each would carve his niche in nature and fulfill his life's ambitions and dreams in an agrarian environment. Jefferson once wrote,

While we have land to labor then, let us never wish to see our citizens occupied at a workbench, or twirling a distaff ... The

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<sup>1</sup>Udall, op. cit., p. 8.

mobs of great cities add just so much support of pure government, as sores do to the strength of the human body.<sup>2</sup>

A direct reflection of Jefferson's desire to fulfill this agrarian concept was the purchase of the great Louisiana area in 1803.

But the agrarian dream was to fade in a cloud of dust and smoke.

"It was at this time that the Whig party was advocating internal improvement designed to utilize the natural resources, while the Jacksonian Democrats were favoring Western civilization and a cheap land policy."<sup>3</sup> At this time the country was caught up in a move of continentalism which was striving for economic self-sufficiency and independence of the American Continent.

This is probably part of the reason for the raid upon resources made during the early 1800's. The forests were the first to reflect this raiding but other resources such as oil, gold, topsoil and wildlife were unmercifully taken. The code of the day in most instances was that each individual had the right to do as he pleased.

Dust from the pioneer movement across the Appalachian Plains into the West, and later smoke from the industrial revolution began to roll across the country. One complemented the other. The pioneer found new resources from which mushroomed new industries and the rush was on to expand the economy of the country.

The Romantic View - Amidst the dust and smoke arose a group of people who were called the romanticists or, in some instances, the white Indians. Before being shrouded by the ominous smoke clouds many Americans became sentimentalists about the Indian and about the resources which were being exploited unmercifully. Artists and writers appeared on the scene painting and penning the wondrous works of nature and the Indian in America.

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<sup>2</sup>Arthur A. Ekirch, Man and Nature in America (New York: Columbia University Press, 1963), p. 18.

<sup>3</sup>Ibid., p. 35.

It was during this time that such figures as Daniel Boone, Jed Smith, Kit Carson and other mountain men became famous in America. It was Boone who said,

I had much rather possess a good fowling piece, with two friendly Indian companions, in quest of a herd of buffalo or deer, than to possess the townships or to fill the first executive office of the State.<sup>4</sup>

But the tide would not be turned, and before the Civil War many of the larger American cities were already dirty, unattractive, overcrowded and unsanitary. It was during this period that some effort for city parks and city planning, through such men as Olmsted and Downing were started and developed, but for the most part these efforts for some semblance of nature in the city fell on deaf ears.

The Transcendentalist or Naturalist - By 1850 very few dared to think of man living in conjunction with nature. But, a stir on the conscience of men came from a group which is identified as the transcendentalist or naturalist. This school of thought included such men as Bartram, who recorded much of the early knowledge on flora and fauna in America; Audubon, who identified birds and wrote many articles and books on the subject; Francis Parkman, who lived with the Sioux for a while and traveled extensively through the West recording his images, and who later became famous for his books and writings on what he observed.

The transcendentalist may be identified for his philosophy which was to divorce himself from the materialistic goals of an increasingly industrial society and to utilize a more scientific approach to the use of natural resources. The movement can best be visualized through its two most influencing individuals, Henry David Thoreau and Ralph Waldo Emerson.

"Thoreau rejected the idea that the affairs of men should be centered on getting and spending, just as he looked with misgivings on the growing domination of the landscape by the engines and establishments of the

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<sup>4</sup>Udall, op. cit., p. 30.



industrial revolution."<sup>5</sup> Thoreau felt that man was spending ridiculous energy on business for progress while these energies could be released in the natural area for more benefit to mankind. Nature was a guide to man's action and once man rejected nature, he rejected the law or guiding light for a fruitful life. Thoreau is best known today for his descriptive writings about Walden Pond.

The other outstanding American transcendentalist is Emerson. "Both men held that what is right is the conformity to the laws of nature as far as they are known to the human mind."<sup>6</sup> Emerson asked that Americans drop the old world ways and strike out on a way which stressed man-nature harmony. "All nature, Emerson urged, was a unity in which man as an observer played his part—observer being fused with the observed."<sup>7</sup> Emerson's best work was his book entitled Nature.

In summary, the transcendentalist started a new school of thought based on a new American nature consciousness. They also set into motion a strong counter-current of ideas against the raider spirit of the era. These ideas were to trigger off a chain of reaction which encouraged other men of action to continue to strive for a harmonious man-nature unity.

The Pioneer - Emerging from the transcendentalist era came George Perkins Marsh, who might be considered the pioneer of a conscious, well-balanced man-nature environment. Marsh offered a transition period from the era of naturalist to the dynamic era of the conservation movement, discussed later, to take place in the country. "Marsh felt that man was part of the cycle of nature and the fall of a sparrow or the falling of a tree should be studied in the context of the total environment."<sup>8</sup> Marsh viewed the naturalist, the politician, the geographer, the humanist, etc. in one

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<sup>5</sup>Ibid., p. 49.

<sup>6</sup>Ekirch, op. cit., p. 52.

<sup>7</sup>Ibid., p. 49.

<sup>8</sup>Udall, op. cit., p. 81.

framework working toward the unification of man and nature. Marsh did not completely condemn the technological advances being made in the country. He felt that, in some instances, they were beneficial to nature as well as to man. "He stressed that conservation be initiated in a framework of political and moral reformation which would apply technology as an aid in conservation." <sup>9</sup>

The Conservation Ideology - The time of action can be traced directly to the Theodore Roosevelt-Gifford Pinchot administration. However, preceding them were such men as Carl Schurz and John Wesley Powell. Schurz was Secretary of the Interior in the Hayes administration and brought to the public attention the needless stealing and wastefulness of forestry practices in the country. He called for a saving of the forests before they were rendered useless. John Wesley Powell gained prominence in this country through his many geologic surveys and for his survey, Report on the Lands of the Arid Region of the United States. It was this report which stressed the need for a law regarding water rights—the political and moral fiber asked for by Marsh. As first Director of the United States Geological Survey, Powell was in a strategic position to expound his ideas and workings.

Both Powell and Schurz contributed strongly to the ideology of conservation, but the challenge can best be portrayed through the efforts of Gifford Pinchot, sometimes called America's first forester. Pinchot arrived on the scene prior to the election of Theodore Roosevelt. At this time he found himself under the Division of Land, Department of the Interior, with a small and limited budget. With the election of Roosevelt, the Forestry Department was moved to the United States Department of Agriculture with the specific designation of Division of Forestry and with a much more substantial budget. "Under Pinchot's capable leadership a total of 132,000,000 acres of forest reserves were set aside." <sup>10</sup> He also stimulated

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<sup>9</sup>Ekirch, op. cit., p. 77.

<sup>10</sup>Udall, op. cit., p. 105.

a strong nationalist pride with the establishment of such things as Arbor Day. His research efforts led to the concept of sustained yield, an essential factor in the management of our forest lands.

Pinchot was to serve as a moving force with, not behind, President Theodore Roosevelt. In the Roosevelt era came such things as the Reclamation Service, Inland Waterways Commission, Conference of Governors on Conservation, Joint Conservation Conference and the National Conservation Association.

At this point it is necessary to point out two ideas which were conceived and were manifested in the conservation movement. We find the conservation movement split into two groups, those favoring planned and scientific use of natural resources and the lovers of nature. What we have visualized from the Roosevelt era, in particular, is the conservationist who advocated the kind of efficiency and scientific management which they believed could be best achieved through government regulation and control. Basically, the split was between those people who had the idea of conservation-for-use (Pinchot) and those people who encouraged the park concept of scenic preservation (Muir).

But, toward the end of the Roosevelt Administration, Pinchot expressed a concept which would encompass both ideas within one holistic framework.

Suddenly, the idea flashed through my head that there was a unity in this complication—that the relation of one resource to another was not the end of the story. Here were no longer a lot of different, independent and often antagonistic questions, each one its own separate little island, as we have been in the habit of thinking. In place of them, here was one single question with many parts. Seen in this new light, all these separate questions fitted into and made up the one great central problem of the use of the earth for the good of man—CONSERVATION.<sup>11</sup>

Since we have identified the split in the philosophical thinking of conservation, it is necessary to identify the movement of the nature lovers.

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<sup>11</sup> Ibid.

Perhaps, the most prominent is John Muir. Muir walked the United States and wrote of its magnificence and natural beauty. Muir became a "senator-at-large" advocating the conserving of America's outdoors in the form of National Parks. He played a vital role in securing Sequoia, Yosemite, Mt. Rainer, Crater Lake, Grand Canyon and Olympia National Parks. He formed the Sierra Club to seek out and conserve natural beauty. His vitality and resourcefulness were responsible for many of our National Parks today, as well as the monumental parks and places.

A period of dormancy was brought on by World War I and by the depression of 1929. But, after this era came the highly dynamic movement we shall identify as the Planned Society.

A Planned Society - In a sense, the great depression was a bill collector sent by Nature. In 1933, the second wave of conservation began under the administration of Franklin D. Roosevelt.

Franklin Roosevelt believed it was necessary to put the physical development of the country on a planned basis, and he created a National Resources Planning Board to make a comprehensive analysis of all resources and to frame plans for their use and development.<sup>12</sup>

The New Deal tied together many ideas. Conservation and reclamation were tied to the idea of rural resettlement, while the Tennessee Valley Authority was tied to the idea of cheap electricity (Rural Electrification Administration), flood control and other natural resource ideas.

The economic and social needs of the country gave impetus to many of the conservation projects and ideas of the New Deal. Natural Resources and their conservation were enhanced by such organizations as the Civilian Conservation Corps, Agricultural Adjustment Act, Soil Conservation Service and many others. Each of these wrote a chapter in the conservation movement.

One of the largest movements, which should be recognized during the New Deal period, is the land use planning efforts. The New Deal of

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<sup>12</sup>Ibid., p. 145.

President Roosevelt ushered in a new role for the United States Department of Agriculture. The new role pertained to the development of action programs to improve the rural situation. The Agriculture Adjustment Act, mentioned previously, was placed into effect with the basic job of controlling certain farm commodities on a limited basis, thus offsetting the depression effects on food prices. An AAA planning division was formed at the National level and planning endeavors were carried out at the local level by County AAA committees representing the various agricultural enterprises of the County.

During the early phases of the New Deal it became apparent that many of the agencies created to meet the needs of the depression were working at cross-purposes to each other. There were no set policies or goals to be found, thus the person at the local level had very few guidelines for development.

To rectify this, the Mt. Weather Agreement was formulated in 1938 at Mt. Weather, Virginia. This agreement brought together the United States Department of Agriculture and the land-grant colleges and universities. The agreement established a framework within which federal and state agencies could work together on land use planning. This agreement established an Agricultural Land Use Planning Committee at the county level with the extension agent serving as coordinator. This committee correlated land use plans, programs and policies for the local level. These efforts were coordinated through a state level committee which included the Director of Extension, Director of the Experiment Station, the Chairman of the AAA State Committee, the Soil Conservation Service State Coordinator, the Farm Security Administration State Director, the Land Use Planning Specialist of the Bureau of Agricultural Economics, a Forest Service representative and any other State or Federal Official with responsibility for management of land use and a number of farm people representing farming areas of the state.



At the National level the Bureau of Agricultural Economics was given the responsibility of planning all agricultural programs.

Land use planning problems were not specifically viewed by the county committees. They expanded their efforts to consolidating schools, developing adequate fire protection, establishing recreational programs, building roads and bridges and developing other public works.

Funds were discontinued for the program in 1942. The program itself continued on a curtailed basis from 1943 to 1955 under State Extension Service sponsorship. In 1955, a new program was started entitled "Program Projection." In 1958, a program entitled, "Resource Development" was started and finally, in 1961 the present program of "Area Resource Development" was initiated.<sup>13</sup>

But most of the programs of the new deal were to be challenged by many who saw an ominous socialistic cloud creeping into the government. This is brought out most emphatically by Rexford G. Tugwell in an article entitled, "A Planner's View of Agriculture's Future." He referred to the many national programs during World War I and the Depression and how these programs affected the general interest and developed machinery for maintaining the integrity of all the parts of a balanced whole. Most of these programs were dropped during World War II and as a result, any planning efforts of national scope were curtailed. Tugwell visualizes the phasing out of the programs:

It has to be recalled that there are not many even yet who recognize that a national organism without an institutional mind or higher nerve centers is a kind of horrible Frankensteinian monster whose casual and brutal wallowing will certainly create catastrophe.<sup>14</sup>

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<sup>13</sup>Many of the ideas on Land Use Planning were taken from a term paper prepared by Kaye F. Bartlett entitled, "Land Use Planning, Its Beginnings." Prepared for the Department of Resource Development, Michigan State University, East Lansing, Michigan. 1962.

<sup>14</sup>Rexford G. Tugwell, "A Planner's View of Agriculture's Future," Journal of Farm Economics, Vol. XXXI, No. 1 (February 1949), p. 41.

Tugwell carried his idea somewhat further:

The guess may be hazarded that people in this democracy simply have not yet made the connection between their fears and the source of them—or for that matter between their hopes, such as they possess, and a firm and understood program for achieving them. They are therefore open to persuasion that men who want balance are 'crackpots.'<sup>15</sup>

The people to whom Tugwell referred challenged the many movements and ideas of national planning and eventually curtailed the movement.

The conservation approach can be found in the recent studies of the Outdoor Recreation Resources Review Commission, but conservation ideas can also be found in these words of the late John F. Kennedy:

We must do in our own day what Theodore Roosevelt did 60 years ago and F.D.R. 30 years ago: We must expand the concept of conservation to meet the imperious problems of the new age. We must develop new instruments of foresight and protection and nurture in order to recover the relationship between man and nature and to make sure that the national estate we pass on to our multiplying descendents is green and flourishing.<sup>16</sup>

### Urban Planning in the United States

The historical sketch of resource planning has noted several ideas which were closely related to urban planning. In the Romantic View era for example, Olmsted and L'Enfant are mentioned with their ideas on park development and planning. In the Planned Society era there was the idea of conservation and reclamation being tied to the resettlement program. These are illustrations of some urban planning efforts. The next sections of this chapter then will consider the evolution of Urban Planning in the United States.

The Colonial Pattern - This period roughly encompasses the earliest efforts of the colonist in this country. For the most part, settlement was found only along the Atlantic shore and these developments were dependent very heavily on water transportation.

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<sup>15</sup> Ibid.

<sup>16</sup> Udall, op. cit., Introduction, XIII.

"The first example of physical planning efforts in the colonies was the laying out in 1638 of the New Haven Colony in the form of nine squares."<sup>17</sup> Around 1680 several courthouse squares were found in many of the communities. "It was during this time that plans were developed for Charleston, South Carolina (1680), Philadelphia (1682), Annapolis (1694) and Williamsburg (1699)."<sup>18</sup>

Philadelphia, the image of William Penn's open-spaced city with green squares placed throughout the city, was an example of planning efforts that, toward the end of this period, were beginning to falter.

Delightful as the city must have been in 1776, with its paved streets, its trees and the 500 public water pumps, we must not let the distance of the past offer too rosy a picture or too great a contrast with the city of the present. By the eve of the revolution, the historian, Carl Bredenbaugh, reminds us, Philadelphia had assumed the appearance and something of the ugliness of any prosperous and rapidly growing city.<sup>19</sup>

The Young Republic - During this period new cities and towns were being founded inland. These towns reflected the cultures of the time, as expressed in the following quote: "Each community form (a town, city, etc.) was unique just as the age, which the anthropologist calls 'culture' was unique."<sup>20</sup>

This was reflected again in the new west where the towns were formed in some instances for defense, but in most instances the towns were forming for such economic reasons as commerce, manufacturing of natural resources or certain political reasons.<sup>21</sup>

Another prominent feature coming from this era was the college towns in the East and South.

<sup>17</sup> Christopher Tunnard and Henry H. Reed, American Skyline (New York: Houghton Mifflin Company, 1956), p. 40.

<sup>18</sup> Ibid., p. 41.

<sup>19</sup> Ibid., p. 48.

<sup>20</sup> Conrad M. Arensberg, "American Communities," American Anthropologist, No. 57, p. 1144.

<sup>21</sup> Richard Nelson and Fred Ashman, Real Estate and City Planning (Englewood: Prentice-Hall, Inc., 1957), p. 17.

Probably one of the most outstanding features of the urban planning movement is the grid pattern of street development. Most of the cities and towns of this period were laid out within this framework. During this period Thomas Jefferson and George Washington called upon L'Enfant to design the foundation for the capital of the country. L'Enfant used the basic grid street design with circular spaces and radial streets overlying the basic grid pattern. "Following this example came many cities such as Detroit in 1805, Cleveland in 1797 and Buffalo in 1799."<sup>22</sup>

Another important feature during the 18th century was the appearance of resorts around the central cities. These resorts appeared due to the transportation media being developed, the turnpike or in special instances a ferry service. These resorts, however, were very small and were patronized by the wealthier people attempting to escape the summer heat.

The Utopian Era - The cry was for land speculation and quick industrial development to aid in pushing more land onto the market. Transportation was becoming better and faster with the canal, the horse-drawn omnibus and a crude form of the railroad. Just as we found the romanticist in the resource planning efforts, here we find a group of people opposing this great landslide. They carried out utopian town developments which stressed beauty and a town-form expressive of man. The most prominent examples are Salt Lake City, Utah, founded by the Mormons, and Onieda, New York.

Robert Owen, the successful Scottish mill owner, was convinced that man is the creature of surrounding circumstances, that his character is made, not by him, but for him. The logical conclusion to this, Owen decided, was to raise the character habits by improving living and working conditions.<sup>23</sup>

Thus from these romanticists came some form of beauty in their town developments.

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<sup>22</sup>Tunnard and Reed, op. cit., p. 191.

<sup>23</sup>Christopher Tunnard, The City of Man (New York: Charles Scribner's Sons, 1953), p. 74.

The Age of Steam and Iron - Giant of this era was the railroad, which received tremendous impetus for development from the Civil War. New towns sprang up because of the railroad, and existing towns were invaded by the railroad with little respect for land use. The railroad carried goods into the city and, in some instances, it carried people who were to inhabit the city and work in its factories. It was in this period that the tenement houses were built to house the laboring people cheaply. These were intolerable structures built with little respect to decent living, with inadequate light and air or proper sanitary facilities. "In 1867 the first tenement law was passed by the state legislature of New York, but it was carelessly enforced."<sup>24</sup>

One bright spot showed around the early 1860's—the development of city parks. The primary mover was William Cullen Bryant who led the campaign for Central Park in New York City and Frederick Law Olmsted who in 1859, designed the park.

Olmsted saw that urban design should include the whole city and provide diverse and continuous enclaves of open space, green gardens and public playgrounds. His aim was to suit the city to the individual and not vice-versa, and perhaps his achievement of a healthy balance between the works of man and the works of nature in an urban setting is his most durable monument.<sup>25</sup>

The Awakening Era - During this era transportation was greatly changed. The railroad developed rapidly and suburban communities prospered. During this period came the model company town which is characterized by Pullman, Illinois and others.

Immigrants flooded the city, and slums were prevalent. "Because of this the 1879 tenement law was passed which stressed tenement buildings—the 'Dumbbell' tenement."<sup>26</sup> "Following this came the work of Alfred

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<sup>24</sup>Tunnard and Reed, op. cit., p. 101.

<sup>25</sup>Udall, op. cit., p. 63.

<sup>26</sup>Tunnard and Reed, op. cit., p. 133.

Treadway White and the Improved Dwelling Association, through whose incentive decent housing was built in Brooklyn and in Manhattan between 1878 and 1880."<sup>27</sup> "The passage of the 1901 law on housing developed wider lots, and more open space was encouraged."<sup>28</sup>

In this same period the City Beautiful Movement occurred in this country. The Columbian Exposition of 1893 made people in America aware of civic pride and beauty. This movement was due to the efforts of Frederick Law Olmsted and Daniel H. Burnham. The L'Enfant Washington plan was revised by the McMilland Commission, and the Commercial Club of Chicago asked Burnham to prepare a comprehensive plan for the Chicago region. City planning was recognized, and planning efforts began to be realized across the nation.

The City as a Way of Life - The city as a way of life was accented by the building of skyscrapers and the development and mass production of the automobile. During this time land speculation took place in Florida. Also the Federal Aid Road Act for highway development was passed.

It was during this period that the Garden City Concept of England was manifested in the United States with such developments as Radburn, New Jersey and Shaker Heights, Ohio.

"Zoning was initiated in 1916 in New York City and the Port of New York Authority was established in 1921."<sup>29</sup> Along with legislative action came the movement for ousting the "boodlers" and putting efficient, trustworthy people in government positions. The depression of 1929 left many cities bankrupt and dependent upon adequate management and leadership. This basically set the stage for the planning efforts which evolved in the next era.

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<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

<sup>29</sup> Ibid., p. 171.

The Regional City - The regional city era began with the administration of Franklin D. Roosevelt. During Roosevelt's administration emphasis was on building of highways and government guaranteed mortgages. Both of these programs stimulated growth of the suburbs.

Physical planning ideas were faced with a regional problem of both physical and natural phenomena. During this time the Federal Government gave momentum to municipal planning and was consciously aware of the importance of the city through the working of the Natural Resources Planning Board.

Following the War, suburbs mushroomed and people were living in what was still considered country towns or for urban planning efforts, the regional city.

Today, urban planning efforts have been given more impetus with programs such as urban renewal and various financing efforts guaranteed by the Federal Government. Many agencies are involved in these efforts.

#### Resource-Urban Planning Efforts in the United States

The idea of the regional city introduces the last sections of this chapter which will deal with regions and integrated efforts between the two fields of Resource and Urban Planning.

There are basically two ideas expressed in regard to resource-urban planning. The first is concerned with regions and was chosen because of its usefulness in grouping man-made areas and natural areas. The second is concerned with integrated efforts which illustrate organizational efforts.

Regions - What Are They? - Regions are very difficult to define. They have been delineated in many ways and by many people. There seem to be three principal ways in which regions can be defined.

1. Indefinite areas - These are regions upon which limits cannot be definitely set. The definitions may read as one large district or a large tract of land, etc. Overall, it is very nebulous and leaves much to be desired for planning efforts. The polar region or the equatorial region would be good examples.

2. Areas set apart by unique but static elements - these are regions defined in concrete terms and efforts. They may be delineated by physical criteria or by human elements. This assumes that these elements are static for the purpose of development of a region. Out of this procedure have come agricultural, climatic, industrial and similar kinds of regions.

3. Areas of dynamic entity - this is a view which sees the region as a dynamic, ever-changing entity, whose interrelated physical and human factors are altered in the course of time. A region is an area with both natural and cultural differentiation from other areas.

Early Regionalism<sup>30</sup> - Regions are not a new concept. Egypt was a nation growing in the region of the Nile Valley. Babylon was built on the irrigated lowlands between the Tigris and Euphrates Rivers. The Greek city-states were in a sense small regions.

In Germany the regional idea appeared around the late 1500's and early 1600's with such people as Cluverius and Varencies. Both were instrumental in developing regional geography. Varenius' book on geography and descriptions remained the standard for a hundred years.

Modern Regionalism<sup>31</sup> - Alexander Von Humboldt, through his studies of the distribution of physical phenomena and the causes of their diversity, prepared the way for regional classification. About the same time, Carl Ritter in Germany was teaching the interdependence of man and nature; his teachings laid a foundation for modern human and regional geography.

The French regional school with such men as Vidal de la Blach, Demongeon, Blunchar and Brunhes made substantial advances in regional work. These geographers realized that the phenomena of cultural differentiation, economic differences and the various interactions could be correlated with topographic factors and with qualities of location and accessibility.

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<sup>30</sup> National Resource Committee, Regional Factors in National Planning (Washington: U. S. Government Printing Office, 1935), p. 141. (Basic ideas taken from this publication.)

<sup>31</sup> Ibid., p. 142.



Particular mention should be made of Patrick Geddes, who fathered the regional survey movement with its synthetic study of organic relationships between city, county and industrial areas.

Regionalism in the United States<sup>32</sup> - Concern for regions and their delineation became evident somewhat later in the United States than in Europe. This country had to be explored and the elements identified before any conscious effort could be undertaken.

Such men as Kinier with his weather maps and Shantz, Zon and Harshberger with vegetation maps, have contributed significantly to regional knowledge of the United States.

The National Resource Committee in 1935 developed some ideas on regionalism in a report entitled, Regional Factors in National Planning. But due to their short-lived effort and their lack of power, the ideas were never carried out. However, regionalism in the United States has been developed and it is necessary to see what efforts have evolved.

Regional Areas in the United States - Regional areas are developed for many functional reasons - finance and credit, transportation, construction, drainage basins and river systems, federal aid, and many other functional purposes.

Probably the best known regional development in the United States is the Tennessee Valley Authority. This authority is endowed with the job of developing the Tennessee River Valley to meet the needs of the people of the area on a social, economic, political and resource basis.

Directly following the establishment of the Tennessee Valley Authority several other authorities were proposed which included the Arkansas, Wabash, Connecticut, Merrimack, Cumberland and several other River Valleys. These authorities did not materialize to any great degree, primarily due to the socialistic image in which the Tennessee Valley Authority had been cast in the late 1930's and early 1940's.

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<sup>32</sup>Ibid., p. 143.

Many regions exist within states. In Michigan, for example, there is the Tri-County Regional Planning Commission consisting of Ingham, Eaton and Clinton Counties, and the Detroit Metropolitan Area Regional Planning Commission consisting of four counties around the City of Detroit. Regions also exist for administrative purposes within the state.

Regions are not new to this country, but they have never fully been utilized or fit into the overall picture of policy development for integrated resource and urban planning efforts. Man is now becoming cognizant of the many existing problems which are slowly bringing the need for some "new" program to be initiated which will seemingly call upon the regional approach.

#### Regions for Resource-Urban Planning Efforts -

Regional planning involves the development of cities and countryside, of industries and natural resources, as parts of a regional whole. It aims to determine, and to enforce by law, rational, ordered policies in the use of specific tracts of land--whether for farm or forest, park or reservoir or settlement, airport or highway or railroad.<sup>33</sup>

The consideration of the region as an area for planning for both fields has never really been settled in terms of boundaries. Many students of the region feel that different systems of regions should be devised for the different phases of activity involved. Others express a hope that one common region can achieve the desired end. The regional idea itself has played a role in joint efforts but its uses for coordinated planning between the two fields has been somewhat limited.

Resource-Urban Efforts - Indirectly, the discussion of some resource-urban efforts has been brought out earlier in this chapter. It is necessary, however, to re-emphasize some of these integrated efforts and indicate other efforts which are taking place.

Probably the most outstanding era was that of Franklin D. Roosevelt and the New Deal. It was during this period that such organizations as

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<sup>33</sup>Ibid., p. 155.

the Tennessee Valley Authority and the National Resource Planning Board were organized. Both of these agencies dealt with both resource and urban problems and components.

The National Planning Board, for example, was organized in 1933 and became a presidential board by executive order in 1934. In 1939, the Board was established by congressional action as a part of the executive office of the president and the name was changed to the National Resources Planning Board. Much of the work of the Board was carried out by technical committees made up of federal agency personnel and other officials and citizens. The Board studied such things as public works, development of natural resources, urbanism, security, work and relief, dynamic economy, demobilization of the Army and overall government management.

The Tennessee Valley Authority, since its conception in 1933, has had as its objectives ideas which are both of a resource and urban nature. The broad objective of the program was to basically improve the physical, social and economic situation of the Tennessee Valley Area. These objectives were met by programs dealing with agriculture, rural life planning, fertilizer research, industrial development, coordination of land planning, housing, education, and training, forestry, soil erosion, power distribution and transportation. Tennessee Valley Authority also actively carried out regional studies, planning for relocated towns, and assistance to Valley cities in urban planning through the states. Many other programs of both a resource and urban nature were undertaken by this agency.

Planning agencies, such as the Tri-County Regional Planning Commission of Ingham, Clinton and Eaton Counties, Michigan, are concerned with both resource and urban problems. A recent water study conducted by the Batelle Memorial Institute for Tri-County analyzed social and economic factors of the area in relationship to water demand and supply. Alternative growth plans were analyzed in terms of water availability and potential water development sites. Tri-County is also cooperating closely with the Corps of Engineers in determining flood areas and problems.

Other planning agencies are working closely with resource agencies in determining land use allocations, growth patterns and other necessary items pertinent to good area development. The Soil Conservation Service for example, is being utilized in some instances for soil surveys and soil sampling to aid in determining urban land use allocation.

The above examples are only a few selected instances, which serve to point out that cooperative efforts have taken place and that a definite wall or barrier does not exist between the two fields of Resource and Urban Planning.

The historical analysis and ideas leads to the next chapter which will be concerned with the present situation in regard to resource, urban and resource-urban planning efforts.

## CHAPTER II

### THE PRESENT SITUATION

In order to understand the present situation of the resource and urban planning fields in the United States, the most logical starting point is an interpretation of the historical evolution of both fields. To understand the evolutionary process better and to develop some ideas of the existing situation the process is diagrammed on Plate I.

The diagram is developed with space represented along the side and time along the bottom. In this instance, space represents those areas delineated by public policy making bodies in the United States.

"Public policy making consists of the means, methods and principles that the government chooses for the attainment of desired ends."<sup>1</sup> Public policy develops through an expression of the popular will and is also developed at all levels of government and within all levels of government. Within each level of government are agencies, bureaus and departments which attempt to develop goals and policies.

This limiting factor was developed because of the major emphasis placed on the public policy making agencies covered in the historical analysis. For the purposes of the rest of this thesis only public policy making agencies will be evaluated. The time aspect of the plate corresponds with the periods described in the last chapter.

From about 1600 to the early 1900's each planning field dealt with different areas with little respect for any integrated efforts. Each field also dealt with its own endeavors and problems. This is brought out more clearly if we analyze the process taking place in this period. Each field was confronted by problems in the real world (by real world it is meant factual problems, not theoretical, academic problems). These problems

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<sup>1</sup> Donald Webster, Urban Planning and Municipal Public Policy (New York: Harper and Brothers, 1958), p. 5.

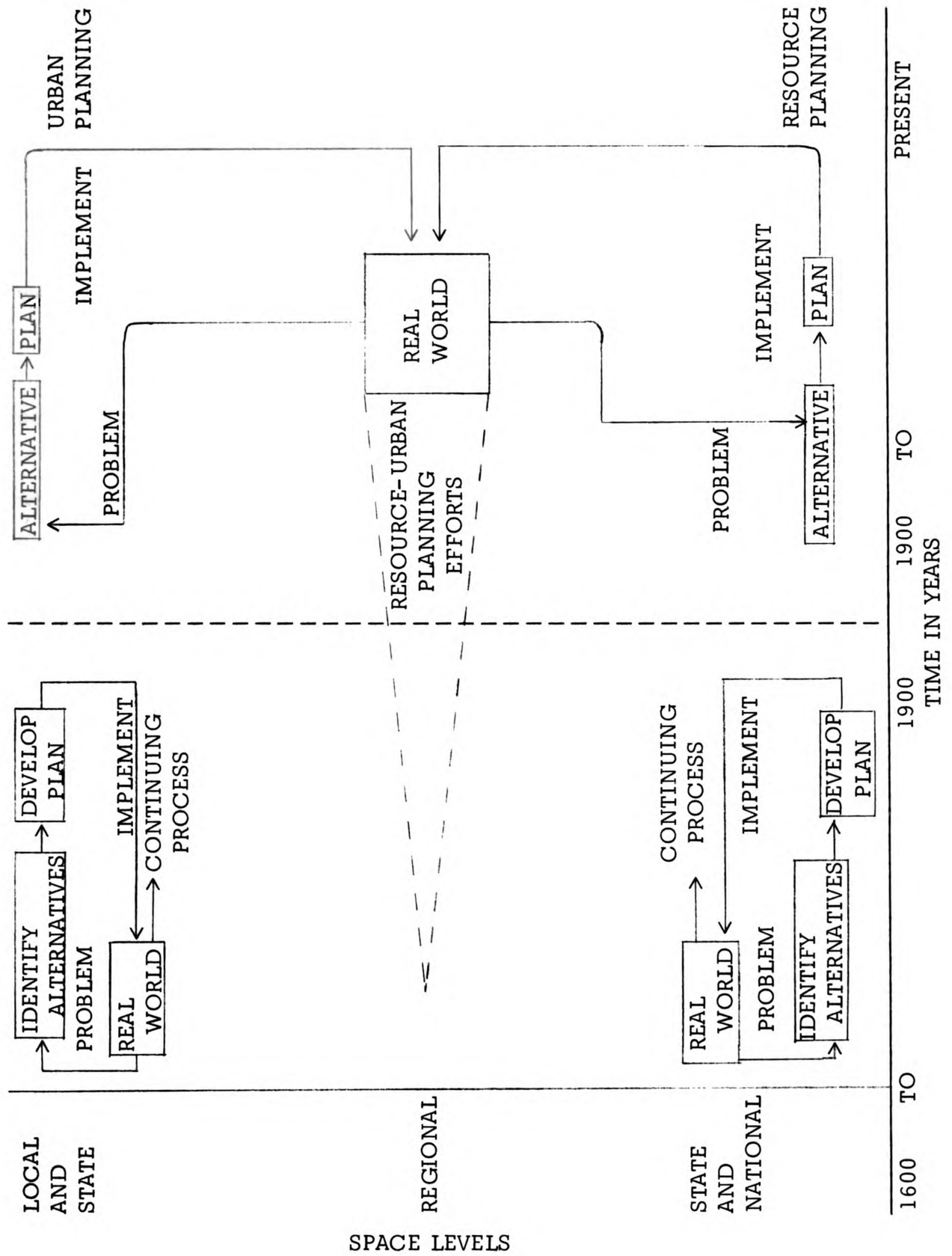


Plate 1. Historical Evolution of the Planning Fields

were identified, alternatives pursued, a plan developed and the plan implemented. Each field went through the same effort dealing with its own particular problem and goals.

After 1900 a new aspect was added to the process of joint planning efforts. The dashed lines before 1900 represent gradual building up of joint efforts. Problems of the real world were seen as common problems by some resource and urban planners but only tentatively. Most problems were still seen as before.

From this discussion, it is possible to visualize the present situation. The primary problem areas differentiating the two fields of planning seem to be:

1. Concern for different elements: The first element is the human which includes families and individuals. The second is the man-made element which is the artifact produced by human beings and the third element is the natural resources, which includes land, water, air, minerals, animals, plants and so on. The following diagram illustrates the emphasis on components that each planning field has had.

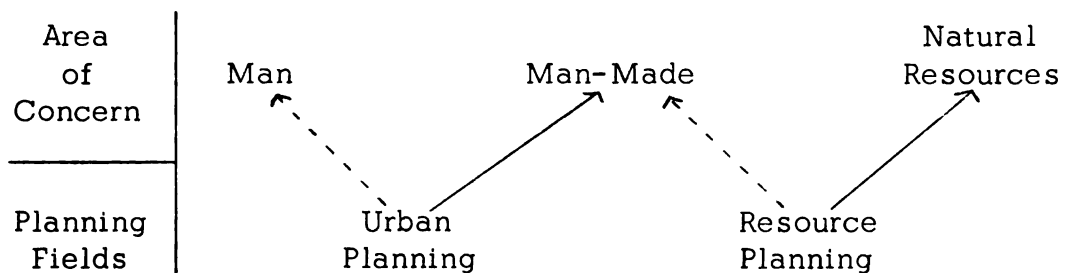


Figure 1. Differing Elements of Concern for Both Fields of Planning

Resource planning has placed major emphasis upon the natural resource element which is indicated by the solid arrow from resource planning to natural resources. The dashed-arrow indicates some emphasis on the man-made element such as dams, oil well towers, etc.

Urban planning has placed major emphasis on the man-made as illustrated by the solid line. Planning has also had some emphasis on the man

element as shown by the dashed arrow and illustrated by sociological studies in the planning process.

2. Differing public policy frameworks: The second broad area deals with the public policy framework of each field. Historically, these fields stemmed from the opposite ends of the public policy continuum. Resource planning started at the national level during the Pinchot-Roosevelt era. Urban planning began at the local level with such efforts as the city beautiful movement, Olmsted and his park development, the New York Zoning Ordinance in 1916 and many housing efforts made on the local level. National entrance into the urban planning field came during the New Deal era in the form of public housing, Federal Housing Authority and Federal National Mortgage Authority and National Resource Planning Board followed by the 1949 Housing Act inaugurating urban renewal and better housing standards. Basically, it has been locally administered.

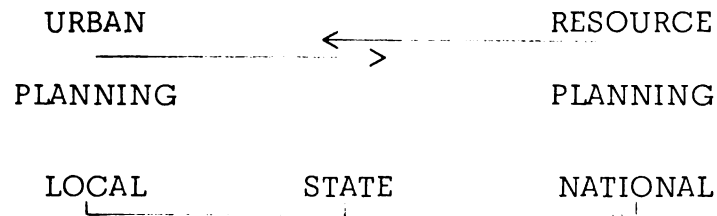


Figure 2. Differing Public Policy Frameworks

These general problems suggest that a more detailed analysis must be performed to thoroughly understand the present situation. The differing emphasis on elements offer some suggestion for attempting to understand the operations of each field. The differing emphasis on policy levels seems to indicate that an attempt should be made to understand the organization of the two areas and their joint efforts. Analysis of education in these fields is also important, since this involves the development of the Professional who carried out the operations and organization.



### A Systems Approach

For a full understanding of the present situation a holistic approach is desirable. In developing a framework in keeping with the holistic idea, a systems approach was decided upon and developed. It was felt that this approach offered the necessary framework for a comprehensive analysis of the existing situation.

System Limits - A system may be the universe with the solar systems as sub-systems, the planets as sub-sub-systems and so on until the most minute object is included. In setting out to do a systems analysis, the very first criteria is to designate and define the systems being dealt with.

In this instance, three systems are being analyzed. They are the resource planning system, the urban planning system and a potential resource-urban planning system. Each of these systems has been defined in the introduction and remain the same for this analysis.

Resource Planning System - A natural resource system is that system containing all those things which combine to form the natural environment. The visible portion is defined as the natural landscape. Natural resources can be visualized as physical, biological and intangible; some blend into the earth's surface, some above it and some below it. The purpose of planning is to maximize these resources for the best human use or the wise conversion of natural resources to commodities.

Urban Planning System - The urban system pertains to the system which makes up towns, cities and hamlets or basically that development which is the cultural environment. Urban planning is concerned primarily with man-made items such as transportation systems and housing and how man can regulate and direct these items into the most desirable living conditions.

Potential Resource-Urban Planning System - The resource-urban system is that system of both the natural environment and cultural environment and their interrelations.

Once the systems have been identified, the subsystem of each system must be identified and defined. In this instance, for each of the systems, the subsystems are the same. They are identified as education, operations, and organization.

Under each of these subsystems are differing components. Each of these components must be identified and defined.

Education: Education is the training of persons through study or instruction to become versed in resource, urban or resource-urban planning efforts. For this study, education is confined to the college level of training.

Under the educational subsystem are four components. These components constitute the four major areas of study in college education.

The first is the physical sciences, which constitute study in physics, chemistry, astronomy, microbiology and health, engineering, statistics and mathematics. The second category is natural sciences, which encompasses biology, ecology, botany, fish and wildlife, forestry, soil science, geology and zoology. The third category is the social sciences, which takes into consideration geography, economics, sociology, anthropology, psychology and political science. The last category is the humanities, which constitutes such areas as speech, journalism, philosophy, religion and art.

Operations: Operations includes the process of preparing plans and carrying them out. In this case it includes decision premises, policies, plans and finally action. These are considered the components and are defined as: Decision premises are assertions or statements of fact or value used in decision making.

Policies are the guides, rules or principles that the government uses in deciding on desired outcomes or actions.

Plans are methods or schemes of action, such as a master plan or a policies plan or possibly a plan for planning. (Discussed in organization section following.)

Action is the conduct or behavior of an individual or group.

Organization is the dividing up of all activities of the public policy agencies which are necessary to any purpose and arranging them in groups which may be assigned to individuals.

The organization subsystem has two components which may be thought of as external and internal components. External basically means that area dealing with agency organization, etc. in planning and internal means plans for planning or staff organization for planning purposes. The internal components are those which deal with organization on the staff level. This is really the organization planning. The external component is concerned with organization of public policy-making groups at all levels.

The framework for the analysis then basically presents itself as:

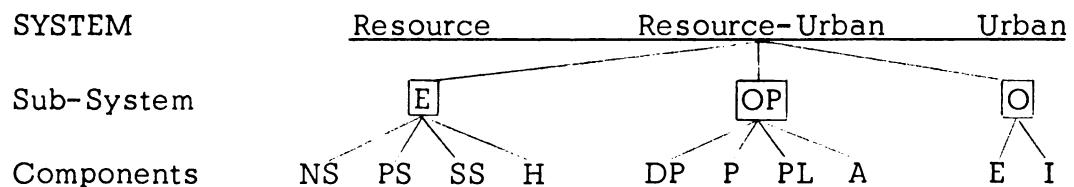


Figure 3. Framework for the Analysis of the Existing Situation

E = Education

OP = Operation

O = Organization

NS = Natural Science

PS = Physical Science

SS = Social Science

H = Humanities

DP = Decision Premises

P = Policies

PL = Plan

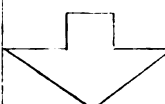
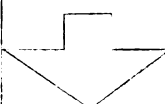
A = Action

E = External

I = Internal

Plate 2 represents an overview of the situation as presented above. In terms of space, the whole United States is considered and all levels of public policy making efforts. Space actually is only concerned with the organization component since the other two components are relatively free from this aspect.

The hierarchy of public policy making efforts in space is shown in the following table and repeated on Plate 2.

RESOURCE PLANNING		URBAN PLANNING	
MINOR WATERSHED AREA MINOR RESOURCE REGION		City, Village, Hamlet Township School District Special District	
		COUNTY	
		METROPOLITAN DISTRICT	
<hr/>			
WATERSHED RESOURCE REGION	<div>Increasing Area</div> 	STATE	
MAJOR WATERSHED AREA MAJOR RESOURCE REGION		INTERSTATE	
MULTI-STATE WATERSHED MULTI-STATE RESOURCE REG.		MULTI-STATE ADM. DISTRICT	
		NATION	

Source: Stewart Marquis, Communities and Planning Areas: A Systems Approach to Spatial Community, p. 19.

Figure 4. Hierarchy of Public Policy-Making Efforts  
for Resource and Urban Planning

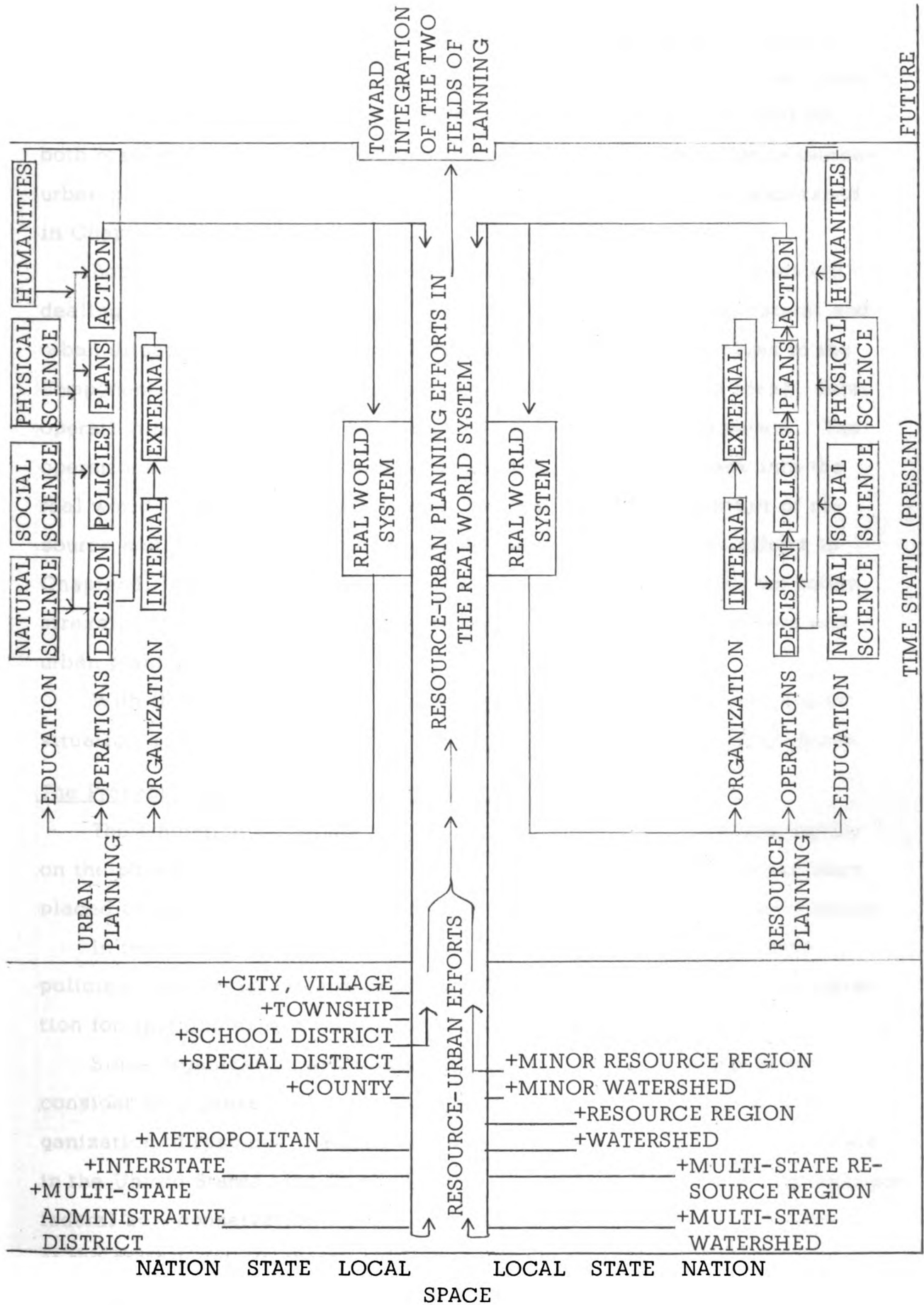


Plate 2. The Present Situation

The time element represents a static period or the present situation except for the far right of the diagram which is concerned with what future joint efforts could be developed. The space hierarchy is developed for both resource and urban planning and is shown interchanging the resource-urban planning efforts as was brought out in the regional ideas expressed in Chapter I.

Both the natural resource system and the urban planning system are dealing with problems in the real world system concerned with natural and urban situations. From the real world system the problem evolves to the components. The organization and education component feed ideas, data, operation techniques and other items into the operations component. The operations component then feeds a solution to the problem back into the real world. Sometimes this action is fed into an integrated effort of resource and urban planning as discussed under resource-urban efforts in Chapter I. The present resource-urban efforts continue on into the future stressing the idea of the goal of this thesis, integration of resource and urban planning.

With this as a framework it was then possible to look at the present situation concerning resource, urban and resource-urban planning efforts.

#### The Present Situation of the Natural Resource System

The education of people to enter the resource field has drawn mainly on the physical sciences and natural sciences. Some emphasis has been placed on the social sciences with a recent strong emphasis on economics.

In terms of operations, resource planning has been making plans, policies, and decisions and carrying out these plans with little consideration for anything except the resource components.

Since organization and space are closely related, it might be well to consider their present situations together. Plate 3 has arranged the organization of resource planning along with the territory with which it deals, in the United States, the State of Michigan and Ingham County. For example, federal soil conservation service operates in multi-state resource regions. At the state level, it operates in minor resource regions which are referred to as Soil Conservation Districts.



### The Present Situation of Urban Planning

Urban planning education has drawn heavily upon the physical sciences and humanities, as shown by the heavy arrow in Plate 2. The social sciences have been drawn upon to a lesser degree. However, along with the emphasis on social sciences, more courses are being taken in economics, geography, sociology and political science.

Operations in urban planning have primarily been making decisions, policies and plans and carrying these plans out with little consideration for anything except the man-made components.

The organization of urban planning, along with the territories of these organizations, is shown on Plate 3. At the national level, there are no organizations for urban planning efforts. The primary emphasis is at the local level, as brought out earlier in this chapter.

### The Present Situation for Resource-Urban Planning

Within the existing educational framework, resource and urban planning students follow separate paths. There is a common interest in the physical sciences and some interest in the social sciences, but little interaction or integration at the very root of the entire process. (Each university dealing with resource and urban planning students may have a different educational situation than the model represents. Some students will choose to fill the gaps by taking courses in areas not required. This part of the diagram is developed to point out the usual differences between the education of resource planning and urban planning students.)

Resource-urban efforts for operations have also been very limited. However, since interest on the part of resource planners has increased in the urban area and vice versa there are some integrated efforts as discussed in Chapter I. Overall, the primary problem for resource-urban operations is that there is no common conceptual or organizational framework to encompass both efforts.

Joint efforts for resource and urban planning organization and territory are shown on Plate 3. They represent not only resource-urban efforts, but



also organizations which are dealing with specifically resource or urban programs.

The problems discussed suggest the need for integration of these two areas. It still remains, however, to understand why integration should be brought about and how.

### Integration - Why!

In the introduction, three persons were quoted expressing a desire that resource and urban efforts be integrated. The quotes may be considered only the ornate facade behind which lie the facts that man is reproducing at a phenomenal rate, the natural resources of the United States are becoming depleted and technological advances are changing the everyday picture constantly. These facts are manifested in such problems as:

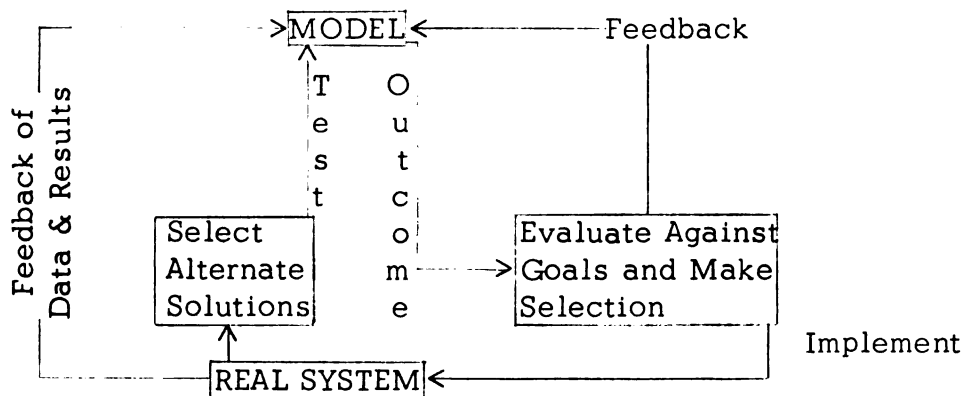
1. Urban building development is sprawling across the countryside, in many instances using up Class I farmland.
2. Urban areas are consuming vast quantities of resources for housing, recreation, transportation and other uses.
3. Lack of water (or in some instances too much water) at the wrong time or in the wrong place.
4. Health problems brought about by inadequate code enforcement or by the inability to meet the demands for adequate health protection.
5. Air and water pollution which is ruining recreational places, endangering health and creating an undesirable wasteland.
6. Worn out land which will take years to replenish and which will add to the depletion of the already strained tax roll.
7. Mental health problems brought about by the tensions, overcrowding and confusion of our cities.
8. An inadequate tax base brought about by poor community development.

An endless list of problems could be compiled. The major point is that something must be done to meet these problems. This thesis has advocated the integration of resource and urban planning efforts as a step

toward meeting these problems. There is some evidence that resource and urban planning are interested in integration. The major issue seems to be how or in what framework, this integration can be brought about.

### Integration - How!

From Plate 2 an idea was developed concerning future efforts of integrated planning. From that basic idea Plate 4 was developed.

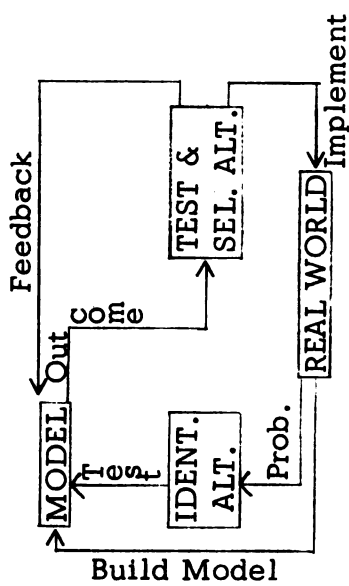


Source: Steve C. Nelson, Urban Regional Policy Planning: A New Dimension

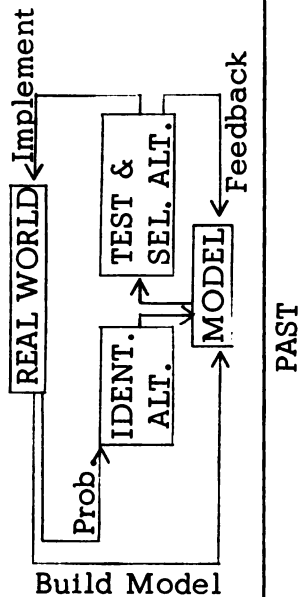
Figure 5. Model for Use in Plate 4 as a Theoretical Approach for Possible Integration

This diagram shows problems coming from the real world. These problems are analyzed and alternatives proposed. After the alternatives are developed, they are tested against the model and a selection is made. This selection is then fed back into the model and also utilized to combat the real world problem.

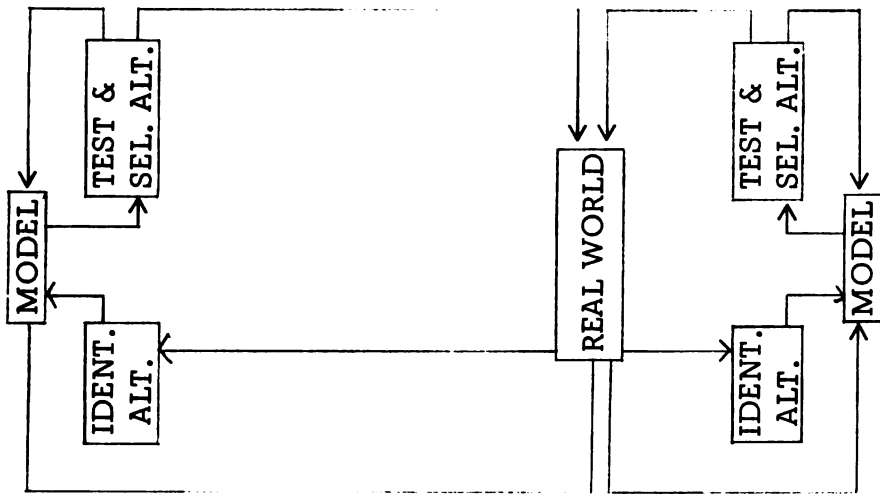
Plate 1 shows the two fields separated. The two fields move somewhat closer in the present situation, with such efforts as were described in Chapter I. The future situation indicates these fields becoming integrated through the use of a common model of the real system. (A potential common model will be developed in the next chapter.)



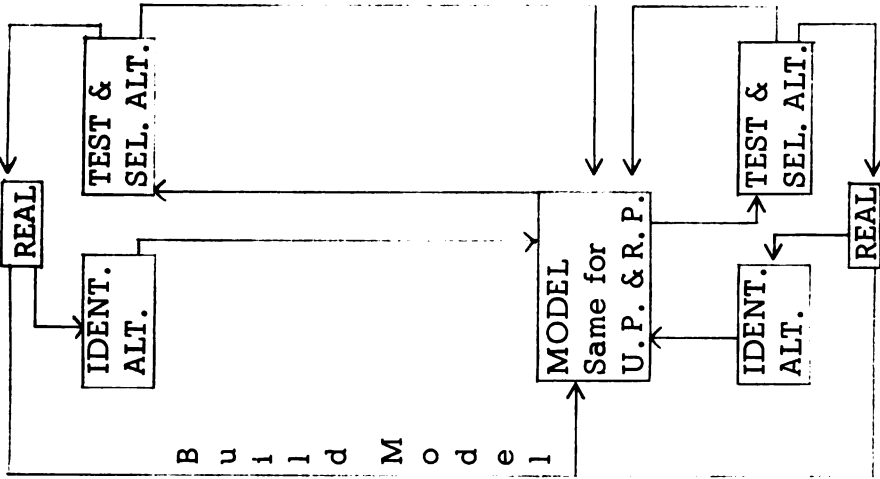
SPACE  
UNITED STATES



Separate "Real Worlds"  
Separate Models  
Separate Planning and Action



Same "Real World"  
Separate Models  
Separate Planning  
Some Integrated Action



Same "Real World"  
Same Model  
Separate Planning  
Integrated Action

Plate 4. Evolution of Efforts in Resource-Urban Planning

### Overview of the Problems

The existing situation can be better evaluated on the basis of an overview of the problems. These problems might be viewed as:

1. There is little educational system or curriculum to effectively educate professionals to enter into the professional world of an integrated resource and urban planning effort.
  - a. There is little coordination between curricula in the two fields.
  - b. The departments offering training in these fields are separated.
  - c. There is no common conceptual model for the two fields.
2. There is little coordination of the operations of the two fields.

In most instances, each has been concerned with only a pure resource approach or a pure urban approach.

- a. This has manifested itself in a lack of coordination between the two fields. (In some instances resources agencies will not coordinate efforts with urban planning agencies doing resource work.)
- b. There has been, in some instances, work at defeating cross purposes. (The Federal Housing Administration, which has responsibility of guaranteeing housing on a long-term, low-interest basis, principally in urban areas, has to some degree been working at cross purposes with the Farmer's Home Administration which has a somewhat similar purpose for farm homes and buildings.)
- c. Plans do not fully comprehend the entire scope of the problems. (The State Soil Conservation Committee has responsibility for development of small watersheds in the State under Public Law 566. These small watershed developments have not anticipated land-use changes brought about by the reservoir.)
- d. Decisions are based primarily on resources components in resource planning and on artifacts in urban planning. (Soil Conservation Service stays purely on a resource basis while some city planning efforts are purely physical in nature.)

3. In terms of organization and territory or space several problems are present.
  - a. There is a lack of any coordinating department to offer guidance for the three sections of resource planning, urban planning and the fields formulating policy which represent both.
  - b. There is a lack of balance and guidance at all levels between the three policy-making sections. This can particularly be attributed to urban planning's development at the local level and resource planning at the national level.
  - c. There are overlapping agencies and departments which are duplicating work. This is particularly evident in the many agencies and departments working with the development and maintenance of recreation facilities.
  - d. There is no continuity of communication between levels.  
(Example: The Soil Conservation Service on the Federal level has a state office in Michigan, but it is different from the State Soil Conservation Committee. The State Soil Conservation Committee assists in organizing and servicing Soil Conservation Districts on the local level.)
  - e. Certain departments and agencies, etc. are expanding their programs to include several factors rather than one. This is causing overlap. Cooperative Extension, for example, is attempting to provide assistance in community development which overlaps with some of the urban planning efforts.
  - f. There is a conflict between natural areas and political areas. In many instances there is no effort to avoid overlapping and conflicting boundary development. (The watershed will conflict with the political boundary.)
  - g. There is little effort to coordinate political boundaries between agencies. One agency may refer to its New England Area, while another may divide the area into two political units or even add still other states on the fringe of the New England Area.

- h. There is no effort to unify resource regions and watersheds. Each agency responsible in this area basically designates its own area of jurisdiction. (The Forestry Department, for example, is entirely different from the Tennessee Valley Authority area.)

## CHAPTER III

### ECOLOGY AS A CONCEPTUAL FRAMEWORK

Earliest man was not confronted with the complex man-nature relationships found today. Then, man was in "oneness" with his environment and depended upon it for his form of life. Nature and man were as one element in the vast whole, a harmonious unity.

Aristotle, in 300 BC, began to classify the phenomena of nature and separate them into several components to be analyzed individually and separately. During the Renaissance, with the expanded drive for individual ideas, this framework of many components, laid down by Aristotle, was expanded even more.

Throughout the ages many ideas have evolved, but until recently man just began thinking of himself as part of a unified whole. This is resulting in the challenging of certain ideas and more specifically, in the emphasis on a unified approach.<sup>1</sup>

#### Ecology - A Unifying Model

The choice of ecology as a common model for resource and urban planning efforts was intuitive on the part of the author. With an academic background in Resource Development and Urban Planning the various aspects of ecology had been portrayed to the author as a student many times. The perception of ecology by the author through academic work had made it a built-in concept which had to be pursued in some conscious effort — the thesis.

From this conscious desire an effort was made to understand ecology and to justify its usage as a unifying field for resource and urban planning efforts.

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<sup>1</sup>Farness, op. cit., pp. 3-10. The author wishes to indicate that some of the general ideas expressed in this part of the thesis were taken from this article.

The first step was to define ecology and understand what the field was concerned with. Ecology is the study of the interrelations of plants and animals with their environment.

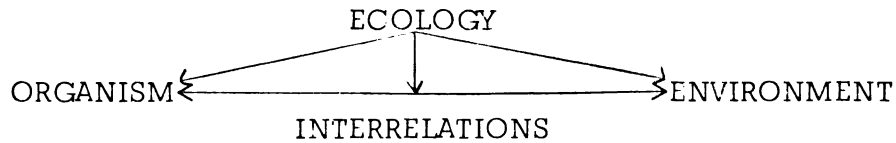


Figure 6. Definition of Ecology

This involves a necessity to have a knowledge both of the organisms themselves and of the environments inhabited by them. Ecology is the study of the structure and temporal processes of populations, communities and other ecological systems and the interrelations of individuals composing these units. (In this instance, man is considered an animal.)

The definition of ecology offered some justification for its use as a unifying field. It was concerned with both the organism and the environment and the interrelationship of the two, which made it an all encompassing effort or an approach based in a holistic framework.

Ecology's relationship to the two fields was somewhat vague, since nowhere in the definition was either resource or urban planning mentioned. It was necessary then to visualize this relationship. To do this the diagram on the following page was developed.

The first step in the diagram is based on definition of ecology as the study of organisms and environment. The next step indicates the common elements dealt with in resource, urban and resource-urban planning — man, man-made and the natural resources (defined in Chapter II).

Organisms, the biotic or living aspect of ecology, are dealt with in all three fields. Man is a natural organism. Plants are included in gardens and agriculture. Man-modified plants and animals are dealt with in cross-breeding, grafting, and so on. Living organisms in the natural resource area include fish and game, trees, soils and other things of this nature.



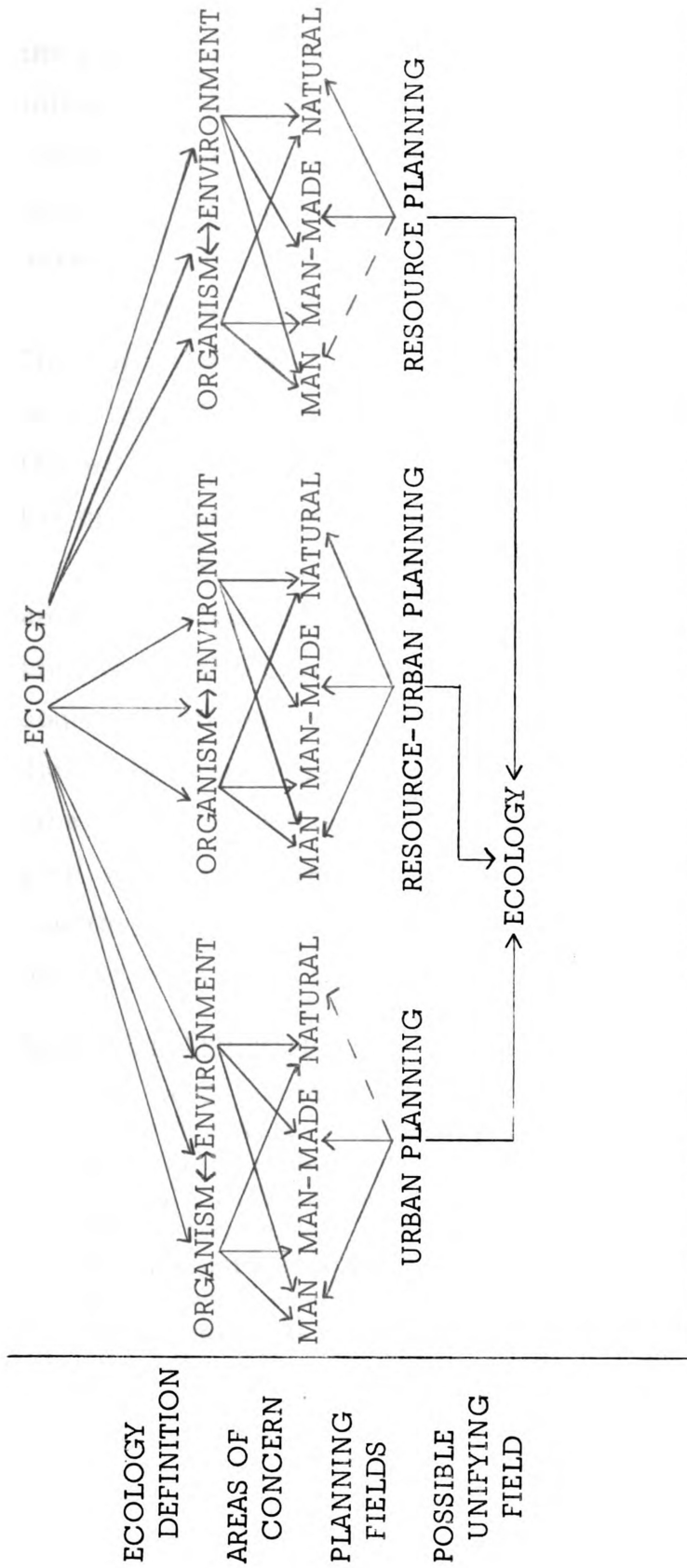


Plate 5. Relationship of Ecology to the Fields of Planning

The abiotic or non-living environment is necessary to man as it offers the physical surroundings which influence man and which man, in turn, influences. This includes man-made artifacts in the environment, and modification of the environment for man's use. The non-living natural resources are concerned with such things as minerals, water and other aspects of this nature.

The three planning efforts have definite ties with these three elements. The major linkages for urban planning are with the man and man-made areas where the urban planners have concentrated most of their work and study (shown by the heavy arrows). The dashed arrow indicates some effort on the part of urban planners in working with natural resources.

Resource planning efforts are strongest in the man-made and natural areas with some attention being given to the man area. Resource-urban planning efforts have attempted to work in all areas, both urban and resource. With this chain diagram, it seemed justifiable to culminate the diagram with ecology as the unifying field for resource, urban and resource-urban planning efforts. Once this was established, it seemed the next step was to understand the evolution of ecology and then to understand how the substantive matter of the two modes of planning fit into the ecological field.

### Ecological Evolution

The word, ecology, comes from the Greek 'Ocho', meaning home or estate — hence, ecology is the study of the home or how the household of nature is kept in order. Interestingly enough, although ecology comes from the same root as our word, economics, the subject we call ecology was not given a name until a century later. Man, being egocentric, began this type of study in his immediate surroundings. Not until long afterwards did he realize that man's economics is but a special case of the broader subject. Ecology is really an extension of economics to the whole world of life. Economics and sociology might be thought of as the ecology of man in a broad sense.<sup>2</sup>

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<sup>2</sup>George L. Clark, Elements of Ecology (New York: John Wiley and Sons, Inc., 1954), p. 3.

To broadly understand ecology, it is necessary to develop a sketch of how ecology has evolved to what it is today. The sketch presented as follows is not meant to be complete, it is only developed to offer some insight into the history of the field.

5th Century BC	Empedocles - plants produce nourishment through pores in stems and leaves, obvious relationship between plants and environment.	Greek and Roman Era
321-322 BC	Aristotle - developed natural history.	
322 BC	Theophrastus - wrote of the communities in which plants are associated and of the relations of plants to each other as well as their non-living environment.	
23-79 AD	Pliny - developed natural history - the starting point of modern formal natural study.	The Dark Ages
1193-1280	Albert Magnus - wrote of plants, of streamside and marshes and of the relation between the habitat of a tree and the quality of wood.  Geographic experiences of Marco Polo and of the Portuguese and the discovery of America forced biologists to turn from authority to the study of the thing itself. A reawakening of science was started, especially as regards the forerunner of ecology.	
1515-1605	Gesner, Aldrovondi and Cordus all started accumulating greater knowledge of local and exotic animals.	16th, 17th and 18th Century
1627-1691	Robert Boyle - first modern chemist, observed the effect of low atmospheric pressure on animals. Resistance of cold-blooded animals.	
1683-1757	Reaumur - was concerned with the conditions of life of insects. He also experimented with their habits of life.	
1707-1788	Linnaeus and Buffon - both men looked at the habits of animals and their adaptations to their surroundings.	

1837-1844	Boassinguielt and Gaspanin - continuing the research work of Linnaeus and Buffon, also looked at the habits of animals and their adaptations to their surroundings.	19th Century Studies
1864	Kuhne - did detailed experiments on animals and their reactions to environmental elements such as oxygen and carbon dioxide.	
1877-1884	Pfeffes and DeVries - worked out many of the essential relations of osmosis for plant cells.	
1881	Sensper - developed ideas of 'Key-industry' animals and worked out in principle what has come to be called the "pyramid of numbers." In this period the ecologists were primarily concerned with the individual species (autecology). Investigators followed either the path of natural history or they entered by the physiological route with studies of the behavior, the development or the toleration of an organism in relation to its immediate environment.	19th Century Studies
1900 to present	<p>Synecological studies (defined in discussion following) also appeared during this time. This lag behind autecology was due to the lack of adequate data. The concept of ecological succession furnished an impetus for synecology because it caused ecologists to view groups from the long-time vantage point of development and maturation. This led to the concept of communities.</p> <p>Quantification also became important during this time and was used in both autecology and synecology.</p> <p>Ecology was applied in insect control and fisheries biology. Such activities as game management and wildlife conservation utilized many of the ecological concepts fruitfully.</p> <p>Ecology was also used to visualize man as an organism and how this organism interacts with the environment.</p> <p>The ecosystem (defined in discussion following) was also viewed during this period as an important overview concept.</p>	1900 to present

The above sketch offers some insight into the basis of ecology. Some of these ideas can be expressed as follows:

1. Ecology is a recent science which stems from the overall field of biology. It overlaps into the other areas of biology. For example, ecology overlaps with such studies as morphology, physiology, genetics, bacteriology, ornithology, mycology and entomology. Ecology and genetics, for example, overlap with studies in population growth forms and the genetic characteristics of certain animals. It should be remembered that ecology is recent only in name, since many of its concepts are based upon the early history discussed above. For example, in the early 1900's some botanists and zoologists were conceiving biotic groupings. Many of their ideas were based on natural history and the discoveries presented earlier. From this stage these men have moved to the idea of community which is an important concept in ecological study. From this example it is easy to see that many ecological concepts are an agglomeration of ideas that have accumulated from many fields and for a long period of time.

2. Ecology depends upon fields outside of biology. Physics, for example, with its various methods of measuring light (which is important for photosynthesis) is important to the ecologist.

3. Ecologists have essentially taken different approaches toward the development of the science. Some ecologists have placed emphasis upon the habitat and its influence on the plants and animals that live there, and this has been termed community ecology. Other ecologists have developed autecology which emphasizes the individual organism and the influence of environmental factors upon it. In other words, it was primarily an individual study approach to ecology.

4. Some ecologists pursued a path which led them to an understanding of groups of organisms. These men followed the idea that the size of a population of a given species of animals or plants and its rate of growth are regulated by the reactions of the members of the population to each other and to the environment. This type of study was defined as population

ecology. Other ecologists pursued a somewhat similar path but dealt with natural communities, containing several organic species. These men found that certain species live together in mutual adjustment and that these formed natural communities. This type of approach was termed synecology.

5. Ecology has been applied in other fields such as human ecology, game management, watershed management and fish management.

6. Ecology, has also developed another strand of effort, the eco-system approach.

Any entity or natural unit that includes living and nonliving parts interacting to produce a stable system in which the exchange of materials between the living and nonliving parts follows circular paths is an ecological system or ecosystem. The ecosystem is the largest functional unit in ecology since it includes both organisms (biotic communities) and abiotic environment, each influencing the properties of the other and both necessary for maintenances of life as we have it on earth.<sup>3</sup>

The concept of the ecosystem is a broad one, its main function is to emphasize obligatory, interdependent and causal relationships.

The ecosystem has four major types of components. First are the biotic substances which are basic compounds such as water, carbon dioxide, oxygen, etc. Second are the producer organisms which are green plants that are able to manufacture food from simple inorganic substances. Third are the consumer organisms, which are those animals, such as insect larvae, fish or cattle which feed on plants and are in turn eaten by other animals. Fourth are the reducer or decomposer organisms, chiefly bacteria and fungi, which break down the complex compounds of dead organisms.

An example of the ecosystem approach can be visualized in the following diagram:

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<sup>3</sup>Eugene P. Odum, Fundamentals of Ecology (Philadelphia: W. B. Saunders Company, 1954), p. 9.

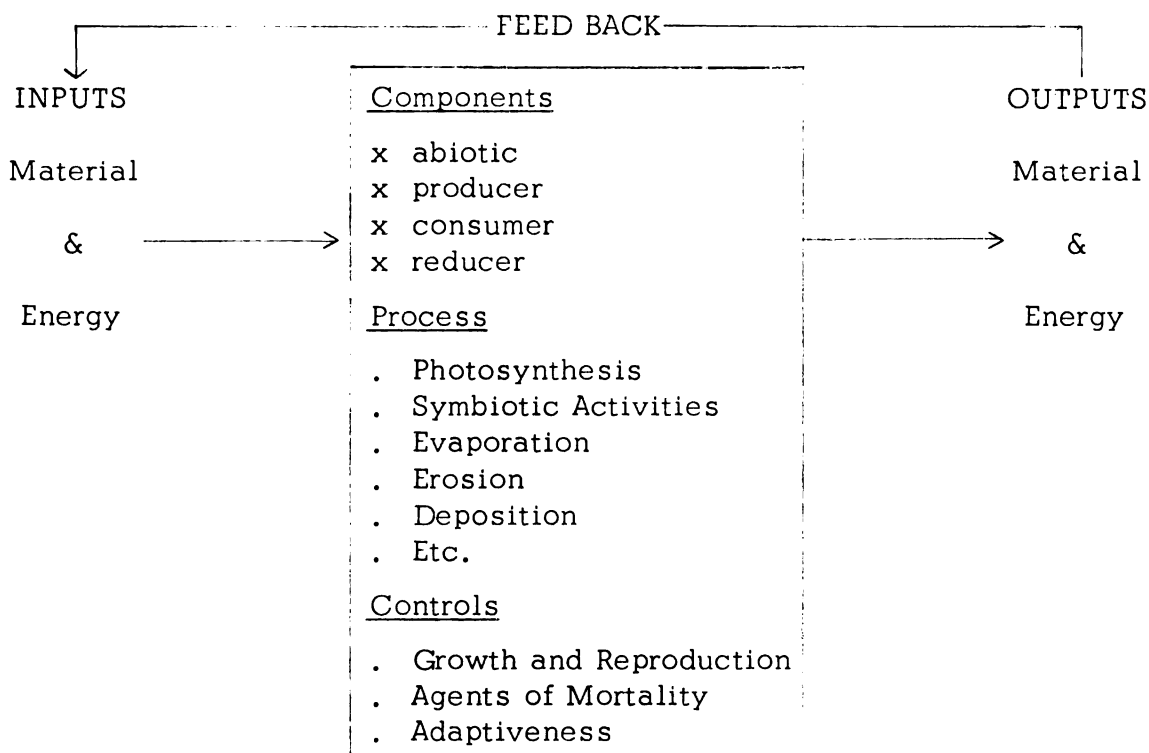


Figure 7. The Ecosystem Approach

Inputs of materials and energy go into the system, where such processes as photosynthesis, symbiotic activities, evaporation, erosion, deposition, etc. take place. The outputs and inputs are energy and materials, but manifested in different forms and quantities. The flows are carried over pathways which allow interaction. The system also has control processes which may consist of such things as growth and reproduction, agencies of mortality, adaptiveness, etc.<sup>4</sup>

#### Ecological Hierarchy or Levels of Organization

Throughout the evolutionary sketch there has been an indication of some hierarchy or levels of ecological organization. There are basically three major levels within the field of ecology. Each is defined and graphically portrayed below:

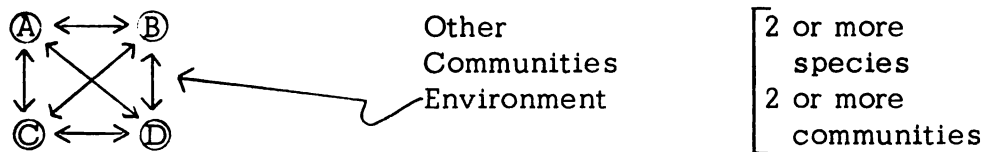
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<sup>4</sup>F. C. Evans, "Ecosystems as the Basic Unit in Ecology," Science (June 1956), pp. 1127-1128. Basic ideas of systems approach taken from this article.

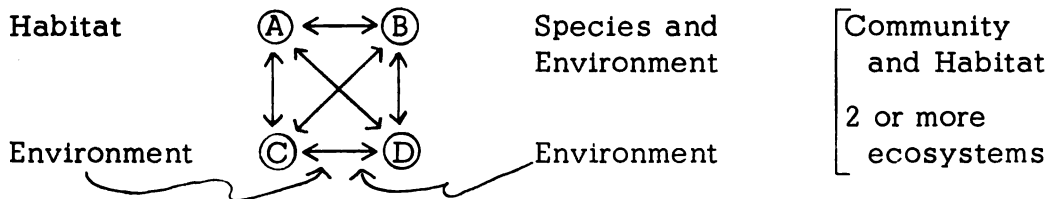
1. Population - There is interaction on an intraspecies basis when members of the same species are involved. This interaction will occur in the habitat or physical environment (population-one species).



2. Community - Two or more species may group together in a mutual working arrangement. These form a community which is a group of mutually adjusted plants and animals inhabiting a natural area.



3. Ecosystem - Two or more species in a community will interact not only species-to-species, but species-to-habitat.



Note: The habitat is a place where a given animal or plant naturally lives or grows. The environment is the aggregate of surrounding things, conditions or influences. The major difference seems to be that the habitat is dealing with a specific area while the environment is wider in scope or more comprehensive.

The hierarchy should not be considered a structured and rigid development. The ecosystem is all encompassing and includes both the abiotic and biotic. For this reason we may have a population (single-species) ecosystem or a community (multi-species) ecosystem depending on the use to be made in a particular study.

### Resource Planning and Ecology

Resource planning has been closely tied to ecological ideas. The reason for this is easily understood by the components each one has stressed. Resource planning has been primarily concerned with the



natural components and with problems of soil, wildlife, water, topography, etc. Man-made components have been utilized in the form of dams, fertilizer, oil well towers, underground storage reservoirs, etc.

Ecological concepts have been applied to the natural resource field in such areas as conservation, land use, wildlife management, pond management, range management, and so on. The concepts utilized in natural resource planning and in ecology have, in most instances, been synonymous. The ideas of the food chain and food web developed in ecology have been utilized by the game and wildlife management people in understanding a proper balance for hunting and fishing. The concept of succession has been used by land management people and foresters in an attempt to manipulate succession in such a way that the climax replaces itself as quickly as possible.

In this way a continued yield of resources from one area is obtained. In wildlife management it is found that many of the valuable species of game management are not climax forms, and hence, the wildlife manager may be interested in suppression of the climax through the use of fire, cutting or some other technique which will maintain the necessary level of disturbance.<sup>5</sup>

Ecology and natural resources planning and studies have evolved within the framework of the biological sciences. The interaction of ideas combined with the interchange of persons steeped in this background indicates the close relationship of these two areas.

#### Urban Planning and Ecology

Urban planning has drawn on ecological ideas mainly from the field of human ecology. Human ecology, in a broad sense, is the population ecology of a very special species — man!

Most human ecology studies have stressed the concept of the community, and within the community the aggregate of human beings in the community. This, along with other concepts of ecology, are brought out in Amos Hawley's book entitled, Human Ecology.

Man, as we have seen, not only occupies a niche in nature's web of life, he also develops among his fellows an elaborate community of relations comparable in many important respects

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<sup>5</sup> Raymond Dasmann, Environmental Conservation (New York: John Wiley & Sons, Inc., 1959), p. 22.

to the more inclusive biotic community. In at least one of its aspects the human community is an organization of organisms adjusted or in process of adjustment to a given unit of territory. Hence, the rise of human ecology has meant a logical extension of the system of thought and the techniques of investigation developed in the study of the collective life of lower organisms to the study of man. Human ecology may be defined therefore, in terms that have already been used, as the study of the form and the development of the community in human population.<sup>6</sup>

Out of this has grown the study of demography, or the use of the community as a statistical aggregate. These two studies have led to the use of ecological concepts directly related to population studies and the human community. The major failing then seems to be that there has been the lack of the use of the ecosystems approach so that there is no holistic study of the community and its environment. The only studies have been primarily of the population, thus narrowing human ecology studies and their overall usefulness.

There have been other approaches in the urban planning field. Some of these are presented below.

A Systems Approach - Stewart Marquis has used the ecosystem idea in defining the human community.<sup>7</sup>

The operational definition of human communities follows the lead of the ecologist, including not only the people, but also all the natural and man-made components and even the very space occupied by the human community. Ecologists speak of the combination of animal and plant communities and their 'habitat' as ecological systems or ecosystems. Such ecosystems include not only the living (biotic) plant and animal and insect community, but also the non living (abiotic) soil, air, water, minerals and other nonorganic materials in the area territory or space occupied by these communities.<sup>8</sup>

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<sup>6</sup>Amos H. Hawley, Human Ecology (New York: The Ronald Press Company, 1950), p. 68.

<sup>7</sup>Stewart Marquis, Development of Community Centers, 1830-1960: An Analysis of the Evolution of the Human Community Systems in the Lansing Tri-County Region (East Lansing: Institute for Community Development, Michigan State University, May 1963).

<sup>8</sup>Ibid., p. 7.

Marquis offers the following definition of the community as an ecosystem.

The human community is a complex ecosystem of human, man-made and natural components interacting through flows of materials, energy, people and information in 'man-machine-resource' subsystems and the central place and contiguous space within which the components and flows are located.<sup>9</sup>

Man's Nature and Nature's Man - In this approach Lee R. Dice utilizes the human ecosystem in identifying ranks of ecosystems that seem to be important to man.<sup>10</sup> These ecosystems are:

Tribal ecosystem - the habitat will not support large numbers.

Camp-centered ecosystem - wherever a tribe establishes its home the natural ecosystem will be altered.

Biotic provinces and tribal ecosystems - the regional community that occupies an area of relatively uniform climate is a useful unit of classification for human communities.

Homestead ecosystem - scattered homes throughout an area.

Village-centered ecosystems - a group of homes in a hamlet or village.

Town-centered ecosystems - a small village with each family nearly self-sufficient and producing some kinds of goods that other families do. A small center of human population in which specialization of labor is conspicuous.

City-centered ecosystem - a much greater specialization of labor. Offices of government, large mercantile houses, major manufacturing plants, public administration, educational facilities, etc. Villages and towns supply the city.

National ecosystem - composed of a number of tribes or city-centered and town-centered ecosystems.

This breakdown is important in understanding types of planning which may be needed for a certain level or ecosystem.

Cosmological - The cosmological approach relates fundamentally to universal problems of inherent order and meaning.

<sup>9</sup> Ibid., p. 8.

<sup>10</sup> Lee R. Dice, Man's Nature and Nature's Man: The Ecology of Human Communities (Ann Arbor: The University of Michigan Press, 1955).

The town planners' specific problem, of creating an appropriate environment for the community, is seen as analogous with the wider metaphysical problem of man's place in the ordered universe, and the organic relation of part to whole in the town is equated with the problems of organic relationships in the fabric of the cosmos.<sup>11</sup>

Thus, the cosmological idea has stressed the harmonious structure of the universe and all creation.

Two outstanding persons emphasize this unity approach. The first is Frank Lloyd Wright who stressed the cosmological approach in many of his designs. It was Wright's purpose to have the integrity of each in all and all in each. To create a oneness was Wright's purpose; but not to create a static artifact. It was Wright's feeling that changes all speak or sing in unison of cosmic law.

The other example is Walter Gropius. Gropius felt that there was a universal unity in which all opposing forces exist in a state of absolute balance. He felt the oneness approach and placed emphasis upon a cosmological philosophy of universal unity, of man in harmony with the universe and of land, nature, man and his art as one great entity. Basically, Gropius came very close to the neighborhood concept and also expressed himself in some instances about the cellular approach in organic theory. His is not a pure cosmological approach but is smattered with some ideas along the cellular line.

Nature - This concept stresses the idea that a city should be planned to allow for growth and change, but that it should look as if it has grown from the soil. The growing process is interpreted to mean unconfined natural growth and not that controlled by man.

The concept basically received impetus during the industrial revolution period. The ideas of town planning proposed to get away from the

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<sup>11</sup> Gilbert Herbert, "The Organic Analogy in Town Planning," Journal of the American Institute of Planners, Vol. XXIX, No. 3 (1963), p. 201.

industrial town and the mechanistic way of life are all examples of this "nature" approach. The central theme was "back-to-the-countryside" and this was reflected in such ideas as the garden city movement, green-belts and green wedges. It also inspired city park systems, nature reserves and national park systems. It has also led to the desire to limit the size of towns, and has promoted the concept of regionalism.

Cellular - The cellular idea realizes that the city is not a single unit but is composed of individual, identifiable parts. The outstanding aspect is the dependency upon the neighborhood and that a combination of neighborhoods, articulated by a traffic network and with the addition of specialized facilities (zones for industry, commerce) produces the city.

The most outstanding example of the cellular approach can be attributed to Eliel Saarinen. Mr. Saarinen, in his book, The City: Its Growth and Decay, offers not only the theoretical concept of the cellular approach but also how it might be applied to an actual situation. He further directs the implementation by explaining changes which must be advanced in terms of social, physical, economic and legislative elements.

Primarily, the cellular approach is fruitful in town planning thought by providing a theoretical organic framework in which the concepts of zoning, traffic segregation, efficient administration and social planning could be pursued and developed.

Urban planning has dealt with many organic concepts, one of which has placed emphasis on the human ecology. It has, therefore, not divorced itself from the organic or natural approach found to be very close to resource planning.

Systemic - the systemic approach is not the same as the systems approach, nor is it a modified version. The systems approach is primarily concerned with a holistic or ecosystem approach, encompassing all elements. The systemic approach relies upon some specific system of a plant or animal and uses this as an analogy for a particular element in town planning.

More specifically, this approach relies upon the systemic functions of animal and plant life. The approach will compare some specific organ or system in the plant or animal and then apply this to a particular element of a town plan. A good example of this is the circulatory system of a plant as compared to traffic flow in a city. The roads are considered as arteries which carry blood or traffic and, while there are different types of arteries, there also are different types of roads carrying varying kinds of traffic flows. Highway engineers have incorporated such ideas as arterial roads, trunk and branch roads; all analogies from the systemic function of plants and animals. It has had its primary focus upon the traffic aspect of town planning which may be perhaps its largest failing.

Tugwell - Rexford G. Tugwell in an article entitled, "Variation on a Theme by Cooley," uses ecology in approaching planning endeavors.

In trying to understand the relation of men to one another in society it is useful to have considered previously the relations among simpler individuals and species who share with man the experience of life. Many zoologists and botanists have lately become ecologists rather than classifiers. They are, indeed, discovering that only as they study relationships can they really understand the phenomena of plant and animal as well as human life. The related whole in which related things and individuals function has a significant life which conditions that of all its parts and members.<sup>12</sup>

Tugwell refers to a process whereby man and nature were in oneness but then man took off into the evolutionary blue and lost understanding of how life should proceed. Tugwell brings this out in the following quotation.

His (man's) reproductive apparatus, not being centralized to hive matters and calculated, almost like the broadcast pollen, to start a thousand lives that one may survive, is very little subject to the control of the world community in which its effects are made manifest. The social disciplines necessary to

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<sup>12</sup> Rexford G. Tugwell, "Variation on a Theme by Cooley," Ethics, Vol. LIX, No. 4 (July 1949), p. 234.

the regulation of numbers are not yet in being; there is still a fatal dependence on the crude and cruel checks involved in multitudinous deaths before maturity; and man's inherent social loyalties tend always to limit these. Something more is urgently needed.<sup>13</sup>

Tugwell realizes a close relationship, what seems to be an almost inseparable relationship, between population and community. He stresses that the community and its environment must be understood completely if man is to foresee, control and agree.

A unitary process must be obtained by all elements of the environment and the culture and simultaneously. If there are any which escape; which are not brought into an understood relationship with the central process they will tend to gain advantages without accepting the limitations of common living. This can be observed with the industrial revolution in America since 1850.<sup>14</sup>

Tugwell visualizes the development plan as a tool for guiding and controlling the community and its environment. But he also feels that the plan must be based on the unitary process.

### Summary

The investigation conducted thus far has suggested that the relationship of ecology to resource and urban planning has been significant. Some of the outstanding features are:

1. Ecology, by its very biological origin, has emphasized natural resources.
2. Ecological concepts have been applied in natural resources planning and research.
3. The ecosystems approach has been utilized in some urban planning efforts.
4. The human ecologists have mistakenly called upon ecological concepts for help in understanding the behavior of human beings. The human

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<sup>13</sup>Ibid., p. 243.

<sup>14</sup>Ibid.

ecologist failed to understand that almost all of natural ecology had focused on trying to deal with the relations between organisms and abiotic substances of their environment. By not understanding this, the human ecologist distorted concepts by trying to fit them to man and man-made artifacts and patterns of human settlement. The human ecologist also failed by not being holistic and including natural organisms and substances other than man and the flows of energy and material.

It is now necessary to investigate the integration of concepts to justify ecology as the unifying framework. To aid in substantiating this idea in more depth the concepts of the two fields of planning are analyzed in relationship to selected ecological concepts.



## CHAPTER IV

### ECOLOGY AS AN INTEGRATING FRAMEWORK

Before ecological concepts could be investigated in regard to resource, urban and resource-urban planning there had to be a selection of concepts to be investigated. This selection was based upon the following criteria:

1. Offer as many differing ideas as possible.
2. Choose some concepts of ecology which would not match up with concepts in the other two fields. It was hoped that this would offer impetus for new ideas regarding the use of ecology or the expansion of ecology.
3. The opposite to the criteria above was to choose some concepts which would fit both fields of planning and show the relationship between the two planning efforts and ecology.
4. Choose concepts which could easily be comprehended by someone not well acquainted with the ecological field.

Using these criteria the concepts on Plate 6 were chosen for investigation.

With the selection of these concepts it was then necessary to define each. The levels of organization remain in the same capacity as was defined earlier in Chapter III.

Carrying Capacity - The upper level beyond which no major increase can occur—the saturation level.

Ecological Density - Population size in relation to some unit of space or observation time.

Home Range - Many kinds of animals are known to confine their roamings within certain boundaries which are known as home ranges.

Ecotone - The transition zone between communities presents a situation of special ecological interest.

Dominance - Presence of one or a few species appear to exert a major effect in determining other species in the area.

Niche - The position or status of an organism within its community and ecosystem resulting from the organism's structural adaptation, physiological response and specific behavior.

Intraspecies	Community	Ecosystem
* 1. <u>Optimal yield</u>	* 1. <u>Competition</u>	* 1. <u>Niche</u>
* 2. <u>Carrying capacity</u>	2. Predation	2. Biogeochemical cycle
* 3. <u>Ecological density</u>	3. Antagonism	3. Shelford's law of tolerance
4. Allee's principle	* 4. <u>Mutualism</u>	4. Liebig's law of the minimum
5. Law of the minimum	5. Biome	
* 6. <u>Principle of minimum population</u>	6. Biotic community	* 5. <u>Limiting factors</u>
7. Population dispersal	7. Pioneer community	* 6. <u>Pyramid of numbers</u>
8. Mortality	* 8. <u>Ecotone</u>	* 7. <u>The food chain</u>
9. Natality	* 9. <u>Edge effect</u>	8. The food web
*10. <u>Home Range</u>	10. Climax	9. Principle of partial equivalence
	11. Succession	10. Habitat
	12. Community stratification	
	*13. <u>Dominance</u>	
	14. Community periodicity	
	15. Biotype	

\*These concepts were selected for the detailed investigation that follows.

Source: Refer to bibliography for books concerned with ecology.

Plate 6. Key Ecological Concepts

Pyramid of Numbers - Many small units are required to equal the mass of the big unit, regardless of whether the units are organisms or building blocks.

Optimal Yield - In the simplest situation with no modifying conditions the population should be maintained at the inflection point of its growth curve, since at that point the largest increment would represent the largest harvest possible without inroads upon the breeding stock.

Principle of Minimum Population - In order for a population to survive indefinitely in an environment its number must be maintained above a critical minimum.

Mutualism - Association in which both species derive benefit.

Principle of Edges - As a rule the ecotone contains more species and often a denser population than either of the neighboring communities.

Competition - The interrelation of two organisms striving for the same thing.

Limiting Factor - The combination of food stuff available and the range in between (the elements of the environment) which is the tolerance limits.

Food Chain - The transfer of food energy from the source in plants through a series of organisms with repeated eating and being eaten.

### Analysis of Concepts

With the definitions of these ecological concepts it is possible to develop an approach to analyzing the concepts of ecology and the three fields of resource, urban and resource-urban planning. In this instance, two approaches were utilized. The first is entitled the "present" approach. This approach compares the concepts of ecology with those concepts from the three planning fields which closely relate to the ecological concept. For example, the ecological concept of carrying capacity corresponds with the resource concept of carrying capacity, the resource-urban concept of carrying capacity and the urban planning concept of holding capacity. In this instance, the carrying capacity was basically the saturation level, which is also true of the effective net holding capacity for a human population in a given area.

Another example is that of mutualism which corresponds in resource and resource-urban field but is represented by the concept of mixed use in the urban planning field. In some instances, concepts in the urban planning field and resource-urban field could not be found to correspond with the ecological field. A good example of this is the concept of the niche.

Along with the concept investigation are columns for each field indicating the applications of the concept. This was done to aid in further understanding the concept and to stress the joint application of the concepts in the resource-urban or joint area. The results of the investigation are portrayed on Plate 7.

The second approach, entitled the "possible approach" is shown on Plate 8. This approach is an attempt to analyze the potential of ecology in regard to resource, urban and resource-urban planning. This was illustrated by possible applications of the concept to the fields. An example of this approach is the concept of ecological density. The concept was applied in all fields. For resource planning it was concerned with such things as density for range management, wildlife, agriculture, etc. For urban planning the possibility seemed to be present for determining density standards, standards for street tree planning, etc. The resource-urban effort is a culmination of the two areas already discussed. This approach attempts to fill the gaps found in the present approach. A good example of this is the limiting factor concept of ecology.

### The Integrative Model

With the establishment of ecology as a unifying framework and the investigation of ecological concepts as unifying tools, it now becomes possible to indicate how this conceptual framework can be effectively drawn upon. To do this an integrative model was developed as shown on Plate 9.

The model begins with the last phase of the diagram on Plate 4, Chapter II, which stressed the use of some framework which would be the same for resource and urban planning. Leading directly from this phase of the diagram is the line to ecology, the unifying field. Once the unifying field was justified it was possible then to indicate how the conceptual framework could be applied to the fields and the components of these fields which were under investigation.

PRESENT APPROACH						
ECOLOGY	RESOURCE PLANNING		RESOURCE PLANNING - URBAN PLANNING		URBAN PLANNING	
CONCEPTS	CONCEPT	APPLICATION	CONCEPTS	APPLICATION	CONCEPTS	APPLICATION
INTRASPECIES						
CARRYING CAPACITY - The upper level beyond which no major increase can occur - the saturation level.	Carrying Capacity Refer to Ecol.	1. Range mgt. 2. Forestry	Carrying Capacity The number of resources & urban elements which can inhabit an area without disrupting it.	1. Range mgt. 2. Forestry 3. Density stds. 4. Zoning	Holding Capacity Effective net holding capacity of an area.	1. Density stds. 2. Zoning
OPTIMAL YIELD - in the simplest situation with no modifying conditions the population should be maintained at the inflection point of its growth curve, since at that point the largest increment would represent the largest harvest possible without inroads upon the breeding stock.	Optimum Use - The most favorable condition to receive the highest return without deteriorating or interrupting the environment.	1. Forestry 2. Wildlife 3. Watershed management	Optimal Yield Attempt to get the highest yield or best living environment by utilizing urban & resource of foods in the best way possible.	1. Forestry 2. Wildlife 3. Watershed mgt. 4. Land use planning 5. Zoning	Highest Use - The highest and best use of the land.	1. Land use planning 2. Zoning
ECOLOGICAL DENSITY - pop. size in relation to some unit of space or observation time.	Intensity of Use The number & amount of an object located on some pre-determined space.	1. Range mgt. 2. Wildlife	Ecological Density Attempting to find the proper density of both resource & urban elements	1. Range mgt. 2. Wildlife 3. Density stds. 4. Land use planning	Density - The quantity of anything per unit of vol. or area and # of persons per area.	1. Density stds. 2. Land use planning
PRINCIPLE OF MINIMUM POPULATION - in order for a population to survive indefinitely in an environment its number must be maintained above a critical minimum.	Sustained yield Harvest & growth must be balanced over a period of time so that yield will be continued into perpetuity	1. Wildlife mgt. 2. Pond mgt.				
HOME RANGE - Many kinds of animals are known to establish a center of operations for themselves and to confine their roamings within certain boundaries.	Home Range Refer to Ecol.	1. Wildlife	Home Range Breakdown of an area into sub-units for close study of both urban & resource elements.	1. Wildlife 2. Park & school plan 3. Shop center devel.	Neighborhood - A residential neighborhood that meets the needs of family life.	1. Park & school planning 2. Shop center devel.
COMMUNITY						
MUTUALISM - Association in which both species derive benefit.	Multiple use - The principle that a variety of purpose should be provided in an area.	1. Forestry 2. Watershed management	Mutualism - Allowing both resource & urban elements to occupy the same area in coordination & harmony	1. Forestry 2. Watershed mgt. 3. Heterogeneous living 4. Park - School planning	Mixed Use - An area of mixed land uses	1. Heterogeneous living 2. Park - School planning
ECOTONE - The transition zone between communities presents a situation of special ecological interest.	Ecotone Refer to Ecol.	1. Wildlife mgt. 2. Range mgt. 3. Land Use	Ecotone - The area between res. & urban elements create rural & urban or vice versa.	1. Green belt 2. Regional park 3. Large lot zoning	Zone of Transition An applied zone between two dissimilar land may also be a blight zone.	1. Zoning 2. Gray areas 3. Highway planning 4. Pond planning
PRINCIPLE OF EDGES - As a rule the ecotone contains more species and often a denser population than either of the neighboring communities.	Principle of Edges Refer to Ecol.	1. Wildlife mgt. 2. Land Use				
DOMINANCE - Presence of one or a few species appear to exert a major effect in determining other species in the area.	Dominance Refer to Ecol.	1. Forestry 2. Ag. 3. Land Use	Dominance - This may be a consideration in creating or curtailing development. If soil is poor, exhibit poor drainage & is a dominant factor, this will curtail housing devel.	1. Land Use Planning 2. Ag. 3. Zoning	Dominance Refer to Ecol.	1. Land Use Planning 2. Zoning
COMPETITION - The inter-relation of two organisms striving for the same thing.	Competition Refer to Ecol.	1. Wildlife 2. Pond mgt. 3. Forestry				
ECOSYSTEM						
NICHE - The position or status of an organism within its community and ecosystem resulting from the organisms structural adaptation, physiological response and specific behavior.	Niche Refer to Ecol.	1. Wildlife 2. Forestry				
LIMITING FACTOR - The combination of food stuff available and the range in between; which is the tolerance limits.	Limiting Factor Refer to Ecol.	1. Wildlife 2. Forestry 3. Watershed mgt.	Limiting Factor Some areas may have to be limited to rural use due to its ideal consideration for farming. Others for housing because of ideal consideration.	1. Ag. 2. Land use planning 3. Zoning 4. Subd. Regs.	Malthus Theory There is only so much food stuff, etc. to support so many people	1. Land Use Planning 2. Density stds. 3. Zoning
PYRAMID OF NUMBERS - Many small units are required to equal the mass of the big unit, regardless of whether the units are organisms or building blocks.	Pyramid of #s Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt.				
FOOD CHAIN - The transfer of food energy from the source in plants through a series of organisms with repeated eating and being eaten.	Food Chain Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt. 3. Land Use 4. Ag.				

LEVELS OF ORGANIZATION



LEVELS OF ORGANIZATION	POSSIBLE APPROACH						
	ECOLOGY	NATURAL RESOURCES PLANNING		NATURAL RESOURCES - URBAN PLANNING		URBAN PLANNING	
	CONCEPTS	CONCEPTS	APPLICATION & POSSIBILITY	CONCEPTS	APPLICATION & POSSIBILITY	CONCEPTS	APPLICATION & POSSIBILITY
	INTRASPECIES						
	CARRYING CAPACITY - The upper level beyond which no major increase can occur - the saturation level.	Carrying Capacity Refer to Ecology	1. Range Mgt. 2. Forestry 3. Agriculture	Carrying Capacity Refer to Ecol.	1. Woodlot 2. Garden farming 3. Small open space programs with pond mgt., 1 gar. 4. Could be used in density determination	Carrying Capacity Refer to Ecol.	1. Could be like number of people that can live in an area.
	OPTIMAL YIELD - In the simplest situation with no modifying conditions the population should be maintained at the inflection point of its growth curve, since at that point the largest increment would represent the largest harvest possible without inroads upon the breeding stock.	Optimal Yield Refer to Ecol.	1. Forestry 2. Wildlife 3. Watershed mgt. 4. Ag. 5. Pond mgt.	Optimal Yield Refer to Ecol.	1. Woodlot mgt. 2. Garden farming 3. Small game and pond mgt. nec. areas. 4. Could be used in density determination	Optimal Yield Refer to Ecol.	1. Could be used in determining number of people to inhabit an area.
	ECOLOGICAL DENSITY - pop. size in relation to some unit of space or observation time.	Ecological Density Refer to Ecol.	1. Range mgt. 2. Forestry 3. Wildlife mgt.	Ecol. Density Refer to Ecol.	1. Woodlot mgt. 2. Garden farming 3. Small open space programs with pond mgt., game preserve, etc.	Ecol. Density Refer to Ecol.	1. St. tree planting 2. Arboretum devel. 3. Cultured gardens 4. Density Std.
	PRINCIPLE OF MINIMUM POPULATION - In order for a population to survive indefinitely in an environment its number must be maintained above a critical minimum.	Principle of Minimum Pop. Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt. 3. Forestry	Principle of Minimum pop. Refer to Ecol.	1. Small open space program with pond mgt., wildlife, etc. 2. Septic tank regulation (BOD) 3. Density Stds.	Principle of Minimum Pop. Refer to Ecol.	1. Vegetation in the development of subdivisions 2. Sanitation (BOD) Bio-chemical Oxygen Demand 3. Density Std.
	HOME RANGE - Many kinds of animals are known to establish a center of operations for themselves and to confine their roamings within certain boundaries.	Home Range Refer to Ecol.	1. Wildlife mgt.	Home Range Refer to Ecol.	1. Small game preserves, etc. 2. Public Health Stds., housing stds. 3. Determine study areas for both man & natural resource elements	Home Range Refer to Ecol.	1. Public Health - nats, live etc. in homes. 2. Could be used in determining study area for intraspecific studies or for sub. fac. needs
	COMMUNITY						
MUTUALISM - Association in which both species derive benefit.	Mutualism Refer to Ecol.	1. Wildlife mgt. 2. Ag. (Sheep & cows)	Mutualism Refer to Ecol.	1. Small preserve mgt. open space program 2. Harmonious relationship of man & nature	Mutualism Refer to Ecol.	1. Leaving of trees in subd. allows shade for man - tree continues to exist 2. Soil cons. practices to reduce soil run-off in new subd. devel.	
ECOTONE - The transition zone between communities presents a situation of special ecological interest.	Ecotone Refer to Ecol.	1. Wildlife mgt. 2. Forestry 3. Ag. 4. Land Use	Ecotone Refer to Ecol.	1. Ag. 2. Small preserves	Ecotone Refer to Ecol.	1. Could be the interaction area between community influence	
PRINCIPLE OF EDGES - As a rule the ecotone contains more species and often a denser population than either of the neighboring communities.	Principle of Edges Refer to Ecol.	1. Wildlife mgt. 2. Forestry 3. Land Use	Principle of Edges Refer to Ecol.	1. The activities of man & natural resources in the ecotone area.	Principle of Edges Refer to Ecol.	1. The activities of man in the ecotone area.	
DOMINANCE - Presence of one or a few species appear to exert a major effect in determining other species in the area.	Dominance Refer to Ecol.	1. Forestry 2. Ag. 3. Land Use	Dominance Refer to Ecol.	1. Ag. 2. Small woodlots 3. Could be used to determine dominance of one element over the other for space allocation or land use.	Dominance Refer to Ecol.	1. Pub. Health - appearance of man & insecticide may influence the other species in the area (man as dominant) 2. Could be used - dominance of certain resource elements could dictate devel. of a park.	
COMPETITION - The interrelation of two organisms striving for the same thing.	Competition Refer to Ecol.	1. Wildlife 2. Ag. 3. Forestry	Competition Refer to Ecol.	1. Man competing against forest or wildlife, etc.	Competition Refer to Ecol.	1. Man competing with forest or against wildlife, etc. in devel. (subd.)	
ECOSYSTEM							
NICHE - The position or status of an organism within its community and ecosystem resulting from the organisms structural adaptation, physiological response and specific behavior.	Niche Refer to Ecol.	1. Forest 2. Ag.	Niche Refer to Ecol.	1. The role of man & nature in the ecosystem	Niche Refer to Ecol.	1. Man's role in nature 2. Man's break down into professions - the work role of each person.	
LIMITING FACTOR - The combination of food stuff available and the range in between which is the tolerance limits.	Limiting Factor Refer to Ecol.	1. Wildlife 2. Forestry 3. Watershed mgt.	Limiting Factor Refer to Ecol.	Growth of both man & natural resources	Limiting Factor Refer to Ecol.	The limiting growth of man in the ecosystem - The Malthus concept.	
PYRAMID OF NUMBERS - Many small units are required to equal the mass of the big unit, regardless of whether the units are organisms or building blocks.	Pyramid of Numbers Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt.	Pyramid of Numbers Refer to Ecol.	1. Developing govt. units compatible to both resources & urban planning.	Pyramid of Numbers Refer to Ecol.	Govt. - Could reflect governmental devel.	
FOOD CHAIN - The transfer of food energy from the source in plants through a series of organisms with repeated eating and being eaten.	Food Chain Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt.	Food Chain Refer to Ecol.	1. Land use 2. Small farm mgt. 3. Balancing food chain between man & nature	Food Chain Refer to Ecol.	Man's role in the food chain.	

LEVELS OF ORGANIZATION	ECOLOGY	NATURAL RESOURCES PLANNING	
	CONCEPTS	CONCEPTS	APPLICATION & POSSIBLE
LEVELS OF ORGANIZATION	INTRASPECIES		
	CARRYING CAPACITY - The upper level beyond which no major increase can occur - the saturation level.	Carrying Capacity Refer to Ecology	1. Range Mgt. 2. Forestry 3. Agriculture
	OPTIMAL YIELD - In the simplest situation with no modifying conditions the population should be maintained at the inflection point of its growth curve, since at that point the largest increment would represent the largest harvest possible without inroads upon the breeding stock.	Optimal Yield Refer to Ecol.	1. Forestry 2. Wildlife 3. Watershed mgt. 4. Ag. 5. Pond mgt.
	ECOLOGICAL DENSITY - pop. size in relation to some unit of space or observation time.	Ecological Density Refer to Ecol.	1. Range mgt. 2. Forestry 3. Wildlife mgt.
	PRINCIPLE OF MINIMUM POPULATION - In order for a population to survive indefinitely in an environment its number must be maintained above a critical minimum.	Principle of Minimum Pop. Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt. 3. Forestry
	HOME RANGE - Many kinds of animals are known to establish a center of operations for themselves and to confine their roamings within certain boundaries.	Home Range Refer to Ecol.	1. Wildlife mgt.
	COMMUNITY		
	MUTUALISM - Association in which both species derive benefit.	Mutualism Refer to Ecol.	1. Wildlife mgt. 2. Ag. (Sheep & cows)
	ECOTONE - The transition zone between communities presents a situation of special ecological interest.	Ecotone Refer to Ecol.	1. Wildlife mgt. 2. Forestry 3. Ag. 4. Land Use
	PRINCIPLE OF EDGES - As a rule the ecotone contains more species and often a denser population than either of the neighboring communities.	Principle of Edges Refer to Ecol.	1. Wildlife mgt. 2. Forestry 3. Land Use
LEVELS OF ORGANIZATION	DOMINANCE - Presence of one or a few species appear to exert a major effect in determining other species in the area.	Dominance Refer to Ecol.	1. Forestry 2. Ag. 3. Land Use
	COMPETITION - The interaction of two organisms striving for the same thing.	Competition Refer to Ecol.	1. Wildlife 2. Ag. 3. Forestry
	ECOSYSTEM		
	NICHE - The position or status of an organism within its community and ecosystem resulting from the organisms structural adaptation, physiological response and specific behavior.	Niche Refer to Ecol.	1. Forest 2. Ag.
	LIMITING FACTOR - The combination of food stuff available and the range in between which is the tolerance limits.	Limiting Factor Refer to Ecol.	1. Wildlife 2. Forestry 3. Watershed mgt.
	PYRAMID OF NUMBERS - Many small units are required to equal the mass of the big unit, regardless of whether the units are organisms or building blocks.	Pyramid of Numbers Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt.
	FOOD CHAIN - The transfer of food energy from the source in plants through a series of organisms with repeated eating and being eaten.	Food Chain Refer to Ecol.	1. Wildlife mgt. 2. Pond mgt.

Same Model  
Separate Planning  
Separate Action

gether efforts in education and organization and gradually bring operational planning together, leading to joint action.

Plate 9. The Integration Model

TIME - Future (Dynamics)

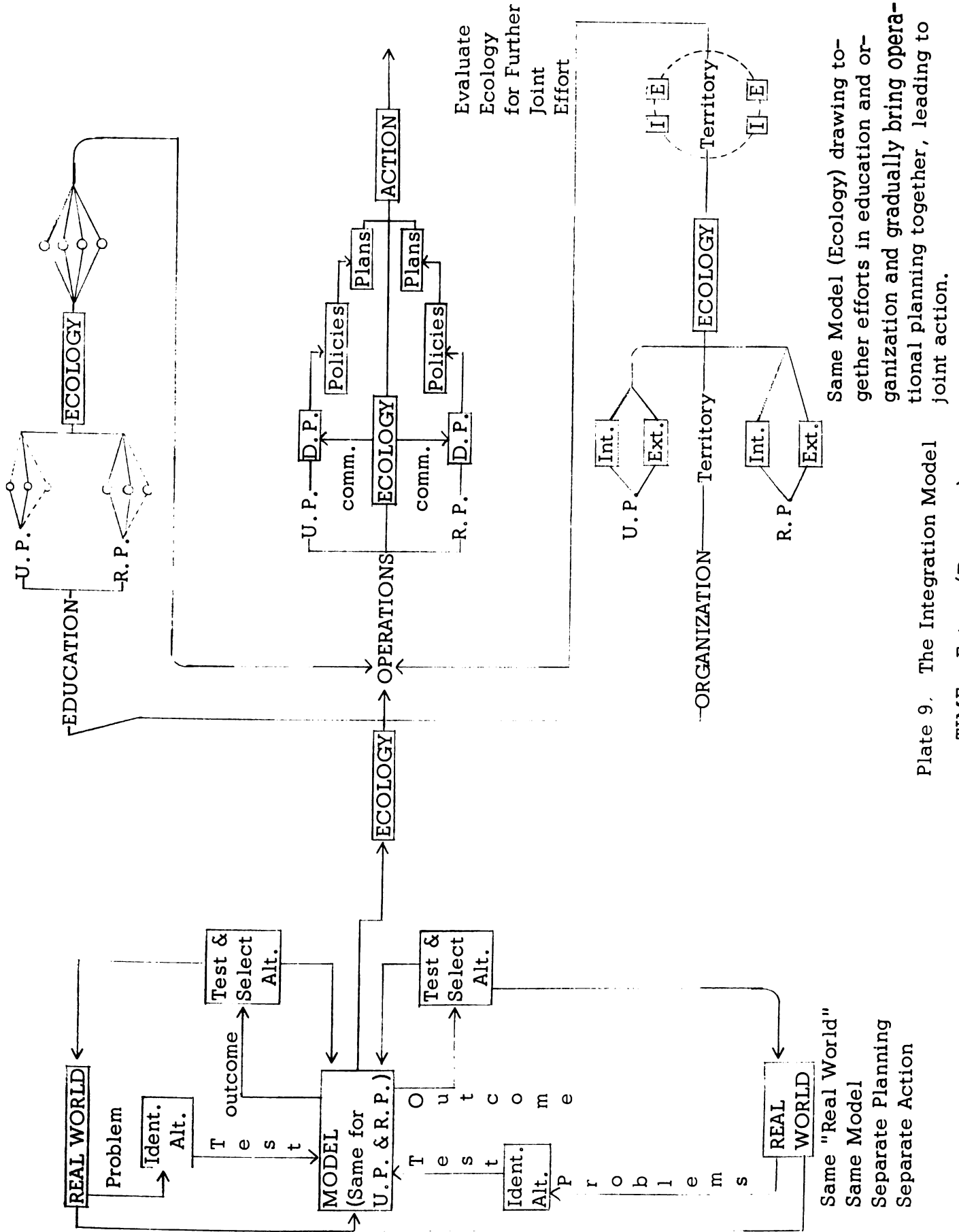


Plate 9. The Integration Model



The first step in integration was to unify the educational subsystem of both fields. The educational split between the two fields was discussed in Chapter II. The diagram then shows the two fields calling upon ecology as the base for education and from this, calling equally upon the components of the educational subsystem. With ecology as the base, the student will be introduced to the factor which stresses the holistic ideas of both resource and urban planning. With the educational subsystem unified, it is then possible to educate professionals who can go into the field and work toward more integrated operations.

The organization of the two fields is shown with resource planning organization and urban planning organization. Territory is shown between the two fields. The diagram indicates that ecological concepts were investigated in regard to organization, but that little could be found to aid in integrating the two fields of resource and urban planning organization. (This is shown by the dashed lines.) For territory there are some possibilities, such as the biome, the community and home range, which may be useful. Future investigation will be needed, but possibilities are becoming evident in terms of human ecosystems. (From Dice: Man's Nature and Nature's Man. See discussion in Chapter III.)

The unification of organization, if developed, would aid the operations subsystem, thus the line from organization leads to operations.

Operations for resource and urban planning are shown as mutually separated. With the integration of concepts of the two fields based on ecology, it is now possible for the two fields to communicate. Instead of two different languages the two fields now have one-ecology. Once communication is developed, there will be a tendency to develop decisions which are similar, policies which are similar, plans which are similar and more coordinated, and finally joint action between the two fields. The diagram shows the stages of the operations coming closer together until they finally culminate in action. From the action stage, the arrow continues on in an effort to evaluate ecology for further joint efforts.

### Potentials of Ecology as Integrative Framework

In viewing potentials of ecology as an integrative framework the same criteria utilized earlier in the thesis will be used. This framework constituted the three basic subsystems of education, operations and organization. A fourth category was brought into the framework in the form of territory.

The above framework suggests that some differentiation should be made at this point. That differentiation is concerned with the substantive matters of resource and urban planning (the elements each is concerned with — transportation, water, forest, land use, etc.) and the planning for planning. Basically the thesis has been concerned with the latter area or the planning for planning phase. Therefore, the potentials and later the problems can be discussed in detail in regard to the planning for planning area and some general conclusions can be ascertained regarding the elements of both fields.

Potentials for Planning for Planning - The planning for planning potentials can be discussed as follows:

#### Education

Ecology could be the basis for education of planners in both fields since it encompasses elements concerning both fields.

#### Operation

1. Ecological concepts, coordinating the fields of planning under investigation could be a communicating device between the fields.
2. Ecology itself calls upon many other fields for its concepts, thus making it a more fruitful base for operations.
3. Ecology has had a very close relationship to resource planning.
4. The resource-urban planning efforts are, for the most part, reflections of both areas with potential development in the ecological vein. The resource-urban area deserves close consideration of ecological concepts.

#### Organization

The ecosystems approach offers much potential for looking at problems comprehensively.

### Territory

Ecological concepts of territory have some potential which needs more investigation.

Potentials for Substantive Planning - The substantive planning can be discussed as follows in regard to potential:

### Education

Education based on the holistic approach or ecology will give results of higher quality in the substantive area.

### Operation

1. A better operation resulting from the use of ecology will result in better planning dealing with substantive matters.
2. Application of ecological concepts to the substantive matters with which resource planners work is relatively easy. They deal with the same matters which natural ecologists study animals, plants, interrelations between organisms and the non-living substance in their habitats, interrelations between populations, communities and ecosystems.

### Organization

As ecology is expanded or new concepts are added these concepts may be applied to organization, thus allowing better, more comprehensive organization development.

### Territory

Delineation of planning territories using ecology will allow more comprehensive development of the substantive matter.

Problems for Planning for Planning - The planning for planning problems can be discussed as follows:

### Education

Education of people in ecology might be relatively difficult. The subject matter with which ecology deals requires thorough study and understanding. Guidance concerning fundamental concepts is a definite pre-requisite. Guidance for urban planners will be necessary to permit understanding of the ecological role in urban planning.

### Operation

There might be a problem of communication with ecologist unless the concepts are kept close to their ecological definitions.

### Organization

The available ecological concepts cannot be used directly in extending our understanding to human behavior. The main reason is that ecologists have not dealt with individual and group behavior of complex animals like human beings in such detail.

### Territory

The resource and urban area has no definite organization to bring about application of the concepts.

Problems for Substantive Planning - The substantive planning problems can be discussed as follows:

### Education

The ecological approach may not allow as much specialization as an individual may desire to meet specific research desires.

### Operation

1. Man is a natural organism, hence the field of natural ecology, which intends to deal with all kinds of natural organisms, should have general concepts pertinent to man and his behavior. Ecology has not developed many specific concepts for the human species, so it will not be easy to test or demonstrate how the more general ideas apply to human beings, in their relations with other human beings, with other species, or with the non-living parts or their habitat.

2. Application of ecological concepts to matters with which urban planners deal is harder, since ecologists have not dealt much with human beings, man-made artifacts or man's modification of natural organisms and natural non-living substances. The subject matter of urban planners is the city, the urban area and the urban region, with traditional concentration on the artifacts and growing interest in human organisms. Even for this more traditional urban planning approach, there are a few clues in ecological studies of the nest-building patterns of birds and fish, in the territories or home ranges of various species, in the behavior of ants and termites, etc.

3. Applications of ecological concepts to the planning process itself - to the form of human behavior which we call formal planning - is the hardest of all. Ecologists have not dealt with intraspecies or population behavior anywhere near as complex as the behavior of human beings, much less the highly-organized, rational and deliberate form of behavior implied in resource and urban planning. Ecologists may have come closest in studying ants and termites. Psychologists, physiologists

and biologists have contributed to the understanding of the various forms of individual and group behavior of animals, especially the complex behavior of human animals.

#### Organization

The lack of organizational concepts may curtail the effectiveness of the substantive matters.

#### Territory

Obtaining people to understand all elements of a territory may present many problems.

Overall, ecology offers a very fruitful field of integrative purposes. It now remains to examine needed research and additional ideas and then to develop the last chapter which will be concerned with conclusions and recommendations.

#### Needed Research

It is apparent that more research is needed in organization and territory. It is possible that, instead of waiting for ecology to expand its knowledge and include additional ideas on organization, urban and resource planning can push forward the development of territorial concepts for human organization derived from the basic ecological concepts. The major point is that organization concepts should be developed as soon as possible.

#### Additional Ideas

There are additional uses for ecology other than these discussed in this thesis. For example, it may be possible to identify concepts which will aid in developing design standards for planning efforts in the two fields.

Other ideas may be found which will prove fruitful to integrative efforts. This thesis has taken an initial step in directing future studies. To encourage these future studies and to save valuable research time by others, the last chapter will be concerned with the conclusions, which will portray this author's efforts, and recommendations for extended study and understanding.

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

The additional research suggested in the last chapter cannot hopefully be carried to any completion without other persons understanding the research effort pursued in this thesis. Neither can it be expected that a person looking at this thesis would want to pursue research along the additional ideas mentioned in the last chapter unless some of these ideas were firmly pinioned to urban planning. Therefore, this chapter of the thesis will be concerned with outlining approaches to the thesis which did not work, developing some general recommendations and then applying what ecology means to urban planning and resource planning.

#### Approaches That Did Not Work

Several approaches were utilized and discussed in developing other drafts of this thesis before this approach was decided upon. The approaches were fruitful in terms of leading the writer along new learning paths, but each had its fault. It was felt that the most profitable conclusions would be to portray the approaches used and their shortcomings. This should be helpful to others interested in this subject and help them avoid making the same mistakes.

The three approaches tested can be categorized as the "direct" approach, the "indirect" approach and the "utilized" approach. The "direct" approach analyzed the concepts of resource and urban planning and their integration in ecology. Once this was accomplished, the ecological concepts were applied to organizational problems and interpreted as organizational principles. An example of this was the concept of mutualism which was used as an organizational principle to apply to bringing the two fields under investigation together. Discussion of this approach led the author to abandoning it because the organizational levels were not adhered to.

For example, concepts relevant to only one species (population) were applied to an interspecies study (community) and its relationship to its environment.

The "indirect" approach developed the conceptual framework as was done in the "direct" approach. From this point an integrative model was developed which included organization as one of the components of the model. From this point organization principles were developed and applied to problems. Once this was done some of the ecological concepts were tested. For example, the ecotone was tried as a concept for developing a joint committee organization between resource areas and political areas. This approach was abandoned because of the lack of ecological concepts dealing with human organization.

The "utilized" approach is the one used in Chapters III and IV of the thesis. This approach led to first looking at the possibility of ecology as integrating concepts and finally applying an integrating model. It was felt that this is the most practical and holds benefit for development of integrated efforts.

#### Meaning for Both Fields

For both fields the thesis has meanings that can be developed as follows:

1. The historical sketch will permit some understanding of how each field evolved.
2. The present situation will allow an understanding of the existing problems for both fields.
3. The ecological aspect will allow each field to internally look at itself and hopefully solve its internal problems.
4. Each field can visualize its relationship to ecology and how this relationship can be improved or expanded.

#### Meaningful Ideas for Urban Planning

The framework utilized in Chapter IV where planning was developed

into planning for planning and planning for substantive elements will be utilized here.

Planning for Planning - Several ideas concerning ecology present themselves to the urban planner.

1. In terms of territory, ecology offers some ideas for developing a hierarchy of planning areas. This will aid in coordinating planning efforts.
2. Delineation of planning areas for planning purposes can be analyzed through the study of flows.
3. Ecology offers a framework for educating urban planners to become aware of the natural environment which surrounds them and how this environment affects planning.
4. Ecology offers the urban planner a communication device within which to develop an understanding of the natural environment.
5. Ecology will aid in allowing urban planners to become more aware of techniques used in the natural environment which could be utilized in the urban area. (Soil analysis for subdivision development, park development, etc.)
6. Problems of the urban planner can be viewed in a more comprehensive vein when utilizing the ecosystems concept.

Substantive Planning - There are many ways in which ecology may be utilized by the urban planner in working with the planning process.

1. Ecology and the ecosystems approach offers a comprehensive framework in which the urban planner can develop the most comprehensive reconnaissance survey. (Problems regarding a regional approach to the city, or the regional idea -- the inputs from other regions or problems from other regions.)
2. Ecology and the ecosystem concept offers a comprehensive framework upon which objectives for urban studies can be based.
3. Planning areas may be more easily interpreted and developed by understanding flows between the cultural and natural environment.



4. There are many concepts which may be applied to some of the elements of urban planning. For example, the concept of the niche might be used in economic base analysis in determining man's breakdown into professions. The use of the limiting factor concept could be used in population analysis of an area. The Pyramid of Numbers concept might be used to reflect some governmental development in the area. The use of the ecosystems concept and analyzing flows could be used in developing a circulatory system. Physical design could use the concept of mutualism in designing subdivisions by leaving trees in subdivisions, etc.
5. Ecological concepts could offer some ideas on standards and principles to be used. For example, the concept of carrying capacity could be used in determining density standards and the concept of ecological density could also be used for this purpose. Standards could also be developed for public health by using the home range concept.
6. Ecology itself could serve as the base for developing concepts to be used in urban planning. These concepts and their use have been discussed in the examples above.
7. Ecological concepts offer some ideas concerning new control efforts regarding population -- such concepts as optimal yield and limiting factor. [One example -- Indirectly some of the ecological concepts suggest some new programs which might be developed. In this case, these programs would encourage urban and resource cooperative development.] (Concept of the Ecotone.)

#### Meaningful Ideas for Resource Planning

The framework utilized for the presenting of meaningful ideas for the urban planner will be used for presenting meaningful ideas for the resource planner.

Planning for Planning - Several ideas concerning ecology present themselves to the resource planner.

1. Ecology offers some ideas for developing a hierarchy of planning areas. This will aid in coordinating planning efforts.
2. Delineation of planning areas for planning purposes can be analyzed through the study of flows.
3. Ecology and the ecosystems concept offers a framework for educating resource planners to become aware of the cultural environment.
4. Ecology offers the resource planner a communication device within which to develop an understanding of the cultural environment.
5. Ecology will aid in allowing resource planners to become more aware of techniques used in the cultural environment which would be used in the natural area. (Organization concepts, for example.)
6. Problems of the resource planner can be viewed in a more comprehensive vein when utilizing the ecosystems concept.

Substantive Planning - There are many ways in which ecology may be utilized by the resource planner in working with the planning process.

1. Ecology and the ecosystems concept offers a comprehensive framework upon which objectives for resource studies can be based.
2. Planning areas may be more easily interpreted and developed by understanding flows between the cultural and natural environment.
3. There are many concepts which are already being applied to some of the elements of resource planning. The close tie between ecology and resource planning, discussed in Chapter III, is a reflection of this. The approach of this thesis also attempts to reflect the use of urban planning concepts which may or are being used in the resource field (land use controls, etc.).
4. Ecological concepts offer some idea concerning new control efforts regarding population. Such concepts as optimal yield and limiting factor are examples. Indirectly, some of the ecological concepts suggest some new programs which might be developed. In this

case, these programs would encourage urban and resource co-operative development. (Concept of the Ecotone.)

### Meaning for Integration

To offer additional impetus for study, the following recommendations are developed:

1. The historical evolution of resource and urban planning should be understood by those interested in the integration of the two fields. This will offer the basis for an understanding of some of the problems and misunderstandings which have occurred between the two planning fields.
2. It is recommended that ecology be given serious consideration as the conceptual framework for both fields. It is important to recognize this framework as a starting point for integrating the two fields.
3. The present situation of resource, urban and resource-urban planning efforts should be understood. This will aid in not only understanding the problems but in developing a framework for approaching those problems.
4. There should be an understanding of the history of ecology. This will aid in understanding the origin of concepts, the field and its potentials.
5. It is recommended that planners in both fields be cognizant of the relationship between resource planning and ecology and urban planning and ecology. This will aid in justifying ideas relevant to ecology, but it will also help in understanding past mistakes made in using ecology as contrasted with the meaningful ideas which are using ecology in a fruitful pursuit.
6. The conceptual framework is only the base. There must be a conscious effort made to utilize this base in other forms. (For example, in designing for both fields.)

7. The integrative model should be given serious consideration in using the conceptual framework. The components of the model should be understood in detail.
8. Education should play an increasing role in integrating resource and urban planning. Within the educational framework there should be emphasis upon the field of ecology and a well-rounded education in the natural sciences, biological sciences, social sciences and humanities.
9. Concepts relevant to organization should be investigated more intensively. Possibilities for organizational concepts from the other fields to be applied to ecology should be explored.<sup>1</sup>
10. More investigation of ecological concepts relevant to territory and a hierarchy of territory should be made. This will aid in structuring the use of ecological concepts at desired levels.
11. Ecological concepts should be given serious consideration as a fruitful approach for a unified language of the two fields.

The recommendations and ideas above are only a prelude to what Stewart L. Udall referred to in the book, The Quiet Crises, when he said,

A land ethic for tomorrow should be as honest as Thoreaus' Walden and as comprehensive as the sensitive science of ecology. It should stress the oneness of our resources and the live-and-help-live logic of the great chain of life. If, in our haste to 'progress', the economics of ecology are disregarded by citizens and policy makers alike, the results will be an ugly America. We cannot afford an America where expedience tramples upon esthetics and development decisions are made with an eye only on the present.<sup>2</sup>

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<sup>1</sup>See Thompson: "Administration Objectives for Development Administration."

<sup>2</sup>Udall, op. cit., p. 190.

## EPILOGUE

In 1935 the National Resource Committee published the report, Regional Factors in National Planning. The report dealt with the problem of organization in 1935 at a national level. This thesis has attempted to look at organization of public policy making and to suggest new ideas regarding ecology and organization. It is ironic that today we are beginning to awaken to these same problems and cope with them, possibly in a more scientific method.

The author would like to reflect a quote taken from the above mentioned report in the summary chapter. "That there will continue to be sharp conflicts exist over the policies, we have no doubt; such conflicts exist now and have always been present throughout our history."<sup>1</sup> It is in this vein that the author wishes to close, not as a wizard advocating a theoretical model to solve planning problems, but as a practical person ready to understand the existing situation and to hopefully strive for the best possible use of both resource and urban elements in a harmonious development.

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<sup>1</sup> National Resource Planning Committee, op. cit., p. 197.

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