

Landscape Planning Objectives for Developing the Arid Middle East

by

Safei El-Deen Hamed

Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in
Environmental Design and Planning

APPROVED:

Robert H. Giles, Jr. Co-Chairman

Robert G. Dyck, Co-Chairman

William L. Ochsenwald

Saifur Rahman

John Randolph

May, 1988

Blacksburg, Virginia

Landscape Planning Objectives for Developing the Arid Middle East

by

Safei El-Deen Hamed

Robert H. Giles, Jr. Co-Chairman

Robert G. Dyck, Co-Chairman

Environmental Design and Planning

(ABSTRACT)

The purpose of this dissertation is to develop an approach which may aid decision-makers in the arid regions of the Middle East in formulating a comprehensive and operational set of landscape planning objectives. This purpose is sought through a dual approach; the first deals with objectives as the cornerstone of the landscape planning process, and the second focuses on objectives as a significant element of regional development studies.

The benefits of developing landscape planning objectives are discussed, and contextual, ethical, political, social, and procedural difficulties are examined. The relationship between setting public objectives and the rational planning process is surveyed and an iterative model of that process is suggested.

Four models of setting public objectives are compared and comprehensive criteria for evaluating these and other ones are suggested. Three existing approaches to determining landscape planning objectives are described and analyzed. The first, i.e., the Problem-Focused Approach as suggested by Lynch is applied within the context of typical problems that challenge the common land uses in the arid Middle East. The second, i.e., the Inductive Approach, which is currently used by most landscape planners, is examined through studying five key development projects in Saudi Arabia, Bahrain, and Egypt. The third, i.e., the Deductive Approach, is used as a foundation to a proposed Landscape Planning Objectives System (LAPOS).

LAPOS consists of diverse activities with a common purpose: clarifying and quantifying objectives. Ranking objectives within LAPOS is based on the computation of a grand index for each objective. Computing a grand index encompasses measuring six dimensions for each objective, i.e., space, time, population, demand, marginality, and failure index.

Dedication

In the name of God, the Most Beneficent, the Most Merciful.

This work is dedicated to my mother and the soul of my father.

Acknowledgements

I am deeply grateful to God for granting me the guidance and the strength needed to accomplish this work.

I would like to thank all the members of my advisory committee for their support, and understanding.

It is very difficult to separate the valuable help that the committee members have offered, both individually and jointly. Bearing in mind that difficulty, it is still possible to state some of the members specific contributions. The greatest debt of gratitude I owe is to my chief critic, editor, advisor, Robert H. Giles. Professor Giles served not only in the routine chores of commenting upon the work, but above all as my literary and intellectual conscience. I am particularly indebted to him for his assistance in selecting the research topic and in guiding the design and the conduct of the study.

As a co-chairman of my advisory committee, Dr. Dyck has offered personal support, technical advise and generous time which will be always appreciated. Dr. Ochsenwald has been most sensitive to, and understanding of, the historic dimension which is characteristic of this and similar research work. Hence, his input and assistance have been most valuable in upgrading the case studies sec-

tion, clarifying intricate cultural concepts, and balancing the overall direction of the research. Dr. Randolph played a major role during my first year of studies at Virginia Tech. Dr. Rahman's friendly involvement has provided me with personal motivation and faith that the subject is an important one.

Two other persons deserve special credit for their participation in this endeavor; of the University of Arizona and of Nova Scotia Tech. As a former member of my advisory committee, always took the time to read and comment on all aspects of my program of studies, research proposal, and the early draft of this dissertation. In spite of his distant location and tight schedule, accepted to read the whole text and suggested very useful improvements.

Many other individuals have contributed to the research effort reported on in this dissertation. I would like to at least mention and thank some of those who made this study possible.

- , Office of International Affairs: U.S. National Park Service
- , Former Co-ordinator of the United Nation Environment Program in the Middle East
- , Office of International Affairs: U.S. Fish and Wildlife Service
- , U.S. Man and the Biosphere Project
- , FASLA, Wirth Associates
- , FASLA, U.S. National Park Service
- , U.S. National Park Service
- , Resources for the Future
- , International Union for Conservation of Nature
- , ITEC, Lexington, Massachusetts
- , The World Bank
- , King Abdulaziz University
- , University of Maryland

It is likewise a pleasure to acknowledge the word-processing services provided by _____ , _____ , and _____ , and the technical assistance furnished by _____ and _____ Amany Shalaby.

Last, but not least, I extend a very special word of gratitude to my family _____. Not only did they put up, for four years, with my occupation with this arduous task, but they succeeded in providing an environment of enthusiasm and support. Their understanding has made the preparation of this dissertation possible.

Table of Contents

Chapter One: Introduction	1
1.1 Overview	1
1.2 Background	3
1.3 Research Objectives	6
1.4 The Scope of the Study	8
1.5 Research Setting	9
1.6 Definition of Terms	13
1.6.1 Problems of definition	14
1.6.2 Operational definitions of objectives and related terms	16
1.6.3 Operational definitions of landscape planning, development, and related terms ...	18
Footnotes	28
Chapter Two: The Nature of Landscape Planning Objectives	31
2.1 The Essence of Objectives	32
2.1.1 Studying objectives through Islamic eyes	32
2.1.2 Instinct versus willed intention	34
2.1.3 Reactive and proactive approaches	34

2.2 The Positive Roles of Objectives	35
2.3 Contributors to Objectives Research	37
2.4 Arguments Against Setting and Adopting Objectives	39
2.4.1 Contextual difficulties	40
2.4.2 Ethical difficulties	41
2.4.3 Political difficulties	42
2.4.4 Social difficulties	44
2.4.5 Procedural difficulties	46
2.5 Summary	48
Footnotes	50
Chapter Three: The Process of Setting Objectives	53
3.1 Exploring the Landscape Planning Processes	54
3.2 Approaches to Setting Objectives	61
3.3 Evaluating Approaches to Setting Objectives	65
3.3.1 Output-related criteria	66
3.3.2 Process-related criteria	67
3.3.3 Feedback-related criteria	67
3.4 Achieving a Proper Environment for Objectives	68
3.5 Existing Approaches to Determining Objectives	72
3.5.1 The problem-focused approach	72
3.5.2 The inductive approach	73
3.5.3 The deductive approach	74
3.6 The Search for the Premises of LAPOS	75
3.7 Summary	77
Footnotes	79
Chapter Four: From Problems to Objectives: Challenges of Developing The Arid Middle East	81

4.1 Problems of Pastoralism	82
4.1.1 Low productivity of livestock	82
4.1.2 Extreme fluctuation of the quantity and the quality of suitable rangelands	82
4.1.3 General disturbance of the delicate balances of rangelands	83
4.1.4 Increasing conflict and competition between crop production and animal husbandry	83
4.1.5 The lack of concern of governments for the pastoral way of life	84
4.1.6 The hostility of modern governments to the mobility of pastoralists	85
4.1.7 The inhibiting conditions of the economic system of pastoralism	86
4.2 Problems of Irrigated Agriculture	86
4.2.1 Irregularity of water supply	87
4.2.2 Mismanagement of water resources	87
4.2.3 Salinization of soils	88
4.2.4 Problems of soils	88
4.2.5 Economic evaluation of agricultural projects	89
4.2.6 Associated health problems	90
4.3 Problems of Rain-fed Agriculture	90
4.3.1 Irregularity of rain	91
4.3.2 Soil erosion	91
4.3.3 Cessation of rotation system	92
4.3.4 Intrusion on grazing lands	92
4.4 Problems of Urban Development	93
4.4.1 Problems of climate	94
4.4.2 Problems of city origins	95
4.4.3 Problems of human resources	95
4.4.4 Problems of existing institutions	96
4.4.5 Problems of basic needs	98
4.5 Problems of Industrial Development	99
4.5.1 Problems of water resources	100

4.5.2 Problems of human resources	100
4.5.3 Problems of economics	101
4.6 Problems of Recreation and Tourism Development	102
4.6.1 Problems of the marketplace	103
4.6.2 Problems of competition for resources	104
4.6.3 Socioeconomic problems	104
4.7 Discussion and Summary	105
Footnotes	107

Chapter Five: Key Development Projects in the Arid Middle East: Examples of the Inductive

Approach	110
5.1 Introduction	110
5.2 The Saudi Arabian Scene	111
5.2.1 Asir National Park	113
5.2.2 Jubail Industrial Town	123
5.2.3 Discussion and assessment	128
5.3 Environmental Conservation in Bahrain	130
5.3.1 Background	130
5.3.2 Landscape resources	132
5.3.3 Objectives of Al-Areen	133
5.3.4 Al-Areen master plan	134
5.3.5 Discussion and assessment	135
5.4 The Egyptian Scene	137
5.4.1 The landscape personality	137
5.4.2 A 6000-Year Goal	138
5.4.3 The Aswan High Dam	140
5.4.4 The outstanding goal	141
5.4.5 Jabal Elba Conservation Areas	143

5.4.6 Discussion and summary	146
Footnotes	148

Chapter Six: Conceiving, Designing, and Managing a Landscape Planning Objectives System 153

6.1 The Key Questions	153
6.2 A Conceptual Framework of the Landscape Planning Objectives System	154
6.2.1 The first phase: Determining	158
6.2.2 The second phase: Organizing	158
6.2.3 The third phase: Assessing	159
6.2.4 The fourth phase: Managing	159
6.3 Designing the System	160
6.4 The Nature of the Process	161
6.5 Determining Landscape Planning Objectives	161
6.5.1 The basic premises	161
6.5.2 Screening public objectives	163
6.5.3 The central office of public objectives	163
6.5.4 Sources of objectives	166
6.5.5 Preparing the list for public forums	167
6.6 Organizing Landscape Planning Objectives	169
6.6.1 Overview	169
6.6.2 Significance-based methods	170
6.6.3 Temporal-based methods	174
6.6.4 Spatial-based method	174
6.6.5 Action-based methods	177
6.6.6 Multi realm-based methods	179
6.6.7 Sector-based methods	184
6.6.8 Synthesis	186
6.7 Assessing Landscape Planning Objectives	187

6.7.1 Analyzing the dimensions of objectives	189
6.7.2 Weighted importance of dimensions	202
6.7.3 The grand index	203
6.7.4 The processed list	207
6.7.5 The evaluators	207
6.8 Managing Landscape Planning Objectives	210
6.9 Summary	211
Footnotes	213
Chapter Seven: Summary and Discussion	217
7.1 The Field of Landscape Planning	217
7.2 The Arid Regions of the Middle East	218
7.3 Research into Objectives	221
7.4 Some Ideas for the Future	224
7.5 Limitations of LAPOS	225
Footnotes	228
Appendix A.	229
Appendix B.	230
Appendix C.	232

List of Illustrations

Figure 1.1. The context of landscape planning objectives research	4
Figure 1.2. Map of the arid lands of the world.....	10
Figure 1.3. Map of the Middle East.....	12
Figure 2.1. Fitting human objectives within various levels of certainty knowledge	33
Figure 2.2. Characteristics of alternative clients of a landscape planning project	47
Figure 3.1. Eckbo's approach to creative decision-making	55
Figure 3.2. The technical decision-making approach as used by McHarg and as modified by Rouse.....	58
Figure 3.3. An iterative model of the planning process with a built-in feedback and feedforward opportunities	60
Figure 3.4. Zube's concept of goals and objectives in landscape evaluation	63
Figure 3.5. The four stages in the evolution of landscape planning consciousness	69
Figure 5.1. Map of Saudi Arabia showing the location of Jubail Industrial Town and Asir National Park	112
Figure 5.2. Map showing the boundary of Asir National Park	114
Figure 5.3. Jubail Industrial Town and surrounding region.....	126
Figure 5.4. Al-Areen Wildlife Park and Reserve.....	131
Figure 5.5. Map of Egypt showing the location of: A. The Aswan High Dam, B. The New Valley, C. Qattara Depression, D. Jebel Elba.....	139
Figure 6.1. A conceptual framework of the proposed LAPOS	155
Figure 6.2. Elements and procedures of the proposed LAPOS	157
Figure 6.3. Significance-based methods of grouping objectives.....	172
Figure 6.4. Significance-based techniques of grouping objectives by two Muslim authors.....	173
Figure 6.5. The major ecosystem groups of the World	176
Figure 6.6. Lee's decline and growth objectives.....	178
Figure 6.7. Lee's maintenance and improvement objectives	180

Figure 6.8. Multi realm-based typology	182
Figure 6.9. Sector-based typology	185
Figure 6.10. General procedure for computing the grand index used in ranking objectives within LAPOS.....	191
Figure 6.11. Defining the space dimension of an objective	193
Figure 6.12. The dimension of demand within LAPOS.....	198

List of Tables

Table 1.	Percent of areas of lands threatened by desertification according to their land uses.	13
Table 2.	Comparison of steps involved in the process of setting objectives according to various authors.	65
Table 3.	Demonstration of the computation of the grand index for two objectives (A) and (B)	208

Chapter One: Introduction

1.1 Overview

This dissertation brings together two topics: landscape planning objectives and the unique problem of developing the arid regions of the Middle East. The dissertation reviews literature, presents a conceptual analysis, examines case studies, suggests a comprehensive system for classifying public objectives, and reports empirical research on both topics. The main objective of these efforts is to design and assess a comprehensive and practical approach for setting landscape planning objectives.

This study is intended to provide landscape planners and political decision makers of the Middle East with some tools and concepts that will be helpful to them in the process of development. In most of the Middle Eastern countries, as in much of the Third World, what constitutes development is very loosely defined. The terms "development", "planning", and "landscape" frequently have emotional connotations. Gaining a clear understanding of these terms, as well as other related ones, is an important first step leading to articulating issues involved in formulating, classifying, measuring, and setting landscape planning objectives.

This dissertation is presented in seven chapters. The first chapter begins with a general discussion of the importance of objectives in landscape planning, especially as distinguished from other fields of planning. In the same chapter, both primary objectives and secondary objectives are listed, the scope and setting of the research are defined, and central terms are discussed and defined.

Chapter Two examines the essence of landscape planning objectives by enumerating their roles, listing the contributors to related research, analyzing the arguments regarding their use, and exploring their sources.

Chapter Three analyzes the process of setting landscape planning objectives. Four models for setting landscape planning objectives are described, analyzed, and evaluated. No generalized recommendations are made since the context of each region and, indeed, each project is unique. The chapter identifies three existing approaches to determining landscape planning objectives. They are the Problem-Focused, the Inductive, and the Deductive Approach.

In order to examine the theoretical bases suggested in the first three chapters, Chapters Four, Five and Six focus on investigating each of the three identified approaches to determining objectives.

Chapter Four analyses the trends affecting the arid Middle East using Lynch's "Problem-Focused Approach." The analysis is classified into six groups of problems, each of which is associated with a common land-use in the Middle East. Chapter Five examines the "Inductive Approach" through an empirical analysis of several case studies of key development projects in Saudi Arabia, Bahrain, and Egypt. The Chapter also presents a brief history and thus delineates the context of landscape planning in the Middle East. A major emphasis of Chapter Six is to develop the "Deductive Approach" into a useful system to quantify and structuring landscape planning objectives. Concepts are outlined and developed within the chapter. The designed system treats landscape planning objectives as a single construct with six dimensions. These dimensions are defined and analyzed, and a suggested procedure for ranking objectives is presented.

Conclusions, with a short discussion of key points developed in the body of the dissertation, are found in Chapter Seven.

1.2 Background

Life is full of objectives that are set by people in connection with their personal affairs or their everyday work, and so it is in landscape planning. However, there are special needs in landscape planning because it is now, and is becoming even more, a field of particular importance to the survival of many human societies as well as to the quality of life of others. These special needs have arisen because of the following: a) conflicting demands for use of land, b) increasing needs for defining of monetary returns from land investments, c) changing values and objectives in almost every society, d) new-found interest by planners and political decision-makers to use objectives once they are stated, and e) new laws which have required planning and have thus raised the prominence of objectives (1).

Setting objectives has traditionally been a part of every comprehensive planning process. It is considered the first step, or at least an early step in all planning, and is as relevant to landscape planning as any other kind of planning (2). On the whole, objectives can be considered a cornerstone of the landscape planning process because they constitute an essential basis for public and private decision making (Fig. 1.1).

Branch, an authority on comprehensive planning, asserts that, "If asked to outline the planning process, most planners today place setting objectives as the first step, with the rest of the process derived from this initial statement". To emphasize the significant role of objectives, he states, "Insofar as any one part of the closely interconnected process of comprehensive planning can be singled out, planning objectives are the most important" (3). As technology and human societies become more complex, it becomes increasingly more difficult to identify, formulate, and develop objectives. Furthermore, a landscape planner, is concerned with many objectives that are usually addressed by a variety of programs for diverse client groups often in conflict with one another.

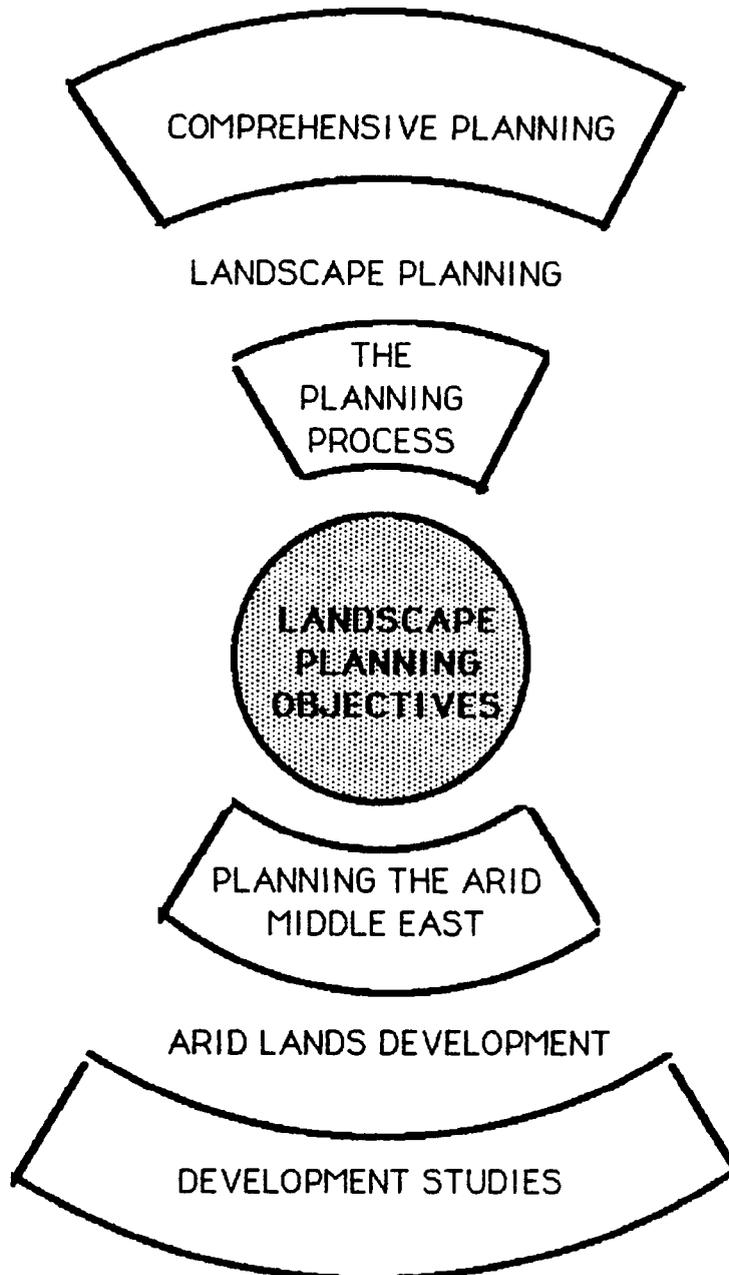


Figure 1.1 The context of landscape planning objectives research. Studying landscape planning objectives is carried out in this dissertation through a dual approach. The first deals with objectives as the cornerstone of the comprehensive planning process. The second focuses on objectives as a significant element in regional development.

Client groups are unable, in most cases, to determine, articulate, or assign relative importance to their objectives. When faced with difficult, unfamiliar issues, people often formulate poor and even incoherent objectives. In such situations, where people do not know precisely what they want, the objectives they express may be highly open to change, poorly listed, imprecisely stated, and/or inappropriately scaled. Even subtle differences in how issues are posed, objectives phrased, and responses elicited can have marked effects on people's responses if they are asked to express preferences (4).

Confusion about public objectives when a society is faced with crisis has been observed during the recent drought (1980-85) across Ethiopia, Sudan, and sub-Saharan Africa. The impact of such a drought has shown the vulnerability of people living in developing nations within arid and semi-arid regions. It has also demonstrated that landscape planners are not yet sure how to confront the age-old challenging question of how to coexist with and perhaps thrive in arid and semi-arid environments.

While some groups have focused their efforts on alleviating the immediate problems of the famine that was caused by the drought, others have suggested that an optimum objective involves dealing with the causes of the drought through a careful landscape planning approach. Ideally, the purpose of such an approach would be to reconcile the diverse objectives of people competing for the use of the land to produce a landscape in which human civilization could prosper without destroying the natural and cultural resources on which many societies are founded (5).

The pivotal role of clearly stated and carefully analyzed landscape planning objectives is evident. When they are well articulated, they become the basis for powerful adaptive and corrective action by decision makers. It is an assumption of this dissertation that developing a well-conceived set of objectives is a critical feature of landscape planning because it can focus attention on the relevant priority requirements for conservation, stimulate appropriate public action, raise public consciousness, overcome apathy or resistance, and aid in coordinating the efforts of governmental and non-governmental organizations (6).

The need for clearly stated objectives has been voiced since the early 1970's throughout landscape planning literature (Lynch, 1971; Wetterberg, 1974) as well as that of administration and management (Feinberg, 1969; Giles, 1972), health planning (U.S. Dept. HEW, 1977), and wildlife management literature (Giles, 1969, 1971, 1978). Since the literature review has revealed only a few examples of sets of landscape planning objectives which could be assessed as operational or in active use, it is believed that the need still exists. The literature is particularly scarce in documents addressing the development of the arid Middle East. A search has also shown that existing studies on objectives are fragmented among a host of useful but narrow and specialized studies. Ideally, the proposed approach should take in the whole complex of natural as well as cultural resource objectives of the arid Middle East, encompass both quantitative and qualitative dimensions, consider levels as well as types, and balance advantages as well as disadvantages of using them. Ultimately, such an approach should articulate a process of structuring landscape planning objectives as well as provide a guide for their evaluation.

1.3 Research Objectives

The primary objective of the study reported herein is to develop an approach that may aid decision makers in the arid Middle East and elsewhere in formulating comprehensive, operational sets of objectives as integral parts of the landscape planning processes. The following are secondary objectives:

1. To explore and analyze the essence, roles, problems, and the techniques of setting objectives.

This includes:

- a. to state the significance of setting objectives.
- b. to determine the roles of objectives.
- c. to examine the arguments about setting objectives.
- d. to outline available techniques for setting objectives.

2. To list and classify the sources, types, and interactions of landscape planning objectives for the arid and semi-arid regions of the Middle East. This includes:
 - a. to examine the process of setting an objective.
 - b. to list the sources of landscape planning objectives for the arid and semi-arid regions of the Middle East, and to identify the principal decision makers who state and use objectives.
 - c. to survey and categorize the relations of various types of landscape objectives (i.e., ecological, socioeconomical, cultural) to the planning process in general and the objective-setting phase of the process in particular.
 - d. to identify the relations the sources and authors of landscape planning objectives.
3. To design a comprehensive system for acquiring and quantifying landscape planning objectives. This includes:
 - a. to compare, contrast, and evaluate current approaches for expressing landscape planning objectives and to propose an alternative approach or approaches.
 - b. to design a system for acquiring and quantifying landscape planning objectives based on the above survey.
4. To provide an overview of the present role of landscape planners in developing the arid and semi-arid regions. This includes:
 - a. to define and detect models of development in arid and semi-arid regions of the Middle East.
 - b. to describe the role of landscape planning in regional development.
 - c. to survey the potentials and problems of landscape planning in arid and semi-arid environments.
 - d. to identify current trends in landscape planning which may influence the future development of arid and semi-arid regions of the Middle East.
5. To assess the potential utility of existing and proposed approaches for setting objectives within the context of the arid and semi-arid regions of the Middle East.

It is beyond the realm of this dissertation to do formal testing and evaluation of the approach proposed in various ongoing landscape planning projects.

1.4 The Scope of the Study

Landscape planning is an extensive, complex, decision-oriented activity. The scope of the research required to improve the decisions involved is enormous, but it is imperative for landscape planners to have an intellectually respectable rationale for what they are doing. This is particularly significant because landscape planning is a relatively new and emerging field. Related academic programs and research activities are still in their infancy. Many scholars believe that the future advancement of this field lies in part in developing landscape planning theory. A useful by-product of this dissertation is a set of observations that might contribute to such a theory. These may also be helpful to the future development of such marginal environments as those of the arid Middle East.

Theoretical research is broadly defined as studies leading to development of theory, and the examination of the logic thereof. It is distinguished from empirical research in being primarily concerned with "asking questions" or "raising problems", while the latter focuses on "gathering data" and "finding solutions". Also, there is a basic difference between scientific theory and planning theory. Scientific theory has to do with "what is", rather than "what should be". For the purpose of this dissertation, and at the risk of over generalizing, it can be said that scientific theory has to do with "how" things are as they are and "why", while planning has to do with "what should be" and "how".

To explore the research frontier of landscape planning necessitates differentiating between: a) theories used to comprehend the milieu within which planning operates, and b) theories of how planning itself works. The theory of planning, in general, is concerned with the latter as opposed to, for example, "economic theory" or "social theory", which planners and others use to structure their understanding of economy and society (7). It can then be argued that procedural or

programmatic theory is distinct from other theory and that this distinction holds for all types of planning, i.e., landscape planning, social planning, or economic planning.

This dissertation is an attempt to develop part of a landscape planning approach through theoretical research. The expected results may become part of the landscape planning and development process, and a cornerstone for establishing a procedural theory of landscape planning. Since theory and practice are not antithetical but are inevitably and basically interlocked, developing and refining such a theory should be of great interest to the landscape planning practitioner as well as the theoretician. The quest for a landscape planning theory may not only be a vehicle for establishing or re-establishing the role of the landscape planning profession in the scientific age. Such a quest could also become a tool, perhaps the only one, that would aid in securing a wholesome environment with healthy and pleasant places to live.

1.5 Research Setting

There are many reasons why this search for better ways of setting landscape planning objectives is set in the context of the arid and semi-arid regions. First, on a global scale, the arid and semi-arid regions are the dominant landscape. Almost one-third of the land surface of the world is desert and it is spreading (Fig. 1.2). Second, while the arid regions contain only about 15% of the population of the world, which live in some six continents and 60 countries, these regions produce one-third of the food supplies of the world, generate over one-half of the precious and semi-precious metals of the world, and contain most of the known oil and natural gas reserves (8). Third, to modern landscape planners, arid and semi-arid regions represent one of the last frontiers for major urban and rural expansion. It has been suggested that the future development of many arid and semi-arid regions of the world, including the Middle East, hinges upon increasing the usefulness of their most abundant natural resource, the desert itself (9).

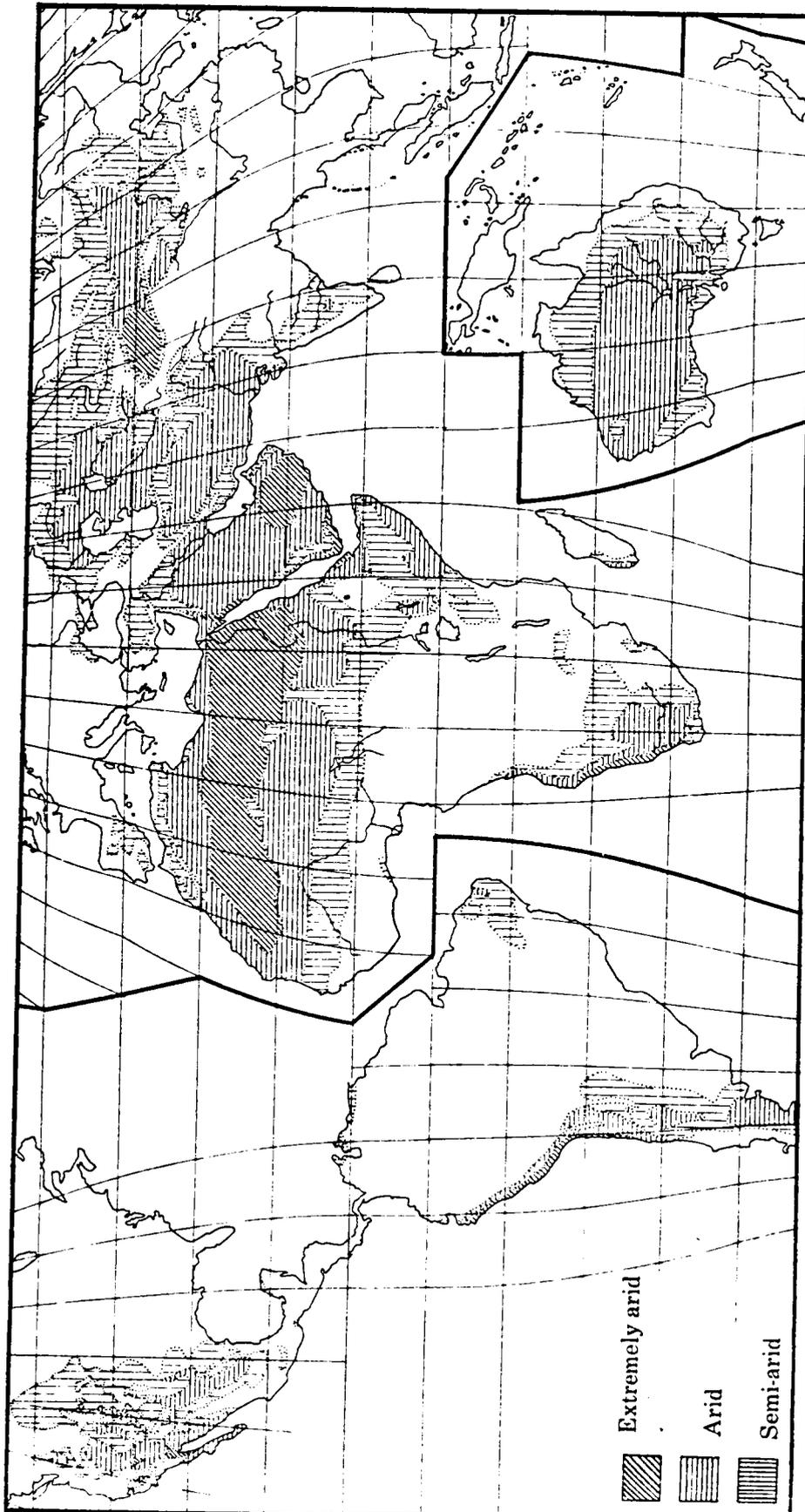


Figure 1.2 Map of the arid lands of the world
Source: Ali and Brown, Landscape Design for the Middle East, (1978)

In the last four decades, arid and semi-arid regions of the world have been growing at a remarkable rate, both in terms of the population living in them and territorial expansion. In many countries, these regions have experienced very high rates of urbanization. In the United States, for example, the statistics of population movement indicate that more and more people who have a choice of where to live are deliberately choosing to live in the semi-arid regions of California, Arizona, and New Mexico (10).

Other reasons have led to focusing on the Middle East as a research setting (Fig. 1.3). First, nowhere is the battle between people and the desert so ancient as in the Middle East (11). Second, the Middle East is currently experiencing explosive urban growth which is causing congestion in circulation, a decline in public services, and indigent conditions within the hinterland (12). Third, the rural areas are facing the danger of desertification. One study has indicated that in various Middle East countries approximately 94% of all pastoral lands, 70% of all rainfed agricultural lands, and 17% of all irrigated land are threatened (13). This and other previously mentioned trends are alarming signals because the arid and semi-arid environments are known to be more susceptible to degradation than other ecosystems (Table 1).

Arid and semi-arid regions are extremely prone to desertification, (i.e., the gradual destruction or reduction of the capacity of the land for plant and animal production) unless used with care and skill (14). Indeed, experts are still uncertain whether the pressure to exploit more of the arid and semi-arid regions would, in the long run, make the deserts bloom or increase their expanse. The problem of desertification is acute even in the United States. At the present time, millions of acres of land in this country are undergoing severe desertification. A more serious problem, however, is the conflicting perception of these regions by the public and decision makers alike. Not only do the deserts themselves represent different things to different people, but also their potential development and development means different things to different people. One group sees the deserts as the future land bank of Earth--a last frontier that humankind can farm and make habitable. Another group perceives them as hostile wilderness, barren wastelands to be left alone. Others see them as a great reservoir of open space particularly favorable for recreational land use and other

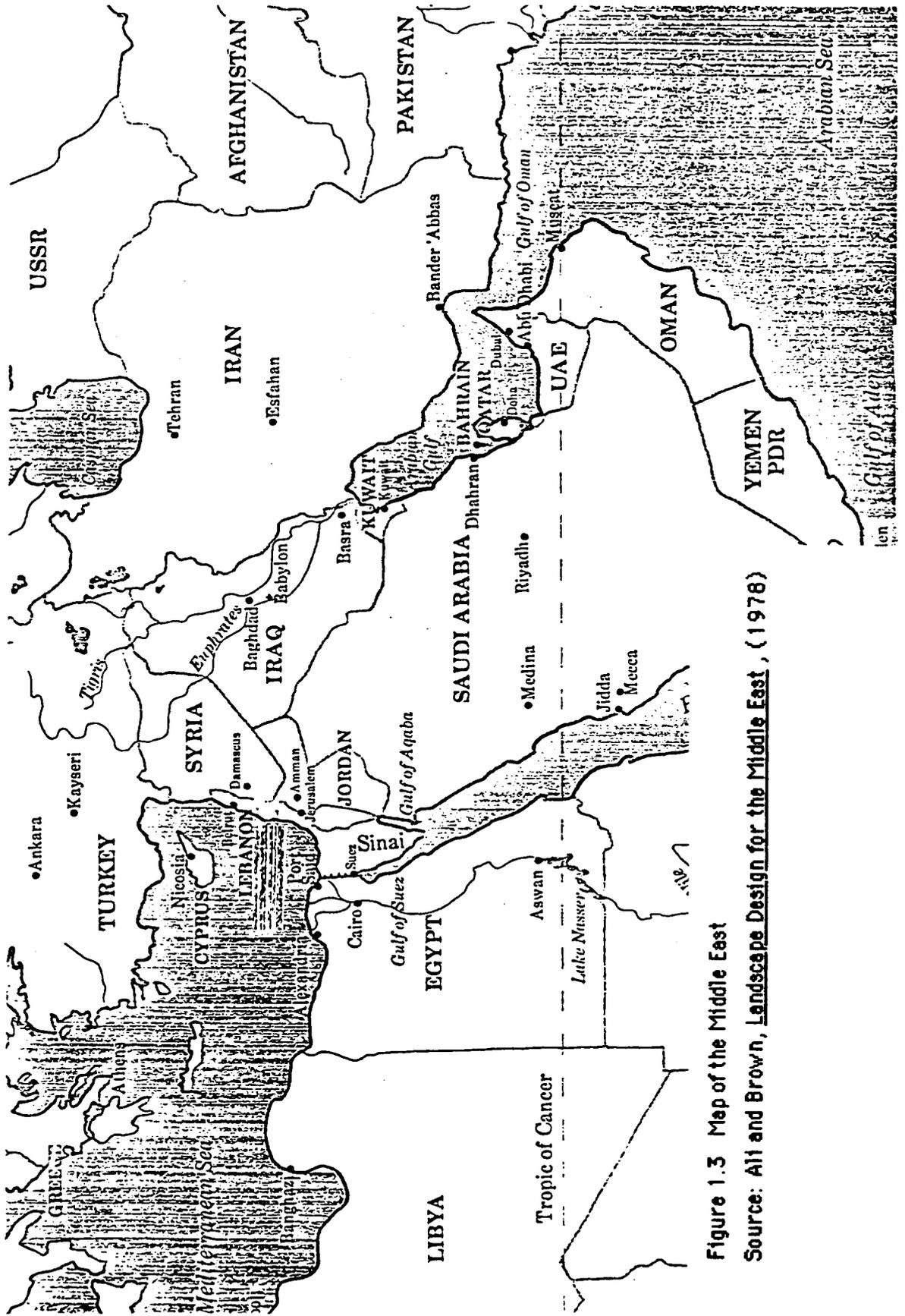


Figure 1.3 Map of the Middle East
 Source: Alt and Brown, Landscape Design for the Middle East, (1978)

Table 1. Percent of areas of lands threatened by desertification according to their land uses.

Country	Percentage of Threatened Irrigated Agricultural Lands	Percentage of Rainfed Agricultural Lands	Percentage of Threatened Rangeland
Sudan	16	74	98
Egypt	26	20	97
Libya	8	80	95
Morocco	20	80	94
Algeria	22	89	92
Somalia	9	95	90

Source: United Nations Environment Program 13 (1977).

tourism-related projects. Finally, some groups see the deserts as historically and ecologically significant, reflecting their cultural heritage and thereby worthy of preservation.

In brief, landscape planning objectives for the arid and semi-arid regions of the Middle East have been chosen to limit the scope of this dissertation. The choice has also been made for reasons of familiarity, national and international significance, and the apparent lack of effectiveness by others addressing the problems of their development.

1.6 Definition of Terms

A developed system of language is a prerequisite to developing a useful body of knowledge. Such a system has not yet been developed for the field of planning in general, or for the evolving field of landscape planning in particular. In contrast to most scientific disciplines where the terms em-

ployed are carefully defined and experiments precisely described, "the meaning, comparability, and usefulness of much of the planning literature today is severely limited by inconsistent use of terms" (15). The terminology related to the objective-setting phase of landscape planning, in particular, is very confusing. Therefore, it seems desirable to begin a dissertation of this nature with precise definitions of basic concepts. Nevertheless, there are fundamental difficulties in arriving at such definitions. These difficulties are discussed here, and operational definitions of the seven central terms, i.e., values, goals, objectives, landscape planning, development, region, and arid zones are stated.

1.6.1 Problems of definition

The problems of definition reflect fundamental and on-going challenges to all researchers in landscape planning. Such challenges need to be acknowledged, even if they cannot be conclusively resolved. The importance of considering what a major planning concept means has been stressed by a few scholars. Campbell, for one, states that over 80 different concepts used in reference to behavioral dispositions (including goals, values, objectives, etc.), are essentially equivalent (16). Recent discussions have indicated that much planning research is surrounded with conceptual confusion. Giles and Sirgy, for example, note that:

The literature and definitions of "missions", "goals", "criteria", "standards", "guidelines", "purposes", "needs", "policy", and "objectives" is very large and excessively conflicting and confusing. Several fields use the words consistently within a field but are at odds between fields (17).

Others, such as Abraham Kaplan, suggests that any field need not concern itself with what usually may be termed "showing what a concept really means". Instead, each field needs to devise operational or nomic definitions which when observed to occur, justify application of the term. He has concluded that there is an ineluctable vagueness in terms, and the preoccupation with removing this vagueness should not be overstressed by researchers (18). Nevertheless, writers need to continue to seek to be sufficiently precise and unambiguous.

Among an array of terms related to objectives, there are some for which any differentiation is simply arbitrary or based on judgement. Others seem readily differentiable. "Goals", "objectives", "aims", and "purposes" are among the former group of undifferentiable terms, while "values", and "mission" are most likely among the latter. Difficulties in defining the terms related to "objectives" include the following items:

a. Limited basic underpinnings:

A sound foundation to validate the theories addressing the origins and the nature of objectives does not exist. A primary difficulty in researching human objectives is that they are neither visible events nor subject to scientific validation. Even the parsimonious and well-known concept of objectives within Maslow's Need Hierarchy has been challenged as not valid in representing a relatively discrete typology of behavior (19).

b. Overlap between purposeful concepts:

The term "objective" is sometimes difficult to differentiate from other terms, particularly "goals", "aims", "purposes", and "targets". These and other similar related terms seem to involve concepts which overlap with each other. Specifying a general set of mutually exclusive terms for application to these overlapping concepts may be impossible.

c. Interrelatedness of referents among various concepts:

In many instances the attainment of one specific level of goals, objectives, or aims is often closely related to the attainment of another, either hierarchically and/or laterally. Determining causality, therefore, is very difficult.

The preceding discussion demonstrates the limitations involved in agreeing on a general definition of "objectives", which may justify using that term in preference over others. Human motivation is so complex that these difficulties will be encountered in most of the concepts proposed for its analysis. While most other parts of landscape planning are subject to investigations of root-causes and primal sources, this part is not yet subject to such studies. It seems, then, that the concept

referred to by the word "objective" is both elusive and complex. Such complexity and elusiveness will frustrate attempts at general definition, but they are, nevertheless, worthwhile. They should eventually aid, in spite of some arbitrariness, in clarifying the use of "objective" within this study and establishing a standard or benchmark for later development.

1.6.2 Operational definitions of objectives and related terms

On the whole, all teleologic concepts have in common a reference to attaining, retaining, or avoiding certain conditions, objects, or circumstances. The following definitions relate to the quality of this avoidance, retainment, or attainment.

- Value

A value, as used herein, is not an entity. It is not a thing or concept as implied in: "honesty is a human value". A value is a representation (or expression of such feeling) of importance attached to a thing or a concept. It is a characteristic of that thing (or concept) which an individual or a society considers worth acquiring, protecting, keeping, or preserving. Expressed emotions and stated desires represent the form that values take in the activity of the individual. A value is a general conception of the desirability or the relative goodness of a thing (a physical entity), or condition, end-state, or circumstance of life that tends to influence and guide human choices. Most definitions of values emphasize their abstract, ideal, and/or far-reaching nature. Values are relatively vague and unspecific, and differ in time, place, or object. Although they may occasionally be inferred from observation of group or individual behavior, they are concepts and thus cannot be directly observed. Because they may be vague, it is difficult to infer their nature. Because they can be expressed, their existence (but not necessarily accuracy or validity) is not doubted.

Value need not be expressed in real terms or universal measures but may be expressed in relative terms in a specific context. For example, a value of A may exceed that of B, or the value A may be 2.5 times that of B.

- Goals

Goals are general desires or intentions whose achievements are so hopeful, distant, and indefinite that they cannot be formulated and programmed with sufficient specificity to be incorporated quantitatively in a plan. They set the general attainments toward which policies and planning objectives are broadly directed. On the whole, planning authors have tended to differentiate between a goal and an objective in the following ways:

- a. A goal is a general direction for action, while an objective is a specific and measurable target.
- b. A goal is ongoing and never fully achieved, while an objective may be conceived as achievable.
- c. A goal is mostly fundamental (to prevent its sudden change or abandonment), while an objective may be subsidiary.
- d. The relative importance of objectives in comparison to other objectives may shift more than that of goals.
- e. A goal is a concept of the end or final condition, while an objective is a relatively specific desired output or intermediate condition of a system.

- Objectives

Objectives are more specific than goals. They are statements of intentions and/or expressions of desired objects, conditions, situations, or opportunity states that a person or a group seeks to attain or retain. There are no satisfactory roots for the words goals and objectives. Usage is by agreed definition and varies widely among and within professional groups.

While a goal may be reflected in and attained through the achievement of a single objective statement, some goals require a number of objectives. As statements of specific intentions within a planning process, objectives are paths toward realizing a goal(s).

Since objectives are stated as means to the end of achieving goals, the subjectivity of the decision-makers preparing them is latent in the final objective statements. In making values observable, the writers of objectives are required to make the subjective explicit. In so doing, they are made to face the strengths and weaknesses of their biases with regard to the goal sought and the context in which it is set. An objective does not carry the connotation of goodness or value in itself. Stated properly, objectives can be read, understood, and evaluated by most of those concerned. They are a step toward consensus among decision-makers and those whom they influence.

1.6.3 Operational definitions of landscape planning, development, and related terms

Landscape planning scholars have noted a need for fundamental discussions that might contribute to some international agreement about terminology (20). Therefore, it is useful to those discussions and essential for efficiency in this research to present a system of terminology. This section on definitions will summarize and clarify the existing array of extremely diverse uses of terminology like landscape planning, regional development, comprehensive planning, land-use planning, and arid landscape.

- Landscape

The term 'landscape' means different things to different people at different times. The word is the old English 'landscape', which refers to "a parcel of land under an identifiable ownership, either by an individual or by a group" (21).

In the late 17th century, the term 'landscape' took on a different meaning. Influenced by the Dutch painters, the word 'landscape' evolved to mean "all that can be seen on the Earth's surface from a particular point" (22).

Webster's New International Dictionary of the English Language presents a dual definition of the term. Landscape is described as "a portion of land or territory which the eye can comprehend in a single view, including all the objects so seen, especially in its pictorial aspect". Such a subjective connotation has caused considerable difficulties to environmental scholars who tried to employ the term as a scientific concept. Confronted with the reference to a physical area on the one hand, and with a perceived term on the other, landscape was labeled as inexact. It failed to meet the "objective reality" required by science. The environmental scientist, therefore, remained skeptical of the concept of landscape. In addition, he was later joined by the geographers and the regional planners who echoed the same argument.

Some landscape scholars have attempted to address the confusion caused by implying a legal concept from early England; an artistic notion from Holland; and a physical one from the United States. Spencer, for one, asserts that a planner who employed regional data or sought to explain an entire landscape is "seldom preoccupied with what is visible or invisible, material or non-material, for there can be no finite limit placed upon the variety of data with which he must deal in his effort to depict the operation of man in his chosen landscape" (23).

One of the most rigorous discussions that attempted to define the word "landscape" and to clarify the issues involved is included in Common Landscapes of America (24). The author defines the term as follows:

Landscape is a slippery word. It means more than scenery painting, a pleasant rural vista, or ornamental planting around a country house. It means shaped land, land modified for permanent human occupation, for dwelling, agriculture, manufacturing, government, worship, and for pleasure. A landscape happens not by chance but by contrivance, by premeditation, by design; a forest or swamp or prairie no more constitutes a landscape than does a chain of mountains. Such land forms are only wilderness, the chaos from which landscapes are created by men intent on ordering and shaping space for their own ends. But landscapes always display a fragile equilibrium between natural and human force; terrain and vegetation are molded, not dominated. When men wholly dominate the land, when they shroud it almost completely with

structure and chiseled space, landscape is no longer landscape; it is cityscape, a related but different form.

Another useful definition has been presented by the late Angus Hills; a prominent Canadian landscape planner (25). He writes:

Landscape is the mosaic formed by variations in the many combinations of non-living and living systems which interact within the ecosphere encircling our planet. This world wide pattern reflects not only differences recognizable in the component features themselves but differences in the effectiveness of the various levels of these features when they interact with different combinations of the other features.

The last two definitions by Stilgoe and Hills imply and perhaps lead to Gold's notion that the landscape "stands for a degree of perfection for man; it is a preferred location and is thus humanized" (26). Therefore, desirable planning of the landscape is an effort to achieve a delicate balance between human forces and natural forces.

The preceding historical survey of definitions may also suggest that the concept of landscape has been, and probably will remain, an important concept to environmental scientists, geographers, and regional planners, among others. It also suggests that noticeable confusion has persisted throughout the years in using and defining the term. Nevertheless, one may detect several common notions in most definitions. They are that landscape:

- is a human construct
- is a mosaic of the living and non-living
- is continually changing through human interactions
- is the result of the interplay between human cultures and the physical environment or between human forces and natural determinants
- does not happen by chance; it happens by contrivance, premeditation, and design
- is land modified for human purpose. This, of course, is a crucial point to this study since it could be argued that an element of redundancy may be present in the term "landscape objectives".

Considering all of the previous discussion, it is suggested that landscape within this dissertation be studied using the following definition: A landscape is a spatially bounded, time-specific,

idealized portion of land, air, and water, which can be visualized or conceived and communicated by a particular person or group.

- Landscape planning

In the early 1970's, the Environmental Planning Commission of the International Union for Conservation of Nature and Natural Resources (IUCN) prepared the following definition and discussion:

Landscape planning is a continuing process that strives to make the best use for mankind of the limited area of the earth's surface while conserving its productivity and beauty. Its aim is to reconcile the needs of competing land uses and to incorporate them into a landscape in which man's civilizations can prosper without destroying the natural and cultural resources on which societies are founded. Based on an understanding of the nature and potential of landscape, it endeavors to conserve and create the widest diversity, which implies a landscape capable of multiple use; in a way, it is creative conservation, since it may involve deliberate modification of existing landscapes.

The basis of landscape planning is survey and analysis. They are as important a component of basic planning as the more widely recognized methods used in economic and social development. Data on the physical features of the land are recorded and their interaction or interdependence are assessed. Various specialists concerned with climate, water resources, geology and soils, topography, the living content of the landscape, scenic qualities and visual landscape characteristics, features of special scientific or cultural significance, as well as the effect on all these of human interventions, are involved in this compilation. Survey and analysis should always precede the design process.

This approach is essential if development, management and maintenance of a landscape are to be guided to create a healthy environment and viable landscapes in which the long term interests of mankind always prevail and in which a choice of further development is left for future generations.

The IUCN concept is well presented and worthy of historical note but the text is lengthy and lacks a focus.

In the same year, Barlowe succeeded in defining landscape planning more concisely than the IUCN Commission.

Landscape planning is one of several inputs in the comprehensive planning process (along with economic planning and social planning). It is an action-oriented process with goals of avoiding and resolving conflicts in the use of land. Planning is the opposite of improvising. In simple terms it is organized foresight plus corrective hindsight (27).

Laurie views landscape planning as a dual activity with specific intentions.

Landscape planning can be seen as a positive process to fit certain land uses to the most suitable land for the purpose and as a negative process designed to prevent ecological loss or waste of natural resources such as good agricultural soil or clean water (28).

After comparing other definitions which were suggested by various pioneers of landscape planning such as, Crowe (1969), and McHarg (1969), and Hackett (1971), he concludes the following:

Landscape planning consists of a scientific aspect concerned with research and a shaping aspect based on the research; the parts result in the production of a policy statement. The landscape plan sets out the framework and lines of action by which the landscape is adjusted in accordance with ecological principles to meet the needs of changed circumstances. Its process can be divided into four stages, 1) survey and analysis; 2) evaluation; 3) policy or design solution; and 4) implementation.

In an attempt to compare and contrast the two fields of landscape planning and environmental planning, March presents the following definition:

Landscape planning represents one of the major areas of environmental planning that addresses both relatively new topics associated with development and land use, such as toxic waste disposal and urban microclimate, as well as traditional ones, such as watershed management and site planning. To some extent, landscape planning is a term of convenience used to distinguish the activities of what we might call the landscape fields (geography, landscape architecture, geomorphology, and urban planning) from other areas of environmental planning (29).

March argues further that even environmental planning is a "catch-all" type of term, but it helps in differentiating between a) planning and management activities in which environmental factors are central considerations, and b) similar activities in which socioeconomic or political factors are the central concerns. He also suggests that approximately two decades ago, the term "land-use planning" was typically used for the same sort of activities which are currently covered by several new environmental subfields. March concludes that, on the whole, the environmental fields have developed into roughly three main groups: environmental sciences, environmental engineering, and environmental planning.

The preceding review of definitions has demonstrated the variety of concepts involved in landscape planning. Instead of analyzing each of the five definitions in detail, it is suggested that evaluation criteria be formulated. A good definition is one which meets or comes closest to the following criteria:

- be inclusive of most elements of most definitions
- be concise
- define or include a concept of time

- define or include a concept of place
- define the population
- ensure that there is no noticeable omission in areas of work conventionally called "landscape planning"
- stand the test of generalization without being easily faulted
- be acceptable by several scholars of the field

It is therefore suggested that landscape planning, within this dissertation, be studied using the following definition.

Landscape planning is a rational activity integral to the comprehensive planning process. It includes four continuing, usually sequential but often parallel tasks: survey, analysis, design, and evaluation. The results should guide society's actions and aid decision makers in: a) maximizing the wise management of both natural and cultural resources; b) stabilizing or improving the productivity, beauty and diversity of the landscape; and c) reconciling the needs of competing land users. Successful landscape planning optimizes the above in time and space subject to retaining potentials and flexibility for future decisions.

- Development

The Webster Encyclopedic Dictionary defines "development" as "the act, process of developing, or state of being developed". It also defines the verb as follows:

To make more available or usable; to evolve the possibilities of; to make active something latent; to advance; to further; to promote the growth of.

The way "development" has often been used, particularly by national and regional planners, makes it synonymous with "economic development" or "material development". This is obviously a narrow and non-functional definition. Many scholars, therefore, have attempted to address the issues and misconceptions normally associated with "development" as a concept in planning. Wells, for one, draws a useful comparison between what he considers development and what he considers growth. He suggests that:

Growth implies an increase in substance, while development involves an increase in substance and improvement in structure. Growth means a proliferation of structural elements already existing while development is marked by the rise of new structural elements. Growth is measured quantitatively, while development is both quantitative and qualitative (30).

Obviously Wells views development as a condition that could be measured. This stance coincides with McGinnis who defines development as a comprehensive measure of social organization, or a condition that embraces and accesses the following items:

- Basic life support systems (food, water, shelter, clothing, health).
- Opportunities for individual expression and self realization (personal freedom, opportunities in education, opportunities for meaningful work).
- Sustainable relationships with the natural environment (including renewable and non-renewable resources).
- Social solidarity (equity, mutual concern, meaningful social projects) (31).

Another view of development is as a process. For example, the International Union of Conservation of Nature (IUCN) defines development in World Conservation Strategy as follows:

Development is the modification of the biosphere and the application of: a) human, b) financial, c) living and non-living resources to satisfy human needs and improve the quality of human life (32).

The three previous definitions stress the importance of achieving a holistic and qualitative level of performance in a system. In simpler terms, economic development problems cannot be meaningfully separated from development problems of other sorts: environmental, psychological, cultural, social, political, attitudinal, religious, etc.

Based on the previous survey, development, within this dissertation, is defined as follows:

Development is a set of activities undertaken within a system (geographic or otherwise) to address specific potentials and problems facing the people of that system. When successful, development creates conditions that maximize the chances of people realizing their set of objectives.

- Arid Zones

The term "arid" is defined in the Webster's New World Dictionary as "dry and barren". The literature uses the term "arid" and "desert" synonymously. Aridity is defined as an expression of water deficiency; and water deficiency is also influenced by factors such as soil moisture and permeability, evaporation, transpiration by plants, and the intensity and duration of sun light and wind (33).

Arid ecosystems occur in regions with less than 254 mm (10 inches) of annual rainfall, or sometimes in hot regions where there is more rainfall, but where it is unevenly distributed in the annual cycle. The greatest expanse of the arid regions of the Middle East lies between the north and south latitudes of 15 and 30 degrees.

The arid zone has a common characteristic in that the climate everywhere is judged to be too dry to permit successful growth of crops in an average year. The arid regions are comprised of a series of four major desert types. Jointly, they form four graded continua of environmental complexes. They include: a) natural rainless deserts, b) natural rainfall deserts, c) natural run-off deserts, and d) human-created deserts.

Natural rainless deserts are areas where rainfall does not recur annually. They are, in most instances, situated in regions transitional between tropical (summer rainfall) and Mediterranean (winter rainfall) climates.

Natural rainfall deserts are still below the requirements of sustained crop production: usually 100-200 mm/year with clear seasonality (34).

The natural runoff desert has some rainfall. Though low (less than 100 mm/year) and variable, rain is an annually recurring phenomenon.

Extensive portions of the human-created deserts are found in the semi-arid steppe country (rainfall more than 250 mm/year). They have been transformed into deserts due mostly to ill-advised land-use pressures (35).

- Region

The concept of a region has been a pre-occupation of many planners, geographers, and development-studies scholars. It has many definitions.

On the whole, geographers and planners tend to view regions as "formal units". This perspective is notable throughout such definitions as:

- An area whose physical conditions are homogeneous
- A complex of land, water, air, plant, animal, and humans regarded in their special relationships to constitute a definite characteristic portion of the surface of the Earth.
- An area characterized throughout by similar surface features when contrasted with neighboring areas
- An area in which all places have certain common characteristics by virtue of which it is distinct from the surrounding areas
- A portion of the surface of the Earth defined and distinguished from adjacent areas by some homogeneity in its natural features, its climate, people, interests, involvements, or administrative controls
- A multi-jurisdictional area, an anthropological entity, an economical unit, a biophysical unit, or a watershed
- A complex of geographic, economic, and cultural elements that is found as a finished product in nature
- A human construct that is not solely the creation of human will and fantasy, but like its corresponding artifact, i.e., the city, is a collective work of art

The term regional implies a level of thinking that involves a geographic area larger than a "site". This area may range from a portion of a county to several states.

Thus, it is suggested that for each landscape planning effort, i.e., for developing a policy, program, or project in which objectives may be relevant, the planning region is a relatively homogeneous physical area affected by the collective biophysical, political, economic, and sociocultural factors.

Footnotes

1. R. H. Giles Jr., "A Procedure for Developing Functional Objectives for Community Planning", 1982, Dept. of Fisheries and Wildlife Sciences; VPI, Blacksburg, Va.
2. W. Goodman and E. Freund (Eds.), Principles and Practice of Urban Planning (Washington, D.C.: The International City Managers' Assoc., 1968), p. 190.
3. M. C. Branch, Comprehensive Planning (Pacific Palisades, California: Palisades Publishers, 1983), p. 74.
4. B. Fishchhoff, P. Slovic, and S. Lichtenstein, "Poorly Thought-out Values: Problems of Measurements", In Conn, W.David, Energy & Material Resources: Attitudes, Values, & Public Policy (Boulder: Westview, 1983), pp. 39-54.
5. V. Vanicek, "Definition of Landscape Planning", Landscape Planning, Vol. 1 (1974), p. 65.
6. International Union for Conservation of Nature and Natural Resources, World Conservation Strategy (Gland: IUCN Publications, 1980), p. 8.2.
7. C. Paris, Critical Readings in Planning Theory (London: Pergamon Press, 1982), p. 5.
8. R.L. Heathcote, The Arid Lands (London: Longman Group, 1983), p. 296.
9. A. M. Farahat, "Energy, Environment and New Communities in Hot-Arid areas of the Middle East", (Ph.D. Dissertation, VPI & SU, 1980), p. 9.
10. J. Tyrwhitt, "Living with the deserts", Ekistics, Vol. 258 (1977), pp. 243-245.
11. T. C. Ali and J. Brown, (Eds.), Landscape Design for the Middle East (London: RIBA Publications, 1978), p. 7.
12. A. H. Felemban, "Regional Development Planning: A Case Study in Saudi Arabia", Ekistics, 284, (1980), pp. 360-368.
13. S.I. Ghabour, "Developing the African Deserts", Development and Environment (April 1978), p. 57.
14. International Union for Conservation of Nature and Natural Resources, p. 16.8.
15. M. C. Branch, Comprehensive Planning (Pacific Palisades, California: Palisades Publishers, 1983), p. 1.

16. D. T. Campbell, "Social attitudes and other acquired behavioral dispositions", in Sigmund Kock (Ed.) Psychology: A Study of a Science (New York: McGraw-Hill, 1963), Vol. 6, pp. 94-172.
17. R. H. Giles Jr. and M. J. Sirgy, A General Systems Perspective in Setting Objectives for Faunal Systems, Blacksburg, Va., 1985. (Unpublished Manuscript)
18. A. Kaplan, The Conduct of Inquiry (Scranton: Chandler Publishing Co., 1964), p. 13.
19. H. G. Rainey, "Comparing Public and Private Conceptual and Empirical Analysis of Incentives", (Ph.D. Dissertation, Ohio State University, Columbus, 1977), p. 22.
20. A. E. Weddle, "Landscape Planning-Aims and Scope of a New Journal", Landscape Planning Vol. 1 (1974), pp. 1-5.
21. R. P. Larkin and G. L. Peters, Dictionary of Concepts in Human Geography (Westport, Ct: Greenwood Press, 1983), p.139.
22. Ibid.
23. J. E. Spencer, East by South: A Cultural Geography (New York: Wiley, 1954), p. vii.
24. J. R. Stilgoe, Common Landscape of America (New Haven: Yale University Press, 1982), p. 3.
25. A. G. Hills, "A Philosophical Approach to Landscape Planning", Landscape Planning, Vol. 1, 1974, 339-371.
26. J. R. Gold, An Introduction to Behavioral Geography (Oxford: Oxford University Press, 1980), p. 141.
27. R. Barlowe, Land Resource Economics: The Economics of Real Property, 2nd Edition, (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972), p. 11.
28. M. Laurie, An Introduction to Landscape Architecture (New York: Elsevier Publishing, 1975), p. 10.
29. W. M. March, Landscape Planning: Environmental Applications (Reading, Mass.: Addison-Wesley Publishing Co., 1983), pp. 2-3.
30. R. F. Wells, "Application of the Principle of Minimization of Entropy in the Achievement of Steady-State Solutions for Dynamic Systems", (Ph.D. Dissertation, VPI & SU, Blacksburg, Va. 1974), p. 7.

31. J. B. McGinnis, Bread and Justice (New York: Paulist Press, 1979), p. 10.
32. IUCN, World Conservation Strategy (Gland, Switzerland: IUCN Publications, 1980), p. 1.
33. C. Hodges (ed.), Aridity and Man: Challenge of Arid Lands in the United States (Washington, D.C.: The American Association for the Advancement of Science, 1963), p. 21.
34. M. Kassas, "National Parks in Arid Regions", in Second World Conference on National Parks (Gland, Switzerland: IUCN Publications, 1972), pp. 199-208.
35. Ibid., p. 201.

Chapter Two: The Nature of Landscape Planning Objectives

At all levels of regional development and landscape planning there is ample evidence that equally competent decision makers disagree on the correctness of important decisions. These disagreements are becoming more crucial because of the investment and risks involved, the number of people affected, the length of time that land may be impacted, and the costs of delays. Quantity and quality of information, different visions of the future, and different ways of processing the available information are key reasons for such disagreements. Also, such disagreements are due, perhaps primarily, to the differences among the objectives of the decision makers. By exploring and analyzing objectives, the conflicts can be better understood, and then improved statements of them may reduce the areas of disagreements or suggest alternatives.

Some planners notice that decision makers are interested in discussing projects or programs, but very few are interested in discussing objectives. They often note that the benefits are numerous in making the decision process more explicit in terms of its objectives. The aim of this chapter is to make this process more explicit and the concept of objectives and their creation less vague.

2.1 The Essence of Objectives

2.1.1 *Studying objectives through Islamic eyes*

The search for truth is a life-long activity of many humans. The quest for certainty occupies a significant place in the cultures of the Middle East. For example, a typical Muslim believes that all Truth is in itself certain. But as received by people, and understood with reference to people's intellect, certainty may have various degrees. The Holy Qur'an includes three degrees or levels of "yaqin" (certainty of knowledge): "ain-ul-yaqin"; "ilm-ul-yaqin"; and "haqq-ul-yaqin". The first, "ain-ul-yaqin", may be literally translated as certainty of sight. This is the certainty resulting in seeing (or inspecting) something with the human eye (or other human senses). The second, "ilm-ul-yaqin", refers to the probability or certainty resulting from the appraisal of evidence (as in science) or the human power of judgement (as in logic). The third, "haqq-ul-yaqin", refers to the absolute Truth, with no possibility of error of judgement, human sense-perception, or in any ancillary aids (1). This seems to occur in religious revelations and metaphysical states. It is the position or the conviction of the true believer (Fig. 2.1). Human objectives fit with difficulty within the Quranic level of "yaqin" for they are not sensed phenomena nor absolute truth. They are most akin to the ilm-ul-yaqin level. Objectives clearly exist but require much study and concentrated attention. They originate in the human mind and then are conveyed to the outside world. In an attempt to understand the essence of objectives, Giles asserts, "Objectives are not knowledge, not factual, not discovered; they are created. They are articulations of individual and group value and belief systems (2)."

Human objectives and all other personal and public motivations are evidently complex concepts. They are extremely difficult to translate, or to "map down" in such a way as to be exclusive and exhaustive. The crux of the difficulty is in specifying how common concepts are related to each

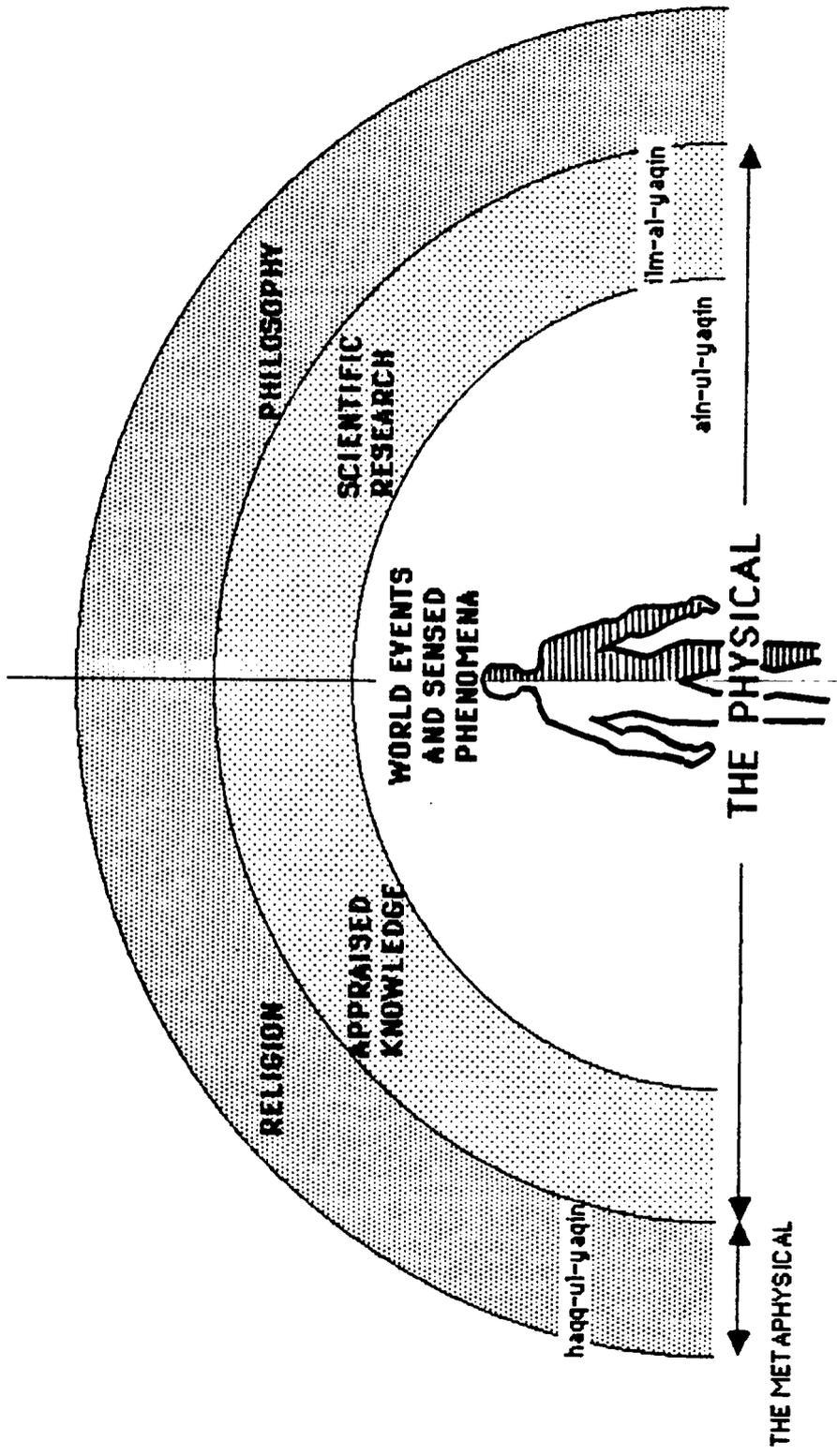


Figure 2.1 Fitting human objectives within various levels of certainty of knowledge
 The main difficulty in researching human objectives is that they are not factual. Instead, they are created in the human mind. They are neither sensed events nor subject to classical scientific testing.

other and differentiated from each other. Such difficulty is noticed in the case of all teleologic human behavior of which that directed toward setting objectives is one category.

2.1.2 Instinct versus willed intention

The human mind seems to arrive at its objectives by at least two means. The first is essentially innate and instinctive. It includes physiological basics such as getting nutritious foods; breathing clean air, drinking adequate water, and insuring self-preservation through reproduction. Involuntary means of arriving at objectives are outside the focus of this dissertation and will not be discussed further. The second means is characterized by being based on intentional actions, i.e., requiring a free exercise of the human will. Accordingly, human actions which are motivated by objectives may be called "intentional" while all others are known as "instinctive."

2.1.3 Reactive and proactive approaches

In Site Planning, Lynch states that starting from a list of existing problems is one of many design techniques known to planners (3). He believes that such a technique has some advantages since it is likely to produce practicable solutions and it is easy to justify. Also, Lynch argues that since most people tend to be better at identifying problems than at detecting potentials, objectives for developing a site may arise directly and easily from their present problems. Ackoff calls these kinds of objectives reactive objectives. He asserts that they are extremely motivating to humans. He writes, "We tend to be moved more by our dislikes than our likes, more by our hates than our loves" (4).

Ackoff indicates that the reactive objectives involve the destruction, removal, or control of something that is present but not desired. They may be distinguished as description of what begins and ends within the sensed world in which theories and laws of physical sciences govern all operations.

Ackoff also suggests that a second way of formulating objectives exists. He calls it proactive. In defining the proactive way, Ackoff indicates that it involves the efforts to attain or acquire something that is absent but desired (5). In other words, proactive objectives are descriptions of what begins in the human mind and, thus, are not easily observable. Once the intended action materializes, this same human objective may be embodied in an end in the external world in which it could be both observed and measured. The ability to conceive this type of objective appears to be a rare talent.

2.2 The Positive Roles of Objectives

Although the form of the activity may vary from project to project and from planning approach to planning approach, setting objectives is nevertheless an integral part of the landscape planning of any region. With the landscape architect involved in projects of greater and greater complexity, the value of setting objectives will probably also grow from a means of "getting to know the problem" to that of an instrument which limits and directs the planning process. In the past, setting landscape planning objectives was a superficial act, utilizing familiar or banal-like statements which had little or no direct influence on the operations of planning.

In discussing that condition, Lynch states:

Planners' reports are full of talk about objectives and goals. But a careful reading of most of them will prove how imperfect a set they are. Very often it is Pollyanna talk--so general and high-minded that no one could object, much less use them to discriminate among real alternatives (6).

Lynch also believes that the ultimate function of an objective or a criterion is to provide a rule for choice among alternative possibilities.

Some thinkers believe that objectives are visions and indispensable components in the quality of life on Earth. Churchman, for example, writes:

The ideal planner must not give up his vision, even though in reality it fails over and over again. Indeed, his vision is a part of reality, and were the human race to lack it, it would die as a species, even though the rituals of daily living went on (7).

In theory, objectives can be used in each step of the landscape planning process because they provide the purpose for action. Giles, for one, suggests many reasons why objectives are useful in the decision-making process and why they should be stated:

- They can focus group efforts, thus increase efficiencies.
- They tend to improve the morale and cooperativeness of people involved.
- They allow and encourage improved evaluations of performance, benefits, and costs.
- They provide guidance for unique decisions.
- They enable decision aids to be created, appropriate processes to be automated.
- They can be a stabilizing influence during the time of changing circumstances.
- They can communicate the community "essence" or personality to all others.
- They trigger autonomous and creative solutions from the citizens of the region.
- They provide the basis for operation and management activities.
- They reveal and clarify hidden objectives.
- They reduce the frustration caused by objective-less behavior (8).

The importance that is attached to stated objectives in the planning fields was indicated by Goodman and Freund who define planning as a "series of related actions and decisions that are organized around and moving toward the accomplishment of objectives" (9). Tec, on the other hand, believes that "planning is the ability to direct individual or group behavior to recognized, predetermined objectives" (10). Central to both definitions is the notion of directed action and a pre-defined end. One may suggest, therefore, that setting objectives is a key step in landscape planning.

2.3 Contributors to Objectives Research

Setting objectives is a task that requires a thoughtful and penetrating analysis into many factors affecting the decision process (11). Almost all fields of knowledge have contributed, in their way, to the efforts of understanding better the intrinsic nature of objectives. Several studies of objectives and their morphology have been carried out by psychologists. They have examined the process of setting objectives from a variety of viewpoints yet with a common hypothesis which embraces two notions: a) setting objectives must be understood as it relates to the course of life as a whole, and b) stating objectives is one of the most human of acts (12).

Another field that has contributed to the study of setting objectives is systems analysis/systems engineering. For example, Hitch suggests that the first element in a system is "an objective which we desire to accomplish" (13). Quade, a military systems analyst, asserts that "systems analysis is undertaken primarily to suggest or recommend a course of action. This action has an aim or objective". He says that the basis of assessing and evaluating all policies, strategies, forces or equipment is: "How well and cheaply they can accomplish this aim" (14).

Natural sciences in general and systems ecology in particular have also contributed to the study of objectives. Several authors voice the numerous advantages of making objectives more explicit within the decision-making process. Giles and Sirgy, for example, present a general systems model to help managers of faunal systems to set objectives. They also suggest an approach for analyzing and expressing objectives through an eight dimensional scale which includes time, space, risk, population, demand marginality, variety and substitutability (15).

In recent years, managing by objectives has been a striking concept in management sciences. It is recognized today as an effective way of getting results in business organizations. Large numbers of firms report achievements of a most astounding and profitable nature.

The term "management by objectives" first appeared in the literature as a way of promoting a team approach in the work place. As Drucker says, "Business performance requires each job be directed toward the objectives of the whole business" (16). With such an approach, results do not just happen. Rather, resources, time, and energy are heavily committed to plans and activities designed to attain specific objectives that determine, by definition, the success (or failure) of the enterprise. Business leaders and management scientists have reported several benefits that are experienced as a result of managing by objectives. Mali lists these benefits as follows:

- 1) improvements are made in the job of managing;
- 2) profit attainment is less a happenstance;
- 3) accurate performance appraisals can be made;
- 4) motivation to achieve is heightened;
- 5) management skills may be developed;
- 6) teamwork is coordinated; and
- 7) organizational clarity is developed (17).

The contribution of various planning fields, including landscape planning, to research efforts regarding objectives is rather limited. Thus far, there seems to be no comprehensive work which examines that subject from the landscape planner's point of view.

This dissertation attempts to provide such a point of view. In the past, the profession of landscape architecture has traditionally relied on creativity, intuition, and subjectivity in most of its decisions. Increasing complexity of problems, the expanding volume of data, and the varying size of the site involved in development projects have pointed to the need for design principles and approaches that can deal with complexity and handle large, diverse quantities of information. From this evolving need, landscape planning has emerged as a sub-speciality of landscape architecture.

Zube, in "Landscape Planning at a Crossroads", outlines four frontiers in landscape planning during the last century (18). These frontiers have been associated with developing regional open space systems, the pioneering work of landscape architects and others in development at regional scale, the interaction with the environmental movement of the 1960's, and recent scientific advancements including computer applications and recent remote sensing uses. It is important to note that the first three frontiers mainly involved growth in the scope of landscape planning while the fourth

implied a change in the way in which landscape planning projects and programs were handled. It is more significant, however, to realize that expanding the domain on the one hand and improving the technology on the other have not been paralleled with adequate development of methods and problem-solving processes. Very few studies have addressed these processes adequately. Among these few exceptions is Design for Human Ecosystems: Landscape, Land Use, and Natural Resources by J. T. Lyle (19). Therein, the author discusses in detail modes of human thinking and their impacts on the various stages of the design process, the conventional methods of rational planning, and the pragmatic method (often known as disjointed incrementalism). These and others will be discussed further in the next chapter entitled "The Process of Setting Objectives".

2.4 Arguments Against Setting and Adopting Objectives

There are many tangible and intangible advantages in stating and adopting objectives; however, the counter condition is evident. Evidently, there is no easy or straightforward answer to the logical question: Why is it that all communities and decision makers do not construct comprehensive sets of objectives? Five types of difficulties are involved. They will be examined in this chapter.

Most planners attest to the theoretical importance of defining and stating various types of development objectives. However, they can readily attest to the great difficulty of establishing a set of operational community objectives (20). The difficulty may explain why most professionals have conveniently disregarded this component of planning. Lynch points to the deficiency:

It also makes evident how many criteria are actually involved in design and how badly they are stated--most of them commonly being unconsciously assumed, stated vaguely, or accepted as fixed 'standards' incapable of adjustment (21).

In discussing the errors in stating goals and objectives, Lynch writes:

The objective will be set at too low a level, easily connected to a decision, i.e., 'all streets to be 60-feet wide,' or all new growth to be in the form of satellite towns.' These decisions are legitimate enough, but by failing to ask if there is a more general reason lying behind the decision, the range of possibilities has been unnecessarily narrowed (22).

He continues to discuss other possible errors:

Other objectives may be unrealizable, still others essentially irrelevant. Some will be very narrowly motivated, the values of an individual or a small group being imputed to the whole community. Or the motives may be narrow in time, dealing only with the immediate present and its problems, so that the plan can do no more than react to immediate difficulties, and is unable to make choices for the future. Or if the objectives are future-oriented, they may be rigidly fixed, without room for change as situation and aspiration change (23).

Poorly formulated objectives are not unique to any specific community or any specific region. In addition, only few societies have agreed on a set of objectives or priorities for these objectives.

The following are arguments against setting and adopting landscape planning objectives. The arguments are based on contextual, ethical, political, social, and procedural difficulties.

2.4.1 Contextual difficulties

Setting landscape planning objectives is ideally conducted within an appropriate public participation forum. Such a forum is subject to a number of handicaps including:

1. Active participation of all parties concerned may cause considerable delay in the planning process. Although most landscape planners claim the advantages of a set of objectives in terms of saving time, the practice of acquiring and quantifying objectives takes much time. The immediate and evident costs of acquiring objectives and the costs usually accompanying delays may appear to exceed any hoped-for gains.
2. Timeless objectives seem to take too much time to formulate. For decision makers who are facing immediate crisis, their current ordeal usually takes priority over everything else. Any other investment is normally perceived as a luxury, if not a waste of resources, which they cannot afford considering current and pressing problems.
3. The task demands a commitment for a relatively long period from the participants. This implies that it may be very difficult to retain suitable participants throughout (24).

4. Setting objectives is an intellectual activity that implies a concern about the future and requires some personal and public investment and resource allocation. A planner who is assigned the task of developing a list of objectives may not have enough long-term commitment to a project, area, or population.
5. Some objectives, by their very nature, may require trying out new ideas. Applying such untried ideas may lead to a victory or a failure. In both cases, the consequences may be inherited by someone else in the future.
6. In real life, a neat progression, beginning with public awareness of environmental issues, following with their articulation into landscape objectives, and ending with well-defined projects and programs, rarely exists. The process goes back and forth and often appears, because of the nature of the evidence, to be just as usefully worked in reverse order. Since each landscape is unique and each population is unique, each planning project varies from the others. It may be impossible to conceive of a sufficiently large and homogeneous population to establish testable hypotheses about the best sequence of the process. These varying and inconsistent pathways seem to complicate any effort to predict or link behavior to objectives.
7. Some regions, particularly in the arid Middle East, have not produced explicit statements about their community's objectives or even general environmental goals. At the other extreme are regions where there is an over-abundance of statements, some duplicative or conflicting.

2.4.2 Ethical difficulties

Ethical difficulties include:

1. The landscape planner's dilemma is, perhaps, that he or she is neither a scientist nor a politician. As an expert, he or she is often assigned the role of an unprejudiced advisor in public

participation procedures. Some people, however, may perceive these experts to be biased because they represent the government (25). It may also be argued that since each individual has different perceptions of the environment and of the future, landscape planners are also influenced by their perceptions and their own system of values.

2. Another ethical problem with setting objectives in particular and planning activities in general, is that they both could be seen as amoral. Churchman writes:

It [planning] wants to tell people how a part of their lives should be led. So it's bossy. And if it succeeds in implementing, it imposes its will on others; it becomes a case of people telling people what they must do. The spirit of morality is outraged (26).

3. On the whole, there are many unanswered and perhaps unanswerable questions about the ethical side of setting landscape planning objectives. They include such issues as:

Whether 20th century people know enough about themselves and the environment to warrant setting goals and objectives for the near or the distant future--whether the present can and should bind the future to its own purposes--can one assume that humans will make decisions that contribute to the accomplishment of future objectives, even when the decisions are in conflict with more immediate demand (27).

2.4.3 Political difficulties

Given the limited knowledge that experts profess and the imperfect public participation process within which landscape planning objectives are developed, careful attention to political climates is essential. Branch, for one, believes that, "Politics is not only the most important single element of comprehensive planning, but also the chief obstacle to its attainment in the United States "(28). There are several political problems that may be potentially obstructive. They include the following:

1. A major problem in having a well articulated set of landscape planning objectives is related to their straightforward accountability. Most politicians and planners are aware that the lack of ambiguity is actually a two-edged blade, since different groups may have different objectives. Some of them apparently fear its back edge and opt to avoid it by doing without clearly stated objectives.

2. Most planners know from experience how slowly planning decisions are made and also how long it takes to apply them. Furthermore, natural ecological processes, which are at the heart of landscape planning, often take a long time to evolve, while the modern world expects quick results. Public impatience is a major enemy pressuring most politicians.
3. By their very nature, objectives tend to exist in couplets; for every objective there is a reciprocal and competing objective. One pursued to the maximum may operate to override the other, e.g., security versus freedom, growth versus preservation, etc. These are usually difficult choices for decision makers. Seeking worthwhile objectives may be put off because of some unpleasantness that pursuing them may entail at the other end of the couplet. Also, people vary greatly in where they would choose to compromise their conflicting objectives.
4. There is frequent difficulty in combining the landscape planner's advice with other advice received by politicians due to a communication gap between the two. Consequently, politicians often make judgements without the knowledge provided by experts in the field, or without making an accurate assessment of it. This omission may also be due to parts of the lists of objectives being technically too complex to be understood by a non-expert.
5. Most efforts by various governments to attain public participation have been subject to considerable criticism. Wheaton and Wheaton, for example, conclude that many of the public participation exercises in setting objectives have not justified the time and resources spent (29). A more critical author believes that, on the whole, planning objectives have been no more than lists of cliches used to justify plans already made (30). Therefore, it may be harder today than ever to justify or defend the poor results of previous efforts made to acquire and develop community objectives through a process of public participation. Public participation has for many years been a preoccupation of landscape planners, since their field is operating in a very different context today than before. The clientele population has increased in size and has advanced in sophistication. Both democratic and authoritarian regimes must consider political trends and popular pressures. The most challenging problem of public participation efforts is

certainly deciding on the appropriate group of participants. To start with, who are they? The general answer is: Everyone who will be influenced by the planning action. For large planning efforts, however, this may mean large numbers of people. One may ideally argue that the clientele is global and that it should include generations yet unborn. The reality, however, may be that objectives of powerful constituencies must be satisfied. The issue of representation is particularly important since there have been few universally accepted criteria. One-person-one-vote on each objective is clearly impractical where the population is large and the list of objectives is long.

6. Elected and appointed officials may, for obvious reasons, be more interested in re-election or in appointment to higher office than in devoting the extensive time and attention necessary to identify, acquire, develop, classify, and quantify community objectives. Also, these officials are often hesitant to endorse or pursue certain objectives when they do not conform to the precise concerns and expressed wishes of powerful constituencies in the region. Indeed, worthwhile objectives are frequently unspoken or suppressed because of some unpleasantness that pursuing them may entail. In brief, not setting objectives can delay confrontations and, if long enough, changes may be sufficient to avoid any conflict.
7. By not reporting or by reporting sets of public objectives in an obscure way, such a "systematic approach" can easily be reduced to a "scientific facade" over a decision already made. An approach to setting and analyzing landscape planning objectives (like every planning method) offers possibilities to manipulate the political process.

2.4.4 Social difficulties

Most professional planners know from experience the resistance to rational approaches of decision making, among which setting community objectives is a key element. They are also aware that

some of this resistance is rooted in the nature of humans both as individuals and as groups. One may summarize these problems as follows:

1. People dislike thinking about or even acknowledging unpleasant facts. The human capacity to face uncomfortable realities is significantly low (31). In contrast, the purpose of setting objectives is to identify existing conditions, however unwanted and unpleasant they may be, to investigate actual problems, and to formulate recommendations for improvement.
2. People are normally more interested in enjoying the present than worrying about the future. The most influential instinct which motivates humans is self preservation and self interest and not conceptual images and mental constructs of their future (32).
3. Some societies, particularly in the Middle East, implicitly or explicitly discourage or restrict freedom of speech because of their political or religious systems. In such a climate, only a few of the potential participants have the courage to articulate publicly their often hidden objectives.
4. Not everyone can develop objectives. Setting objectives is analytically exacting, necessitating a large range of human knowledge. Using them means facing practical difficulties because of individual reluctance to change. Elkind suggests that only about 30% of all people have developed mental ability to conceptualize the future (33).
5. Landscape planners normally focus on the persons or group of persons who will live in and use the designed area. Therefore, their first step is usually to identify these people. The answer may be obvious enough in a place already in use and may be easy in a private garden or a small site. Unfortunately though, identifying the client(s) (and consequently their objectives) is far more difficult than it may first appear for most development projects.

Lynch, for example, has identified 32 different types of clients. Among all these groups, only two types (No. 1 and No. 3) may be considered helpful to a landscape planner while formulating and

setting public objectives (34). He calls these two types of clients: a) the homogeneous, vocal, known, and present users, and b) the complex, vocal, known, and present users. The 30 others, one may conclude, would be difficult types with which to develop a set of landscape planning objectives. A summary of Lynch's typology of clients is shown in Figure 2.2. It is suggested, therefore, that deciding on objectives cannot be made simply on the basis of the fraction of those not in favor of one objective or another. Instead, the issue of "who" the clients are is an issue itself and should be the subject of wide discussion in the society and rigorous research within the planning community.

2.4.5 Procedural difficulties

Humankind exists in an environment of increasing uncertainty, of continuous change and relative probabilities without exception. No general set of objectives exists in a continuing state. Rather, objectives ought to be regarded as being a dynamic state of various interests, constraints, and visions of the future. Several scholars have addressed these intrinsic characteristics of public objectives.

Holling, for example, writes:

The uncertainties and unknowns encountered in describing an ecological system are almost trivial compared to the ambiguities encountered in defining societal objectives. The objectives that seem so clear at any moment can shift dramatically as testified to by the recent concern for environmental issues. Moreover, as has been discovered by water resource planners in particular, even the best of policy analyses can founder on initially unrecognized or hidden public objectives (35).

With similar tone and pointing to the same issue, Laurie states:

Attitudes change, people move, life is going, and there is always the dilemma that what the people seem to want or need at one moment may be in conflict with long term goals or the needs of others (36).

Knowing how to formulate sets of objectives and what to do with them when formulated has been a big problem. The criteria, algorithms, technologies for participation, and technologies for optimization have not been available. Now some are. These will be discussed in Chapter Six. The preceding discussion suggests that due to the dynamic quality of human motives, public objectives must be examined with enlightened skepticism and used with caution. Indeed, the sometimes ob-

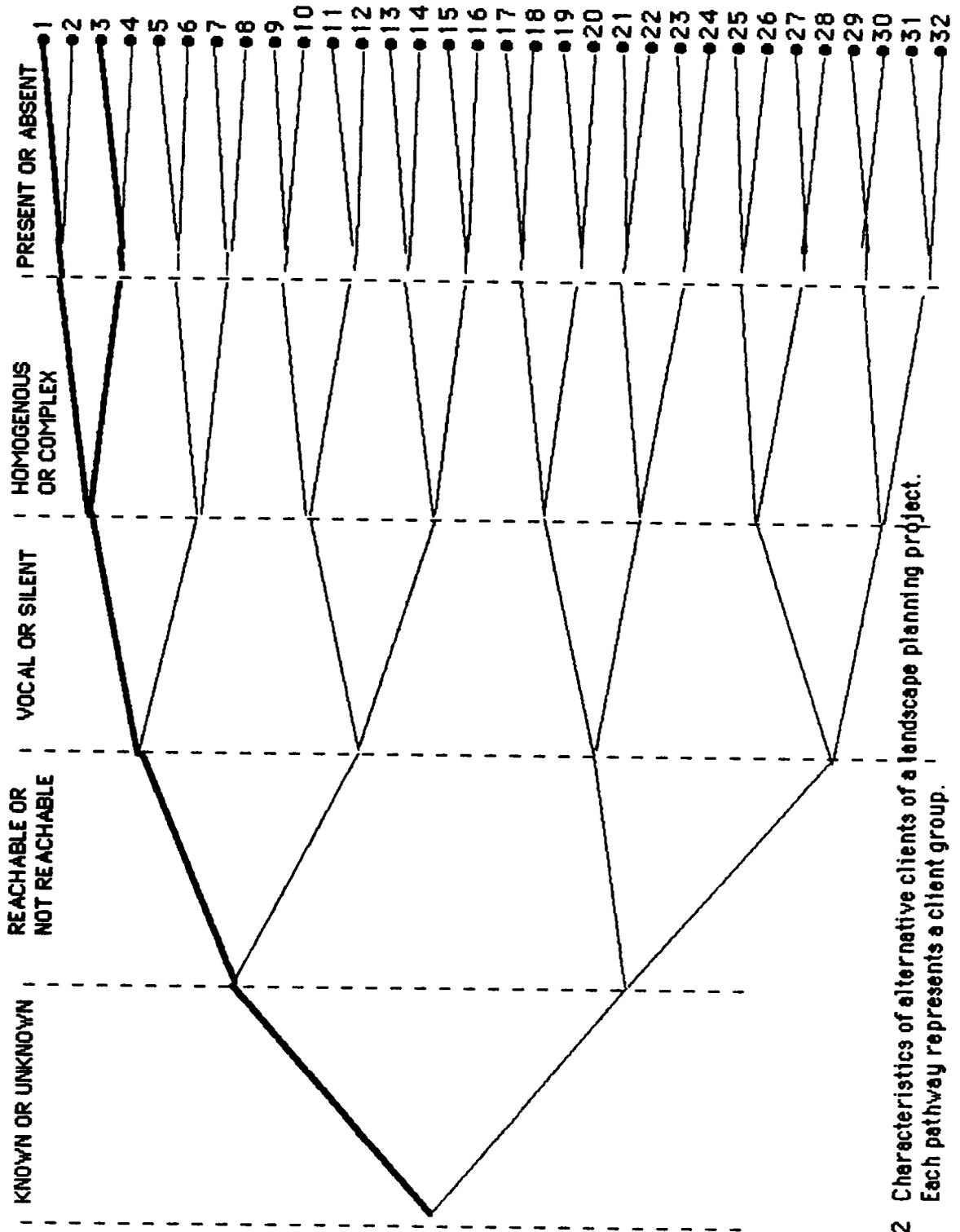


Figure 2.2 Characteristics of alternative clients of a landscape planning project. Each pathway represents a client group.

vious disparity between what an environmental development statement says and how the region's landscape system runs, is often due to the lack of attention paid to updating objectives to take into account changing circumstances. The differences may also be due, among other things, to confusion between values assigned to objectives and the objectives themselves. In brief, relative importance associated with each objective may change, but not the objectives themselves.

2.5 Summary

Stating objectives has both positive and negative sides. The positive characteristics were listed under Section 2.2, "Roles of Objectives". The negative side includes contextual, ethical, political, social, and procedural problems. For all these reasons, it has been much easier for most planners to continue using sets of societal objectives which are often very general, ambiguous, conflicting, otherwise indefinite, and hidden, i.e., simply to accept the status quo or find acceptable a general strategy of adaptation to problems as they arise.

As difficult as setting objectives may be, no one has yet proposed that landscape planning be conducted without them.

The difficulties described in this section do not imply that setting public objectives is impossible. They do indicate that however great the need, it is unrealistic to expect that setting objectives will be continuously welcomed even by those responsible for setting and carrying them out. Reservation to the concept and the activity must be expected and planned for when soliciting and formulating public objectives.

In considering the advantages and disadvantages of setting public objectives, the following conclusions can be drawn. Most of the preceding problems are conditional, i.e., they are only valid under certain circumstances. For example: it is questionable whether the costs, time, and energy required for acquiring objectives will remain as high after systematizing and applying high technology tools

to the process. Also, it is likely that the increasing advances in the world of communication will positively affect the efforts to democratize the planning process in general and setting objectives in particular. By extending the same line of argument, the overall picture for cost-effectiveness, timeliness, and relevance may prove to be more promising than it had first appeared.

The overview of arguments presented in this section may lead to the suggestion that there is no perfect way to formulate a complete and reliable set of landscape planning objectives. This may be true if the aim is to represent perfectly the wide variety of realistic situations. Because there will always be a loss of information, the results will be imperfect. The alternative would be for landscape planners to confine themselves to planning with implicit objectives (or no objectives at all), which has the same (or more) weakness. Given the nature of these three alternatives, it is suggested that pursuing objectives-oriented planning is a rational option.

Footnotes

1. The Holy Qur'an, 102: 3-7; and 69: 51.
2. R. H. Giles and M. J. Sirgy, "A General Systems Perspective in Setting Objectives for Faunal Systems", 1985, Dept. of Fisheries and Wildlife, VPI & SU, Blacksburg, Va.
3. K. Lynch, Site Planning, 2nd Edition (Cambridge: MIT Press, 1972), p.
4. R.L. Ackoff, The Art of Problem Solving (N.Y.: John Wiley and Sons, 1978) p. 17.
5. Ibid.
6. K. Lynch, "Quality in City Design", Who Designs America? (Garden City: Anchor Books, 1966), p. 125.
7. C. W. Churchman, The Systems Approach and Its Enemies (N.Y., Basic Books Inc., 1979), p. 214.
8. R. H. Giles, CAPS - Wildlife: Introduction and Future Potentials, Note #1, 1983, Dept. of Fisheries and Wildlife, VPI, Blacksburg, Va.
9. W. Goodman and E. Freund (Eds.), Principles and Practice of Urban Planning (Washington, D.C., The International City Managers' Association, 1968), p. 19.
10. L. Tec, Targets: How to Set Goals for Yourself and Reach Them (New York: Harper & Row Publishing Co., 1980).
11. Goodman and Freund, 1968, p. 190.
12. C. Buhler and F. Massarik, ed., The Course of Human Life (New York: Springer Publishing Co., 1968), p. 12.
13. C. Hitch, "An Appreciation of Systems Analysis", in Optner, (1973) q.v., quoted in Peter Checkland, Systems Thinking, Systems Practice (New York: John Wiley & Sons, 1981), p. 140.
14. E. Quade, "Military Systems Analysis", in Optner, (1973) q.v. quoted in Ibid., p. 140.
15. R. Giles and J. Sirgy, 1985.
16. P. F. Drucker, The Practice of Management (New York: Harper and Brothers, 1954), p. 121.

17. P. Mali, Managing by Objectives (New York: Wiley Interscience, 1972), p. 5.
18. E. H. Zube, "Landscape Planning at a Crossroads", in Proceedings of the 1985 Annual Meeting of ASLA (Washington, D.C.: ASLA Task Force on Regional Landscape Planning, 1985), p. 12.
19. J. T. Lyle, Design for Human Ecosystems: Landscape, Land Use and Natural Resources 1985, (New York: Van Nostrand Co., 1985), pp. 127-135.
20. Goodman and Freund, 1968, p. 327.
21. K. Lynch, Site Planning (Cambridge: The MIT Press, 1974), p. 278.
22. K. Lynch, "Quality in City Design", Who Designs America? (Garden City: Anchor Books, 1966), p. 126.
23. Ibid.
24. H. Voogd, Multicriteria Evaluation for Urban and Regional Planning (London: Pion Limited, 1983), p. 20.
25. Ibid., p. 21.
26. C. W. Churchman, The Systems Approach (New York: Delta Books, 1968), p. 167.
27. G. Feinberg, The Prometheus Project (New York: Doubleday Anchor Book, 1969), p. 197.
28. M. Branch, Comprehensive Planning (Pacific Palisades, California: Palisades Publishers, 1983), p. 194.
29. W. Wheaton and M. Wheaton, "Identifying the Public Interest: Values and Goals", in Decision Making in Urban Planning (Davis, California: Sage Publications Inc., 1972), p. 33.
30. R.C. Young, "Goals and Goal-Setting", AIP Journal, March 1966, p.79.
31. Branch, 1983, p. 192.
32. Ibid., p. 151.
33. D. Elkind, Children and Adolescents: Interpretative Essays of Jean Piaget (New York: Oxford University Press, 1974) 2nd Ed.
34. Lynch, 1974, p. 99.

35. C.S. Holling (Ed.), Adaptive Environmental Assessment and Management (Chichester, U.K.: John Wiley and Sons, 1980), p. 171.
36. M. Laurie, An Introduction to Landscape Architecture (New York: American Elsevier, 1976), p. 153.

Chapter Three: The Process of Setting Objectives

Experienced designers in landscape planning admit that they are still far from perfecting systematic methods of design, but are probably close to developing design techniques (1). To design a system for identifying, compiling, analyzing and structuring landscape planning objectives, it is necessary to consider the process, the planning horizon, the participants, the users, the inputs, the outputs, and the feedback mechanism. C.W. Churchman believes that humans are able to solve all problems of the world but they are not organized to do so (2). Such a statement emphasizes the significance of organization, of how something is to be done, how to proceed, how to formulate a problem, how to identify an objective, and how to seek and accomplish that objective. Studying the process of setting objectives is a fundamental step towards developing a systematic method of design, one that includes clear steps to be taken. Simonds recommends six strategies to enhance the quality of decision making in landscape design. They are: "to consider the time factor, to coordinate human resources, to clarify clients needs, to improve the approach of gaining information, to advance the methods of predicting results, and to develop better ways of setting objectives" (3). However, setting objectives is a mental process in which only a small portion of the people are capable of participating. Also, it appears that everyone uses somewhat different process for setting objectives. There may be as many processes as there are participants in planning. Confronted by such a likely array, which one is most likely to assure the best results? How can processes and results be evaluated? These questions comprise the theme of this chapter.

3.1 Exploring the Landscape Planning Processes

Based on previous chapters, it should be clear that setting objectives is no simple matter. It is a process which has layers of complexity that may have been beyond the scope of activity of landscape planners until now. Dealing with various concerns and relating to different populations at different times implies a multiplicity of thinking modes and approaches that add to the complexity of the process.

Logicians believe that humankind may ultimately perfect intelligence, if they achieve the perfection of the process by which it is reached. They claim that to understand the essence of a phenomenon, it is necessary to start with the thinking process. Similarly, to manage the complexity of setting objectives, an understanding is needed of how the human mind thinks about objectives in general, and objectives as a part of the landscape planning process in particular. Surprisingly though, the very notion of exploring the design process is itself fairly new to landscape planners. Lyle, for one, has commented on this issue:

Until the mid-twentieth century, no one cared how a designer came up with a design. It was generally assumed to be a somewhat magical leap of intuition, and whether one liked the results or not, one did not question their origins. One simply accepted or rejected them (4).

But professional landscape planners can no longer consider their problem solving methods as self-contained, mysteriously inspired, unrelated and unrelatable to common people. Generally, designers have discussed their thinking process in a way that is characterized by either oversimplification, lack of rigor, or romanticism. Eckbo, for example, in a poetic statement says:

Creative design is a constant balancing of fantasy and practicality. We do not abstract and categorize the world as does science. We are concerned with direct, everyday, physical reality -- with the infinite variety of a world in which no two phenomena are very exactly alike, with similarities, analogies, comparisons, and relations which may be merely visual. We are concerned with the relations between words and facts, between pictures and interpretations (5).

Using the typology stated in Chapter Two, one may suggest that Eckbo sees creative design as a process to balance proactive objectives with reactive ones and intentional objectives with instinctive ones (Fig. 3.1). Nevertheless, his statement raises several questions: Is it possible to maximize both

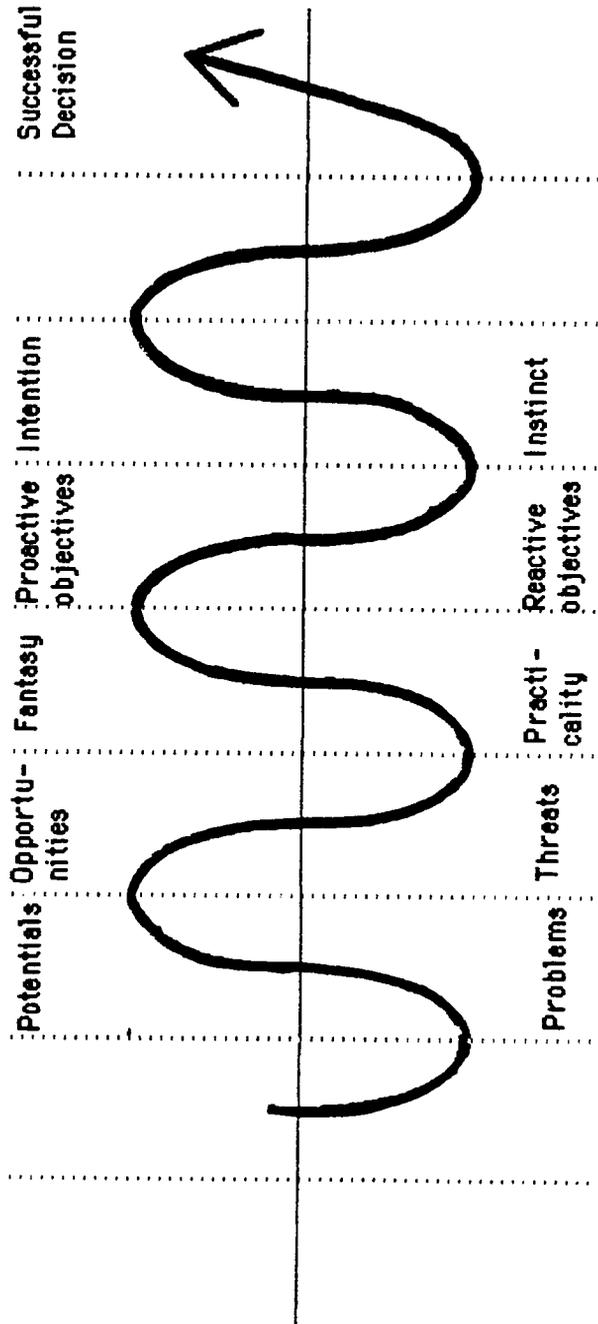


Figure 3.1. Eckbo's approach to creative decision-making. Eckbo suggests that creative design is an ongoing process that balances opposing notions to arrive at a successful decision.

fantasy and practicality? Are they mutually exclusive or correlated? Why should creative design be limited to a world in which no two phenomena are exactly alike? Where does order or pattern fit in the world of design?

Slowly in the last three decades, several emerging trends have raised interest in and the significance of adopting clearly defined processes of design and establishing valid criteria for their effectiveness. Among these emerging trends are the "environmental movement" that included the insistence of many citizen groups on public participation. Also, there are several legislative and judicial decisions in Western countries which require impact analyses for certain projects. The enormous scale of some of these projects underlines the urgency for sophistication and systematization of the process of landscape planning.

In brief, landscape planning and development decisions were suddenly put under the spotlight. It became essential for landscape planners, as well as other designers, to develop methods of decision-making which were defensible, communicable, capable of reliable predictions, and able to deal with complexity (6).

Common to all of the planning methods, which have been articulated, is a component for setting objectives. All landscape planning models show that the initial steps of the process involve objectives inputs referred to occasionally as "aims", "goals", "purposes", "criteria", "targets", etc. Initially, setting objectives was considered a step in the landscape planning process that involved primarily a deductive reasoning activity, usually starting with the conception of various alternative schemes or solutions to a given piece of land. McHarg's methodical application of the old technique of map overlays to define the capability of land for various uses is a good example of what decision theorists call a technical decision-making process. McHarg's approach is characterized by a logical process that concluded, apparently unarguably, the best land use concept without any further need for investigating other alternatives. Nevertheless, it is believed that such an approach is useful only in situations where objectives are substantially agreed upon and clearly stated. In his own work, McHarg has an obvious bias to the natural environment. In other words, for him, the best solution

is achieved when a landscape planner adopts the objective of minimizing any intrusion on natural processes. Of course, McHarg was criticized for not addressing other objectives, and for not accounting for other constraints. Lyle, for one, believes that:

In practice, however, it is rare, especially when working with landscape issues at the larger scale, to find such clear agreement on goals. Usually, in fact, the planning effort is given its original impetus by sharp differences in purpose, and the whole process is enlivened by conflict from beginning to end (7).

Gradually, however, the development of several new towns both in Europe and the United States in the 1950's and 60's, and in the Middle East in the 1970's and 80's, have forced both planners and decision makers into some hard thinking about public objectives. For example, J. W. Rouse, the developer of the new town of Columbia, Maryland, introduced a much freer and hence a more comprehensive approach to setting objectives than the limited one implied by the technical decision-making process mentioned above. He assembled a team of experts from 15 fields, including architecture, economics, law, public administration, landscape planning, transportation, and anthropology. For several months they met as a "human planning commission" to discuss the goals and dynamics for that proposed town (8).

Such a non-directed approach to setting community goals and objectives proved to be very effective in that it began as if there were no objectives and then explored the perceived and estimated needs and wants of potential (but not actual) residents. There were no preconceived environmental patterns into which people would be molded. Rather, this was an attempt to build a town in response to a hypothetical community imagined by an inter-disciplinary team of experts (Fig. 3.2). Such an interesting approach begins with a set of objectives and ends with an evaluation. It is in contrast to the technical decision-making approach which starts with analysis of technical data and concludes with introducing a statement of objectives to the evaluation stage. While setting objectives in advance is a useful tool for organizing resources to achieve certain general goals, setting objectives in itself can never be a substitute for either technical knowledge or human judgement. Rather, it balances and combines the two. Although it may be possible to agree on general goals or specific objectives, they are still likely to be weighted quite differently by different groups of the community.

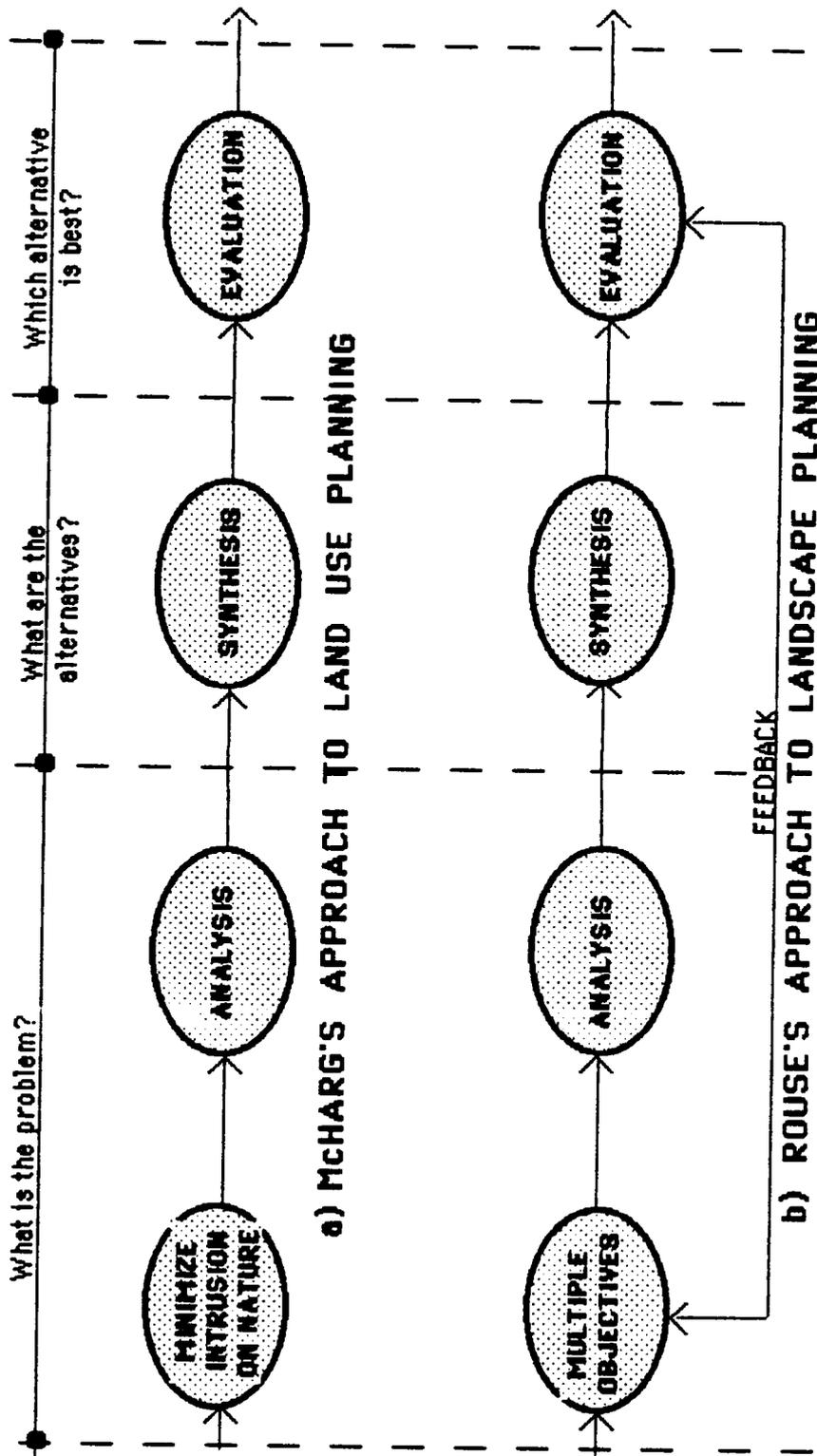


Figure 3.2 The technical decision-making approaches used by McHarg and as modified by Rouse

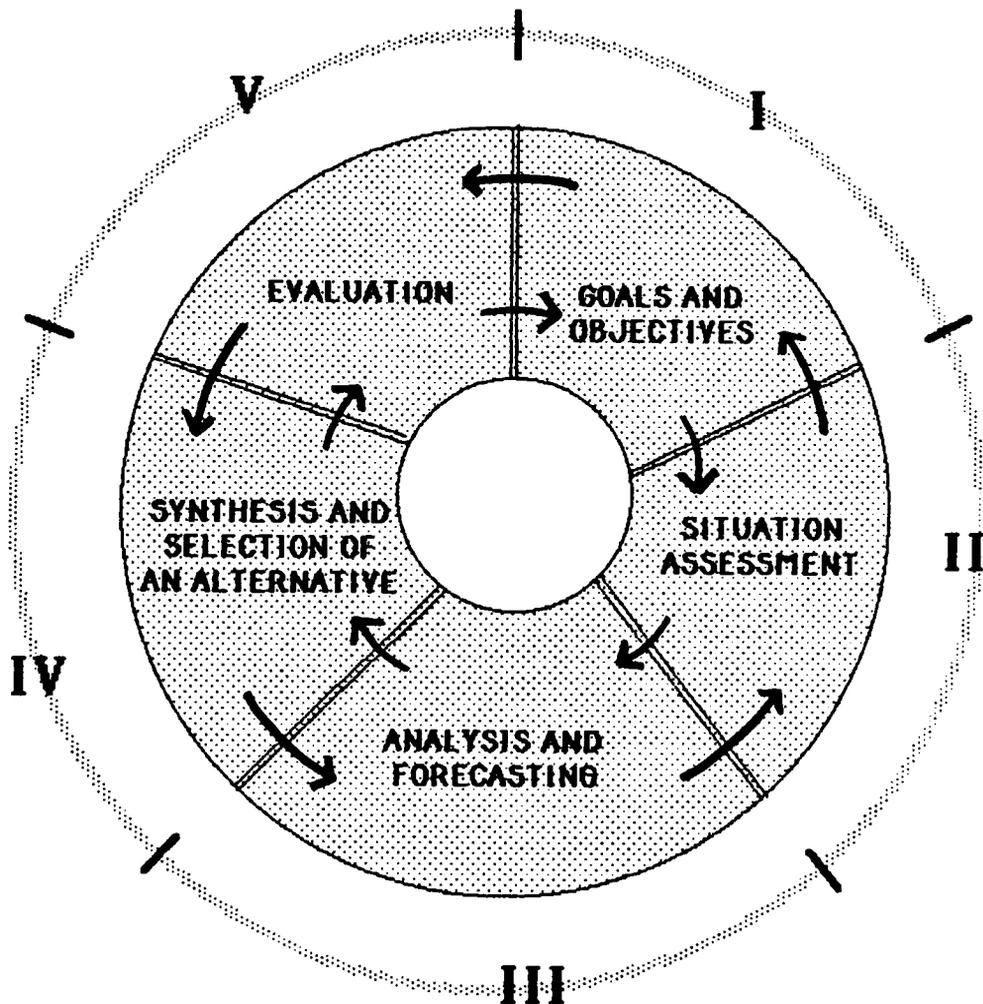
The above discussion displays the diversity of processes used in landscape planning. Eckbo's approach is characterized by iterative motions among many odds: practicality versus fantasy, problems versus potentials, instinct versus willed intention, threats versus opportunities, etc.

The technical decision-making approach reflects the rational paradigm of problem-solving. The fundamental steps of the rational paradigm are actually old ones which had universal application in most problem-solving situations. The rational paradigm goes back at least as far as John Dewey's theory of Pragmatism and is concerned with three basic questions:

- a. What is the problem? (Analysis)
- b. What are the alternatives? (Synthesis)
- c. Which alternative is best? (Evaluation)

The approach which has been used by Rouse is a modified version of the former. Within such an approach, objectives are developed prior to the three other steps. A fourth question is added before Dewey's questions, that is "what is the dream?" or "what is the most optimistic future?" It involves inputs of objectives. If prepared properly, these objectives may turn the remainder of the process into a highly motivating series of activities for all members of the community.

Applying the three above approaches has produced mixed results. A problem that they all share is related to their view of the process of problem-solving as a one-time act, static, and self-contained. In the last three decades many practitioners and planning theorists researched the sequence of activities included in these planning processes. Their efforts culminated in a highly dynamic model. Unlike earlier models, this planning model, as illustrated in Fig. 3.3, is iterative. It is, in a true sense, represented by the "circle of problem-solving" with a built-in feedback and possibly feedforward opportunities. To view the creative process in this way is to invest it with a dynamic quality which is inherent.



- I** WHAT IS THE DREAM?
- II** WHAT IS THE PROBLEM?
- III** WHAT IS THE NATURE OF THE PROBLEM?
- IV** WHAT ARE THE ALTERNATIVES AND WHICH ALTERNATIVE IS BETTER?
- V** HOW SUCCESSFUL HAVE WE BEEN?

Figure 3.3 An iterative model of the planning process with a built-in feedback and feedforward opportunities

3.2 Approaches to Setting Objectives

Setting public objectives should ideally be guided by a conscious and comprehensive process. Some scholars believe that landscape planning objectives may be viewed as formal hypotheses (9). Their assumed effects on humans' lives are waiting to be tested upon their implementation. But since an infinite number of public objectives exist, a logical question arises of where do we begin?

Churchman, for one, believes that:

The right theory for testing a given hypothesis seems trivial if compared to: how does the inquiring system select the right question to study (10)?

The following section will explore the different approaches to choosing from among a variety of objectives those which seem significant to their users or relevant to the context.

There are at least three general approaches to setting objectives. They are a) the chance approach, b) the affective approach, and c) the rational approach (11). The chance approach accepts the importance of the accidental in problem solving and in life in general. The affective approach stresses intuition, insight, feelings, and divergent thinking. A primary notion of this approach suggests that when uncluttered by intellectual entropy, peoples' intuitive power is significantly greater than that provided by mechanistic analytical tools (12). The hallmarks of the rational approach are objectivity, structured decision making, and systematic logical processes. Its basic themes are positivism, reductionism, and the cult of the expert and determinism (13). The rational approach is the only one among the three that landscape planners have adopted and have gradually attempted to improve. Because it represents the mainstream of the field of landscape planning, it will be discussed further. Beside these generic types, there are variations. Their success in certain situations is a function of cultural values, historical circumstances, and individual temperament.

Giles' approach for developing objectives for watersheds is a good example of the rational approach. It depends on pre-determined criteria and a comprehensive list of citizens' objectives. He concludes that "prescriptive statements can be made based on either computer simulations or op-

timization" (14). The same author states in another publication that "decision-making is a scientific paradigm that can be added to hypothesis testing, modeling, and parameter estimation". He gradually builds his argument to conclude that it is rational to model decisions, not only ecosystems.

He also suggests that:

...ultimately even the most basic research is devoted to improving decisions. By realizing this early, perhaps modelers can improve the transition from highly descriptive analytical models to more robust decision-aiding models (15).

On the whole, the rational approach to problem solving, among which setting objectives is but one step, has three generic problems. They include problems with: a) the process used, b) the inputs, and c) the analysis of data. The emphasis of this chapter, and indeed this dissertation, is on the first category of problems. The problems of inputs and of analysis will be examined in the next chapter.

Various planning, management, and development authors have suggested different steps for the processes of setting objectives. Zube, for example, sees the task of setting goals and objectives as the third phase in the evaluation process. To him, a six-phase process begins with a statement of certain societal values and ends with measurement. It is comprised of the following: a) values which the author defines as an "abstract frame of reference encompassing beliefs, thoughts, feelings, and attitudes that influence judgements, setting of goals, identification of needs, and discrimination among competing demands" (16); b) needs and problems; c) goals and objectives; d) environmental settings or domains; e) standards and criteria; and f) measurement. The six phases are arranged sequentially, with every one of them being affected by the ones preceding and succeeding them (Fig. 3.4).

Nadler indicates that five techniques of generating objectives exist. They are: brainstorming, brain writing, function analysis diagramming, nominal group technique, and purpose expansion (17).

Mali sees the activity of setting objectives as a three-phase process carried out in a sequence of steps (18). These three phases include: a) finding the objective, b) setting the objective and c) validating

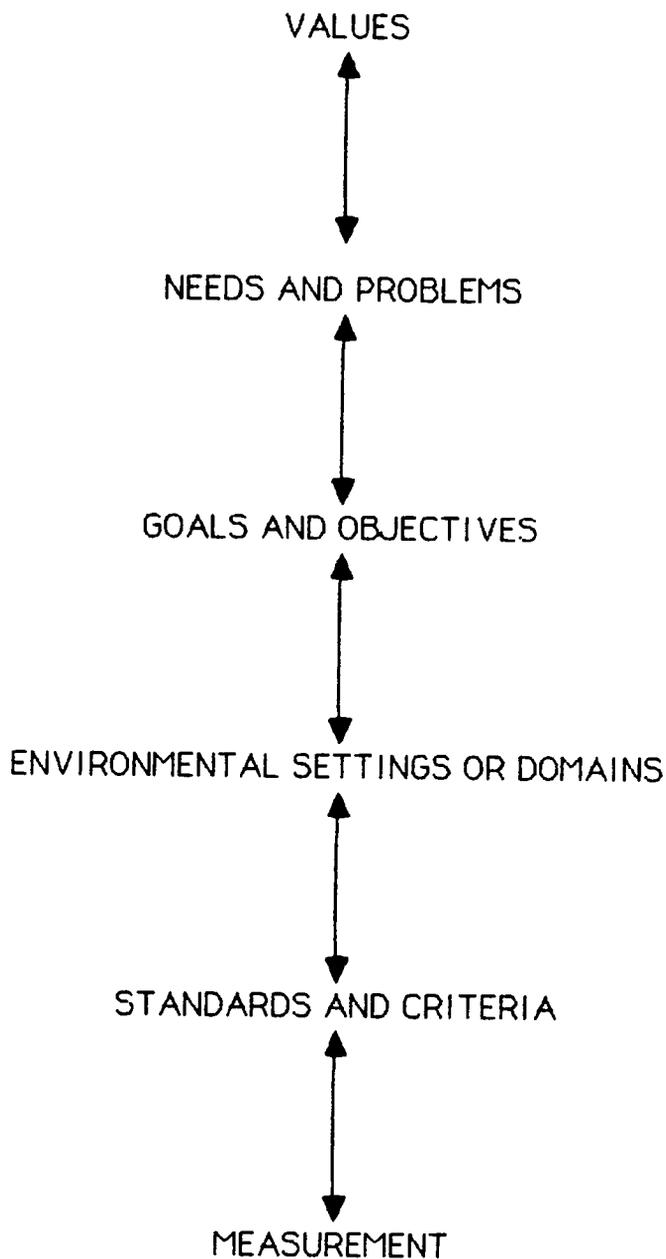


Figure 3.4 Zube's concept of goals and objectives in landscape evaluation
The task of setting goals and objectives may be seen as an intermediate phase in the evaluation process.

Source: Zube, Environmental Evaluation, 1984

the objective. He develops this model as a part of his conceptual framework of managing by objectives.

In a recent publication, and jointly with a professional staffer in a state wildlife agency, Giles presents a method for developing alternative objectives for hunting. The method furnishes a rational guide to wildlife agencies and produces an example of carefully ranked set of objectives. The method they used to produce that set includes three major steps. They are: listing, ranking, and assessing the efficiency curve for each objective (19).

Tec believes that setting objectives is a five-phase linear process. It includes determining, recording, sequencing, scheduling, and implementing targets (20).

Pathapati suggests that setting objectives could be seen as a systematic process within which several components may be identified (21). They include: a) determining objectives, b) developing the structure of the stated objectives, c) analyzing various objective relationships, d) weighing and/or ranking objectives and determining preferences, and c) developing criteria to evaluate objective achievement.

The above survey of processes suggests that there is a mixture of agreements and disagreements among the different authors. There seems to be no consensus in terms of the steps involved in the process of setting objectives. While they all agreed on determining objectives as the first step in the process, yet they differed in almost everything else (Table 2). However, it is suggested that the underlying concepts, common to all four processes, may be summarized as follows: a) determining, b) organizing, c) assessing, and d) managing objectives.

Table 2. Comparison of steps involved in the process of setting objectives according to various authors.

Author	Step 1	Step 2	Step 3	Step 4	Step 5
Mali, 1972	finding	setting	validating	--	--
Giles, 1979	listing	ranking	assessing	--	--
Tec, 1980	determining	recording	sequencing	scheduling	operationalizing
Pathapati, 1984	determining	structuring	analyzing	ranking	evaluating

3.3 Evaluating Approaches to Setting Objectives

Any planning approach or system is, by its nature, a procedural model. It serves as an ideal and is expected to have a normative framework. An epistemological question may arise: How does one know what is a good approach to setting objectives? Consequently what does one mean by good? A primary objective of this section is to suggest comprehensive criteria for evaluating both existing and proposed approaches to setting objectives.

One may criticize the procedures described above and other rational processes of setting objectives as being static in nature and inflexible in their procedure. One may also suggest that the evaluation of previous objective-setting exercises has not yet been synthesized into a coherent body to benefit future efforts. Most of these approaches have not produced a synthesis of objectives and therefore do not provide a basis for guided action or even a platform for useful dialogue among planners and theorists. Learning from these points of criticism, an attempt is made below to define the characteristics of a good approach.

A good approach in the context of a procedural model relates to: a) the quantity and quality of the final product of the system, i.e., the set of objectives; b) the quality of the operation, i.e., the effectiveness and/or the efficiency of the process; and c) the feedback received upon implementing the system. To base one's evaluation on a single component of these three would be unwise since each

of them involves practical or epistemological problems. For example, useful as it may be, validating a planning system by testing it in a real life situation is a risky approach since some impacts are irreversible and since some costs of that test are high or even prohibitive. Some researchers believe that the primary means for evaluating theoretical models is to refute the model (22). They argue that confidence in the model increases as it passes more and more severe tests (23).

Giles has discussed model validation as it relates to epistemology in general, and to feedback mechanisms in particular (24). He asserts that nine methods for validating models exist. They are: sensory, private, induction, contextual, authority, coherence, pragmatism, correspondence, and probability. In conclusion, Giles suggests that rather than relying on a single "perfect" validation method, one should utilize multiple methods--cyclically, simultaneously, or sequentially. He calls this validation method "heuristic convergence." It demonstrates a systems approach to knowledge, provides a continuing but satisfying uncertainty, and maintains an iterative, yet healthy state of insecurity. One may conclude, therefore, that a good approach to setting objectives is one which meets or comes closest to the trifold criteria listed below as output, process, and feedback-related.

3.3.1 Output-related criteria

Output-related criteria for evaluating an approach for setting objectives include:

- to facilitate translating general goals into specific objectives.
- to maximize the likelihood of arriving at operational objectives, even if these are merely a re-affirmation of existing or perceived objectives.
- to provide a framework for encompassing various types of objectives.
- to accommodate quantitative and qualitative dimensions of objectives.
- to provide suitable measures and standard vocabulary which facilitate stating and implementing objectives.

3.3.2 *Process-related criteria*

Process-related criteria for evaluating objectives include:

- to be relatively easy to learn, to use, and to monitor.
- to be clear in signaling the points at which critical decisions by the user are needed.
- to minimize the degree of friction among various users.
- to provide opportunity for input from an appropriate range of people in interests.
- to cause the minimum degree of uncertainty among various users when deciding on objectives.
- to be capable of receiving inputs from people at several levels.
- to allow an opportunity for fostering creativity and innovativeness.
- to maximize the effectiveness in utilizing all resources (time, money, people, physical resources, energy).

3.3.3 *Feedback-related criteria*

Feedback-related criteria for evaluating objectives include:

- to include an evaluation of past efforts at setting objectives.
- to include a record of progress.
- to accommodate variations in time, place, and users.
- to be adaptable enough to meet the changing and multiple values of humans.
- to be sensitive toward subtle as well as evident cultural differences.
- to maximize the probability of leading to attainable objectives.
- to suggest practical methods of how to get people to judge success or failure in reaching objectives.
- to be reliable.

3.4 Achieving a Proper Environment for Objectives

An organized set of objectives cannot be considered as a collection of individual objectives. According to the systems viewpoint, an organization is an open system interacting with its external environment and is heavily dependent on it for existence. Gannon writes, "To understand the functioning of an organization within the systems framework, one must pinpoint the specific external environmental forces that affect the subsystems and the interdependencies among them" (25).

Similarly, landscape planning objectives emerge within a certain context. They cannot become a subject of research before an environmental consciousness arises in a region and before citizens recognize that both planners and decision-makers need help in stating and clarifying such objectives. A few decades ago, there would have been general doubt that landscape planning objectives could or should be a legitimate field for detached research or for public concern.

Oversimplified as it may sound, there seem to be four stages in the evolution of landscape planning consciousness (Fig. 3.5).

1. In the first stage, landscape planning objectives are not expressed. Individuals try to satisfy their basic needs of food, water, and shelter; they strive to better their standard of living. Then, they begin grumbling about such things as poor or inadequate pastures, insufficient irrigation, erosion of their fertile lands, and pollution of their neighborhoods. People at this stage perceive unsatisfactory circumstances, yet their perceptions may lack any evaluative component. Their perceptions are usually lacking focus and are subject to influence from an immediate past experience and the present state of the perceiver. Consequently, people interested in productive grazing areas, efficient irrigation systems, conserved agriculture lands, and healthy human settlements are actually not aware that they are unconsciously pursuing landscape planning objectives.

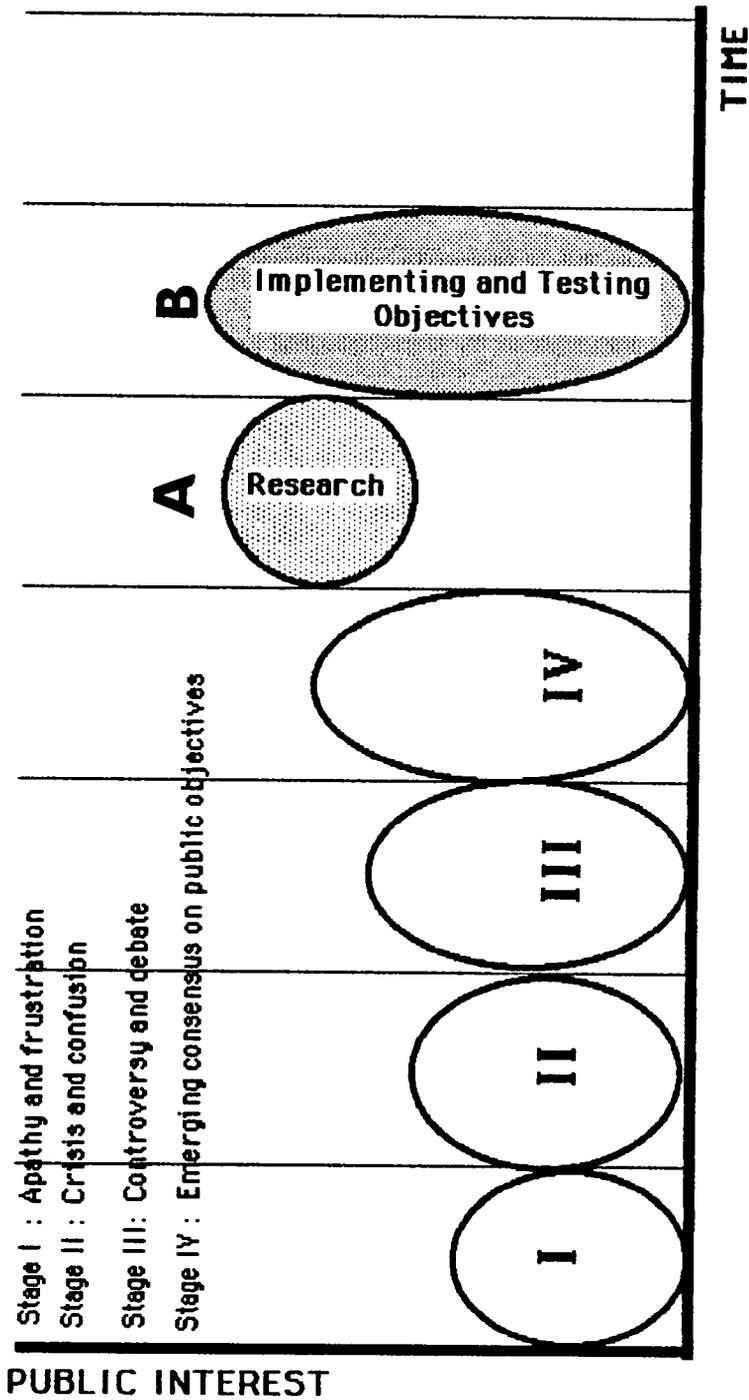


Figure 3.5. The four stages in the evolution of landscape planning consciousness. These are usually followed by two periods: (A) where research into objectives becomes essential, and (B) where the accepted objectives are pursued and tested.

2. The second stage is often, but not always, characterized by crises. When the pursuit of individual and community interests becomes frustrated on a large scale, it becomes clear that more is involved than a failure of an individual or a small group of people. In Egypt, for example, the national Law 48 of 1982 declared a limited period of one year for all water polluters to provide adequate treatment of their wastes or face certain penalties (26). This legislation came after Egypt encountered enormous health problems in various regions of the country, and after opposition parties and non-governmental groups applied much pressure on the central government.

During this stage of the process, problems, potentials, constraints, and needs tend initially to be expressed somewhat obscurely and to get clearer with time and effort. The society ultimately leaves this stage by having already accepted certain basic intentions or challenges. As it follows the course outlined by those intentions, the people will probably discover new territory in the line of their desired objectives.

3. In the third stage, people are concerned not only about whether the condition of their surrounding environment is acceptable or not, but also about what it produces and how well it is producing. Before the High Dam was built at Aswan, for example, the whole population of Upper Egypt lived under the annual threat of flood. They demanded and prayed for a solution. Since the completion of the project in 1971, however, there has been periodic dissatisfaction with its impacts on land erosion, soil fertility, fish production, levels of parasitic diseases, and other associated problems. The crisis of annual floods (and the auxiliary desire for more hydroelectric power) were necessary to make the construction of the High Dam a national objective for more than a decade. Nevertheless, it was the adverse impact of achieving the very same objective that has given rise to many other landscape planning objectives such as the national campaign to minimize land erosion caused by natural or human forces after the High Dam.

4. In the first three stages it is the experience of failure, frustration, confusion, and continuing but new crisis which results in the birth of general landscape consciousness. The fourth stage is one in which, after controversy and debate, some general acceptance of certain goals and objectives emerges and consensus is gained. In this stage, more controversy centers on the speed and the tactics to pursue the objective rather than on the objective itself. This is demonstrated, for example, by the adoption of Law 102 of 1983 which designated eight national parks and equivalent protected zones across Egypt. This may be regarded as a milestone symbolizing that the Egyptian people and their leadership had become environmentally conscious. Only at this point can one differentiate between a goal and objective and consequently, a planner is able to measure the accomplishment toward the people's overall goals.

Equally characteristic of the fourth stage is the recognition that pursuit of one type of objectives may contribute to or detract from another type of objectives. At this stage it becomes urgent to study the mutual interrelationship among different sets of objectives and between the total development of the region and the attainment of each objective. On the whole, each objective has a different impact on the development process. Therefore, development depends not only on the intensity of efforts in pursuit of objectives, but also on the combination of objectives which is selected for pursuit. Only at this point does research into objectives become practical because some consensus is beginning to emerge about the objectives which are desired. Indeed, such research becomes essential because choices have to be made about priorities and combinations of objectives and the manner in which to pursue them. Research into objectives, as conceived here, would not provide the answers to all landscape planning issues, but could at least provide what is believed to be foremost activity in all planning, namely, to state clear objectives that are useful in decision-making.

The intent of this dissertation is to investigate thoroughly this fourth stage and examine its link to the overall landscape planning process.

3.5 Existing Approaches to Determining Objectives

No society has the time, energy, or resources to pursue all landscape planning objectives that seem desirable. Thus, the objectives must be assessed and ultimately structured into a priority list. High priority objectives are those valued most by the society (See Chapter 1.6.2). They should receive the time and attention befitting their significance before pursuing other landscape objectives of lesser value. In addition, it is believed that by achieving certain significant objectives, other closely associated ones are simultaneously achieved without additional overt action or direct expenditures. Developing priority objectives involves determining how each specific objective could promote desirable conditions, end-states, or circumstances of life that seem important to the society, and at what cost.

A first step in studying this topic is to survey common approaches which are currently in use for determining the content of landscape planning objectives lists. It is likely to be useful to contrast those approaches with the one that is proposed by this dissertation.

3.5.1 The problem-focused approach

One way to develop landscape planning objectives is the "Problem-Focused Approach" described in Chapter 2.1.3 and applied in Chapter Four. The approach hinges upon charging the responsible governmental officials and landscape managers with the task of identifying their subsystem's weaknesses and strengths and then translating them into specific objectives. However, humans are not usually motivated to point out their weaknesses in an honest and unbiased manner. People normally assume that doing so focuses attention on themselves and suggests that they may be responsible for the problems, or at least, negligent in solving them. In brief, government bureaucrats may not be the best ones to assess their own subsystems' weaknesses and consequently to determine what objectives should be recognized as significant to these subsystems. This potential bias is

rooted in the obvious vested interest that such officials have and because of what they may perceive as the wishes of their bosses and the aspirations of the existing leadership. The "Problem-Focused Approach" also has been criticized on the grounds that it is limited to only one type of landscape planning objectives, i.e., reactive objectives. To be comprehensive, therefore, Lynch has suggested that the produced list should always be supplemented by an additional list of potentials and opportunities (27).

3.5.2 The inductive approach

A second way to develop landscape planning objectives is the one called herein the "Inductive Approach." It is illustrated in Chapter Five. This common approach relies on landscape planners to gather (from various sources, similar projects, and from previous studies) relevant public objectives. In addition, they detect hidden objectives, sharpen fuzzy ones, and prepare documents supporting the landscape planning projects and policies. Typically, landscape planners who perform these tasks neither have the comprehensive technical expertise nor the authority to make the significant choices involved in the process. Consequently, the typical output of this exercise is an exhaustive document with an emphasis on ensuring that nothing related is omitted rather than on attempting to distinguish the most relevant objectives from a mass of less relevant and irrelevant ones. Such a product only serves to perpetuate what Ackoff considers as the existing state of affairs regarding most lists of public objectives provided to decision makers at all levels: they are deluged with irrelevant or peripheral objectives. At the same time, political leaders and managers are unable to find specific and ranked objectives crucial to their societies and regions (28).

One should keep in mind that lists of objectives alone are unweighted. They only provide a collection without hierarchical structure. Values are attached later by society. It is one of the planners' jobs to determine all kinds of competing values and assist in their reconciliation. Accordingly, public participation in the process of stating landscape planning objectives is rather significant because it provides a forum for the society and their leaders to articulate these values and relate them

to the formulated objectives. Landscape planning problems cut across all kinds of human activities, often spill over territorial, national, and geographic boundaries, affect all ecosystems of the Earth, and require treatment involving all aspects of human knowledge. Because of this wide scope, nobody should be indifferent to questions of who is to plan the landscape, or how landscape planning objectives are developed.

A primary advantage of opening widely the door for citizens involvement in developing landscape objectives is to generate useful dialogue. This can be a valuable input for planners, yet it may raise false hopes among citizens instead of helping them to deal with impending changes.

A good example of this approach was included in a publication entitled "The Crests: A Guidance Document" by Giles (29). The author accumulated a very long list of objectives for a large mining region in Wise County, Virginia. In conclusion, he acknowledges that: a) the odds of having similar lists in nearly any other situation are very small because of the extensive time and energy required in compiling them, and b) systematizing and perhaps computerizing the task of formulating and setting objectives is an urgent need among planners in order to reduce time and energy costs.

3.5.3 The deductive approach

Hackett suggests yet a third approach which is carried out in two sequential phases. He argues that:

The landscape planner working at the regional level will in all probability be faced with the need to make preliminary recommendations before proceeding to the final proposals. In such an event, a reconnaissance survey giving a generalized picture of the landscape, its problems and potentials, will be appropriate. There are considerable advantages in carrying this out and mapping it in such a way that it can form a framework for the full survey in depth at a later time (30).

The initial output of such an effort would include a preliminary set of objectives. This set has many virtues. It assumes some knowledge about the whole situation and the desired future. Such assumptions, even if initially vague, provide a base against which the optimum objectives can be added when a relatively thorough coverage of the region is conducted. The chief advantage of

Hackett's approach is that it is fairly economical. Its deductive sequence from the general to the particular reduces the chances of duplication of effort. It also helps in setting up a framework of interaction between experts and representatives of the public who may contribute jointly to the task of developing landscape planning objectives. The technical decision-making approach developed by Rouse is analogous (Chapter 3.1).

The major drawback of this approach lies in the absence of an explicit initial role for the people and their political leaders. The approach, as stated by Hackett, may suggest that the landscape planner should be the sole expert deciding and outlining the framework of public objectives.

Contrary to these approaches, the Landscape Planning Objectives System proposed herein and referred to hereafter as (LAPOS) incorporates both participatory and professional processes. It builds on the strength of the deductive approach and deals with its weakness. LAPOS will be described in detail in Chapter Four.

3.6 The Search for the Premises of LAPOS

Throughout the reviewed literature the concept of landscape quality was often mentioned. This can be read as "how good is the landscape"? Improvement of the landscape, restoration to quality, and provision of places of high quality are all desirable ends. However, the demands of systems thinking require another question be asked: Why? The pressure is on to reach the ultimate objective. Why are these things really being done? What should all of this work and investment really do? To produce a high quality landscape is a good but incomplete answer.

In a poetic statement, Giles has answered the above questions more comprehensively than most. He asserts:

The real answer is to create spaces in which people may achieve their full potentials, discover their highest humanity. This will differ for each person, of course, but the concept of environment is of a

total life space, a place where people can see far, drink deeply, breath freely, think quietly, smell varieties, and achieve other sensory limits (32).

He further suggests that the landscape (environment) is people as well as things. It encompasses the seen and the unseen as well as the past and the expectation.

In brief, when people speak of improving their regional landscape quality, it is theoretically sound and humanistically progressive to conceive of that effort as an attempt to expand the opportunity space of people (or at least prevent it from shrinking).

To stop any further landscape deterioration in the arid Middle East and to bring about significant improvements over the current situation will require very careful planning. But careful planning cannot be performed adequately without detailed examination of the desirable future for which people are striving, and of the means that are available or will have to be created in order to achieve the desired state. It is also believed that whoever is undertaking the overwhelming task of planning the landscape of such ecologically sensitive regions will need the support of an extensive objectives system.

Before describing the proposed LAPOS or its subsystems, three caveats are in order. First, the various components to be described need not be developed as computerized subsystems, although they will most likely be in the near future. The term "system" is used here to describe a conscious, continual, and formal set of activities that provide decision-related output. Second, no inference should be drawn that it is feasible for a single project team to develop the total system implied here. Third, developing this comprehensive system is both a costly and complex operation. The most important purpose of the system is to gather objectives systematically, to have them aggregated; evaluated; and synthesized by trained people, and to ensure that they are distributed to planners and decision makers who can make use of them. If this can be done in a parsimonious fashion to ensure that the great amount of redundant and irrelevant objectives already available is not merely expanded, the benefit can far outweigh the cost of such an operation.

Other beneficial by-products may also be gained from applying such a system. These include: a) clarifying people's thinking; b) providing a basis for actions; c) assessing progress; d) creating a basis for policy analysis, change, or diversion; e) breaking down the required activity into chunks that can be tackled on successive dates; and f) presenting a general picture of the overall situation. Consequently, the moves that planners and political leaders make during the process will not be solely the result of the pressures of the moment, but will be in keeping with much more fundamental decisions that the whole society has made. These may involve issues as: who the people are and what they want to do with their regional landscapes.

3.7 Summary

Developing better ways of setting objectives is a prerequisite to enhancing the quality of decision making in landscape planning. Only a few people are mentally capable of participating in the process of formulating a comprehensive set of objectives because of the complexity of the task.

Landscape planners did not seriously explore their planning processes until the mid-twentieth century. Public and judicial pressures demanded defensible, communicable, and reliable decision making procedures from landscape planners and that ended the era of oversimplification in this field. Most of the efforts during the 1960's went into systematizing what is known as the rational planning process. The basic sequence of that process is standard. It is comprised of four components: inventory, analysis, synthesis, and evaluation. The variations of this basic process were surveyed. An iterative model is preferred since it accommodates a built-in feedback and possible feedforward opportunities.

Five approaches to setting objectives were examined and compared. The survey showed some agreements and some disagreements among the various authors. Conceptually, however, there are four phases that are common to all alternative approaches. They are: determining, organizing, as-

sessing, and managing objectives. Comprehensive criteria for evaluating both existing and proposed approaches to setting objectives were suggested. They include the following triad: a) output-related criteria, b) process-related criteria, and c) feedback-related criteria.

Three approaches to determining landscape planning objectives exist. They are the Problem-Focused, Inductive, and Deductive Approaches. Each of these approaches has certain drawbacks and advantages.

Footnotes

1. In his book, Scientific Method: Optimizing Applied Research Decisions (New York: Wiley, 1962), Ackoff presented the following definitions of these two key words: "A technique is a way or course of action for accomplishing a scientific or professional objective. Techniques are ways of using tools. On the other hand, a method is the way techniques are selected for use in planning and analysis. Methods provide the rules of choice while techniques are the choices themselves."
2. C. W. Churchman, The Systems Approach and Its Enemies (New York, Basic Book, 1979), p. 31.
3. J. Simonds, Landscape Architecture (New York: F. W. Dodge, 1961), p. 97.
4. J. T. Lyle, Design for Human Ecosystems, (New York: Van Nostrand 1985), p. 126.
5. G. Eckbo, The Landscape We See (New York: McGraw Hill, 1969), p. 54.
6. Lyle, 1985, p. 127.
7. Ibid, p. 131.
8. W. Goodman and E. Freund (Eds.), Principles and Practice of Urban Planning (Washington, D.C., The International City Managers' Association, 1968), p. 141.
9. R. Chenoweth and S. Weidemann, "Teaching Research in Landscape Architecture", Proceedings of the 1983 Conference of the Council of Educators on Landscape Architecture (Urbana, Illinois, 1983), pp. 111-125.
10. C. W. Churchman, The Systems Approach and Its Enemies (New York, Basic Books, 1979), p. 33.
11. G. Nadler, The Planning and Design Approach (New York: John Wiley, 1981), p. 28.
12. R. F. Wells, "Application of the Principle of Minimization of Entropy in the Achievement of Steady-State Solutions for Dynamic Systems" (Ph.D. Dissertation, VPI&SU, Blacksburg, Va., 1974), p. 32.
13. R. H. Giles, Jr., "CAPS - Wildlife: Introduction and Future Potentials", Note #1, 1983, Dept. of Fisheries and Wildlife, VPI&SU, Blacksburg, Va.
14. R. H. Giles, Jr., "Modeling Decisions or Ecological Systems?", in Environmental Biomonitoring, Assessment, Prediction, and Management-Certain Case Studies and Related Quantitative Issues, ed. J. Cairns, Jr. et al., (Fairland, MD: International Co-op Publishing, 1979), pp. 147-150.
15. Ibid.,
16. E. H. Zube, Environmental Evaluation: Perception and Public Policy (Cambridge: Cambridge University Press, 1984).
17. Nadler, 1981, p. 320.
18. P. Mali, Managing by Objectives (New York: Wiley-Interscience, 1972), p. 12.
19. L. Tec, Targets: How to Set Goals for Yourself and Reach Them (New York: Harper & Row, 1980), p. 64.

20. S. S. Phathapati, "An Interactive Goal Formulation Methodology to Aid the Strategic Planning Process", (Ph.D. dissertation, VPI&SU, Blacksburg, VA, 1984), p. 29.
21. R. H. Giles, Jr. and J. M. Lee, Jr. 1982. "When to Hunt Eastern Gray Squirrels" in Duerr, W. A., D. E. Tee-guarden, N. B. Christiansen, and S. Guttenberg (eds.), Forest Resource Management: Decision-Making Principles and Cases (O.S.U. Bookstores, Inc., Corvallis, Oregon), pp. 583-596.
22. S. D. Schemnitz (Ed), Wildlife Management Techniques Manual, 4th Edition, (Washington, D.C.: The Wildlife Society, 1980), pp. 214-220.
23. Ibid.
24. R. H. Giles, Jr., Epistemological Bases (Class Notes, Techniques of Wildlife Management, Blacksburg, Va., VPI&SU, 1986).
25. M. J. Gannon, Management: An Integrated Framework (Boston: Little, Brown and Co., 1982), p. 38.
26. Council of Ministers', Memorandum to the Prime Minister of Egypt from the Minister of State for Administrative Development, Cairo November 13, 1983.
27. K. Lynch, Site Planning, 2nd Edition, (Cambridge: MIT Press, 1972), p. 276.
28. R. L. Ackoff, "Management Misinformation Systems", Management Science, Dec. 1967, Vol. 14, No. 4, pp. 147-156.
29. R. H. Giles, Jr., "The Crests: A Guidance Document", (Blacksburg, VPI & SU, 1982), pp. 160-172.
30. B. Hackett, Landscape Planning: An Introduction to Theory and Practice, (Newcastle upon Tyne, U.K.:Ornell Press, 1971), p. 19.

Chapter Four: From Problems to Objectives: Challenges of Developing The Arid Middle East

Surveying the problems of the arid Middle East may be a useful step towards formulating landscape planning objectives for that region. A list of identified problems of a region could, systematically, be transformed into a list of reactive landscape planning objectives. And since landscape planning utilizes both reactive and proactive means of formulating objectives (See Chapter 2.1.3), a comprehensive set of objectives may be achieved after potentials and problems are prepared and used simultaneously to formulate the list. Such a list represents an important tool in the landscape planning process. This chapter uses the "Problem-Focused Approach," suggested by Lynch (See Chapter 3.5.1), to investigate the typical problems and challenges facing landscape planners in developing the arid Middle East.

The conditions of the arid regions of most Third World nations are alarming. The recent drought in the Eastern Horn of Africa is outstanding evidence of the state of affairs. After many decades of colonial exploitation, followed by several decades of social unrest and occasional regional wars, the magnitude of the disasters that these nations may be facing is terrifying to contemplate (1). This situation has resulted from years of accumulating problems. Surveying and then controlling such problems is probably a prerequisite to any future development or, at least, it needs to be a parallel effort. The following sections use sector-based classification. The six sectors classify problems associated with the six most common land-uses in the arid Middle East. Based on this classification of problems, relevant objectives are formulated for each group.

4.1 Problems of Pastoralism

Modern advances in range management and animal breeding have brought both advantages and disadvantages to the people of the deserts of the Middle East. The advantages lie in the opportunity for the material enrichment of people through use of lands too arid for farm or forest. The disadvantages materialize in the adverse impact of overgrazing on many areas of that region. This primary problem and many others are outlined in the following survey.

4.1.1 Low productivity of livestock

Animal husbandry in arid and semi-arid regions is vital. As a whole, these regions contain over one-half of the world's stock of cattle, more than one-third of its sheep, and two-thirds of its goats. Unfortunately though, the whole sector is extremely vulnerable because of climatic conditions. Also, in many areas it is noticeably inefficient. Livestock productivity in non-industrialized countries is only 10 to 20 percent of that obtained in modern animal husbandry (2).

Relevant Objective:

- To maximize the net discounted benefits from livestock production in the region.

4.1.2 Extreme fluctuation of the quantity and the quality of suitable rangelands

Water resources are uncertain and intermittent in arid and semi-arid regions. Therefore, large areas of rangeland can be used only during the short rainy season. For the rest of the year, the herds must be withdrawn to areas where there is a moist climate. This requires moving them across many different pastoral systems. Diversity in range quality is normally caused by climatic and geological differences and variations in the landscape configuration. Due to this diversity, the food that dif-

ferent pastoral systems produce for livestock tends to vary significantly. Also, the food provided by the same pasture may be plentiful and rich in the rainy season, while suddenly becoming insufficient and of a low nutritive value throughout the long dry months.

Relevant Objectives:

- To maximize the predictability of water resources.
- To stabilize supplies of food and water available to livestock over long periods.
- To improve the transportation system for livestock.

4.1.3 General disturbance of the delicate balances of rangelands

Moving among areas and adjusting human and animal densities is a sensible response by pastoralists to arid conditions. In the Mediterranean coastal deserts of Egypt, for example, the typical mobility of pastoralists and herds has a seasonal rhythm. Unfortunately though, these traditional forms of pastoralism have been diminishing everywhere during recent decades. Consequently, the delicate balance achieved or sought by this mobility has also been diminishing. The overall deterioration of rangelands in arid and semi-arid regions clearly demonstrates this problem.

Relevant Objective:

- To maintain a dynamic rational system of rotating herds across the region based on reliable climatic information.

4.1.4 Increasing conflict and competition between crop production and animal husbandry

Overpopulation of people and animals in the arid and semi-arid environment is a main cause of the difficulties facing pastoralism. The demographic growth, which characterizes most countries of the

arid Middle East, has led to over-exploitation of natural resources as demonstrated in transforming many pastoral lands into farms. Historically, the semi-arid belt was the area in which the surplus pastoral population was absorbed and settled. Recently though, this belt has become a ground of conflicts and competition among various groups including: a) the new sedentary population, b) the old pastoral societies, and c) the traditional farming communities, which sought to extend their activities and grow not only subsistence crops, but also various cash crops. This race for the use of land has caused the rangeland areas since the 1950's to recede as new agricultural holdings expanded. As summarized by a UNESCO study:

The pastoralists, now isolated in the least accessible regions, are also finding that the pastures where they used to go in the dry season and where they could find water and forage, are now gradually being lost (3).

Relevant Objectives:

- To plan and control the semi-arid belts based on valid studies of their carrying capacity.
- To establish crop and pasture land suitability maps.

4.1.5 The lack of concern of governments for the pastoral way of life

Among the many factors that could explain the crises of pastoralists in most desert countries, the most general are "the under equipment and under administration of the arid zones, the peripheral nature of their economy and, finally the marginalization of their population" (4). This factor may be observed in the case of the New Valley; a desert province in Egypt. In 1961, the New Valley was, for the first time in the long history of Egypt, officially declared as an autonomous province with an appointed governor. Further, the first team of governmental representatives arrived to Al-Kharga, then the largest settlement in that province, on October 3, 1959 (5). This very late concern and/or action over the area, which represents 46% of the total area of Egypt, is typical to what happens to arid regions in other neighboring countries. It is also believed that the small size of the population is responsible, in most cases, for the apparent little influence such regions have

had on the decisions of central governments. In this case, the estimated population of the "New Valley" was cited in 1985 to be 112,000 of a total population of 46 million Egyptians.

Relevant Objective:

- To achieve an appropriate representation of pastoralism in the national economy, regional administration, and political decision making

4.1.6 The hostility of modern governments to the mobility of pastoralists

A consistent objective of all governments of the arid Middle East seems to be to settle their population. This policy presumably has been adopted to ensure and facilitate law and order, to plan accurately, and to manage effectively in all regions. Mobility, however, remains the most suitable adaptation to the sparse, dynamic, and short-lived resources of the rangeland. These opposing objectives of the modern state (by virtue of its nature) and of the Bedouin population (by virtue of its logical response) cause tensions and sometimes clashes in most countries of the arid Middle East. With very few exceptions, governments have adopted a hostile position towards the mobility of pastoralists. This uniformity of position occurs, to everyone's surprise, regardless of the diversity of the political systems among these countries. A UNESCO study describes the situation in two significantly different Arab countries:

The hostility is found under all regimes and the aim, sometimes explicitly stated as in Syria, is to do away with nomadism and its attendant social organization. Even governments are stemming from the Bedouin civilization, as in Jordan and Saudi Arabia, encouraging all their peoples to settle and do not oppose the encroachment by various forms of speculative agriculture on traditionally nomadic lands (6).

Relevant Objectives:

- To minimize the encroachment of various forms of speculative agricultural, urban, and industrial land use on quality livestock rangelands.
- To support the nomadic life of the people which contributes to the traditional landscape quality of the region.

4.1.7 The inhibiting conditions of the economic system of pastoralism

On the whole, pastoralism yields the least return and involves greater risk than most other agriculturally-related activities. In addition, there are other difficulties involved. They include such factors as the great distances between rangelands and the centers of consumption, the control of government or private intermediaries on the profit, and the marginal position and peripheral nature of this sector's contribution to national economies.

Relevant Objective:

- To develop an efficient transportation and communication system with appropriate emphasis on providing convenient access between rangelands and marketing opportunities.

4.2 Problems of Irrigated Agriculture

The story of agriculture in the arid Middle East during the last four decades is a mixture of failure and success. The lack and/or ineffectiveness of land-use policies has led to the loss of some potentially productive land to other uses as observed in the case of Greater Cairo, Egypt; Tripoli, Libya; and Medina, Saudi Arabia. On the other hand, a rapid growth in desert reclamation has occurred, mostly induced by government policies and government involvement in agriculture and irrigation projects.

Many of the problems of agriculture stem from proposing irrigation as a panacea to arid and semi-arid areas. Irrigation has been often proposed without adequate studies of how much such a venture will actually cost, and what specific precautions and expertise will be required. The Aswan High Dam is probably one of the most publicized projects that demonstrates this phenomenon. The serious difficulties of the project relate not to the detection and delivery of water, but rather to the secondary effects of irrigation on the land.

On the whole, agriculture in arid and semi-arid regions faces severe problems of water economy because the salinity of the soil causes osmotic withdrawal of water from plants, and because hot, dry atmospheric conditions cause excessive loss of water through evaporation and transpiration. The following problems of irrigated agriculture are considered especially important to the arid Middle East.

4.2.1 Irregularity of water supply

A UNESCO study of the Moroccan countryside concludes that if water was distributed evenly throughout the 12 months, instead of in the form of sporadic floods, the same amount of water would support three times as many people as the current stream flows (7). The logical solution for the irregularity of water resources has been to build dams to accumulate the runoff water. Unfortunately though, such a solution triggers the typical problems of rapid silting, high loss of water by evaporation, and the increase of water salinity.

Relevant Objectives:

- To promote and ensure the application of ecologically sound standards of irrigation for cropland and pastures.
- To maintain a balance between productive capacity of water reservoirs and water utilization.
- To maximize the net discounted value of water over reasonable investment periods.

4.2.2 Mismanagement of water resources

Hydrology studies of the arid Middle East indicate that not only lack of water, but also careless use are dimensions of the difficulty. Finding the right use and location for a limited quantity of water is a challenging riddle of optimization. Both Egypt and Sudan provide examples of this mismanagement of water resources. It is estimated that 50% of irrigation water is lost by infiltration and

evaporation before it reaches cultivated plants (8). Along with a high ratio of loss are additional problems such as increased waterlogging of the soil and increased salt-laden waters produced after leaching the salinized land.

Relevant Objective:

- To minimize inefficiencies in water uses and to minimize water infiltration and evaporation from the land.

4.2.3 Salinization of soils

The problem of salinization is globally responsible for putting millions of acres of already reclaimed desert land out of production (9). Heavy irrigation over long periods has increased salinity in many areas of the Middle East, further diminishing the land's crop-carrying potential. The proportion of zones which are vulnerable to damage through salinization is significantly high in the Middle Eastern countries. These zones represent 50% of the total irrigable area in Iraq and Syria, and 30% in Egypt (10). The layer of salt that has accumulated on the soil has reached such quantities that it has made some land unsuitable for most crops.

Relevant Objectives:

- To minimize the disturbance of areas with soils of high salinity potential.
- To minimize the introduction of exotic plants that require heavy irrigation.
- To maximize the cost effective reclamation of salinized soils.

4.2.4 Problems of soils

Cultivating the soils of the arid and semi-arid Middle East requires a great deal of skill and knowledge. It is often considered a very uncertain operation due to numerous drawbacks of the desert

soils. These soils are rarely well balanced (in terms of texture and mineral content), are low in organic matter, and are characterized by high density and structural instability. In certain cases, the factor which limits production is not the lack of water but rather the nature of the soil to be irrigated. In addition, ploughing and baring the topsoils of the delicate ecosystems of the arid lands have caused widespread erosion.

Relevant Objective:

- To maximize sound practices of crop production.

4.2.5 Economic evaluation of agricultural projects

A general tendency among governments of the Middle East has been to pursue horizontal expansion of irrigated land. Critics consider such a bias in planning and developing the agricultural sector as wasteful (11). They suggest that developments like the Dujaila project in southern Iraq and the Liberation Province in northwestern Egypt were both excessively optimistic and politically motivated by the emotional slogan, "greening the desert". A UNESCO study states:

The bias which the governments of the countries concerned (as well as the countries aiding them in various ways) seem to have in favor of large projects is often more connected with prestige at home and abroad than the result of detailed analysis of the economic effectiveness of the project (12).

The issue of the real economic value of these developments is not a simple one to analyze. Due to an essential need to install a system of drainage with almost every new irrigation work, developing these new agricultural lands inevitably will be very costly. In many of these cases, the responsible governments took land out of agricultural production for urban and industrial expansion and spent millions of dollars in reclamation and irrigation projects to bring new desert land into production. It is an odd situation which complicates the economic evaluation of these projects and other development projects as well.

Relevant Objective:

- To minimize the total long-term costs (both environmentally and monetary) of horizontal expansion of agriculture both on local and regional levels.

4.2.6 Associated health problems

Irrigation dams in the arid lands may have the negative effects of supplying new habitats for the intermediate stages of parasites. Bilharziasis and onchocerciasis are the most common of vector-transmitted diseases in the arid Middle East which are correlated to irrigation projects. They affect a large number of the people of Egypt and Iraq and are also common in some parts of Saudi Arabia and Sudan.

Relevant Objectives:

- To achieve the earliest possible diagnosis of Bilharziasis and onchocerciasis.
- To minimize disease susceptibility of all age classes and sexes.
- To minimize areas within water development projects that are beneficial to human and livestock parasite life stages.

4.3 Problems of Rain-fed Agriculture

Rain-fed agriculture is defined as farming without supplementing rainfall with any additional water. The problems of this type of cultivation are irregularity and short duration of rainy seasons.

4.3.1 Irregularity of rain

The high inter-annual variability may be illustrated by examining the case of Kairouan, in the Tunisian steppes where 545 mm of rain were recorded in 1934 in contrast to 54.6 mm in 1945 (13). This irregularity makes regions dependent on rain-fed agriculture vulnerable and insecure. Insecurity in the food supply is more serious in the Middle East than other regions because it affects countries where the population is rapidly growing. For example, Kuwait and Qatar are growing at an average rate of 4% per year; Libya, Jordan, Saudi Arabia, Syria at 3.5-4%; Algeria and Iraq at 3-3.5%; and Egypt at 2.5-3%. On the whole, the population growth rate from 1955 to 1970 in many Arab countries was 3.6 percent as contrasted to zero percent in some European countries such as West Germany and France (14).

Relevant Objectives:

- To establish a comprehensive geographic information system which includes drought probabilities.
- To rehabilitate natural aquifers and naturally vegetated areas.
- To encourage and support family planning efforts in all arid and semi-arid regions.

4.3.2 Soil erosion

Irregularity of precipitation in arid and semi-arid lands has several adverse impacts on the soils. The sudden onset of a storm, for example, could result in considerable run-off. Such an excessive run-off often causes soil erosion. Particularly when soils are not sufficiently permeable, run-off water carries away the upper horizons of most light soils. Furthermore, short, intensive rainfall usually results in selective separation of the grains of the soil, exacerbating the damage caused by wind and water erosion.

Relevant Objectives:

- To establish and maintain a comprehensive meteorological information system of all climatic and soil factors of the regional ecosystem.
- To maximize the use of land areas according to climate and soil models.

4.3.3 Cessation of rotation system

A rotation system alternates crops and fallow in a several year cycle. This system, which has been a traditional way of dry farming in the arid Middle East, is gradually vanishing. Regardless of how advantageous the system is for the soils, the current population increase and the spread of cash cropping is making the practice of fallowing a thing of the past.

Relevant Objective:

- To promote and ensure traditional ways of dry farming.

4.3.4 Intrusion on grazing lands

The cessation of fallowing has resulted in unfertilized soils becoming exhausted of nutrients, land erosion increasing, and ultimately land productivity being reduced. The continuing need of peasants to earn money has induced them to extend their activities to regions with even greater risks, namely rangelands. In Iraq, Jordan, eastern Morocco, and northwestern coast of Egypt, the extension of rain-fed cultivated areas has taken place at the expense of grazing lands (15). This trend has grown in spite of many planners' warning against it. It is a land use leading to economic results which are largely a matter of chance. Eckholm, for one, suggests that in many desert regions of the Middle East, agriculture has already been extended to parts where rainfall is unstable and soils are highly erosive. Successful animal husbandry in these areas will necessitate reducing the cropped

area. The chain of adverse impacts of that intrusion was predicted a decade ago. Eckholm and Brown write:

The increase in cultivated areas has often meant inadequate land-use, an obvious consequence of which is the destruction of the fragile plant cover and increasing erosion. This brings on the common process of man-induced desertification, which remains the principal cause of the extension of desert areas (16).

Relevant Objective:

- To maximize the diversification of the economic base of both nomadic and farming communities.

4.4 Problems of Urban Development

Urban development is an integral component of national planning ambitions. It is considered an important objective, one that is stated by most governments in the arid Middle East. Therefore, there is a common emphasis on the role of the construction industry within the national development plans of these countries. The Second Five Year Development Plan (1975-1980) for Saudi Arabia, for example, emphasized development of physical infrastructure to support the achievement of five other primary goals. These encompassed economic, military, social, health, and moral goals. As a result, the construction sector contributed about 4.4 percent of the Gross National Product in recent years, roughly the same as the manufacturing industry (17). Similarly, for other arid countries of the Middle East, construction has become the most important industry after oil. Unfortunately though, construction practices, landscape management, and urban development in general are notably poor in various parts of that region. This condition is caused by a variety of problems which would be difficult to discuss briefly or list comprehensively. It is possible, however, to highlight the problems characteristic of the arid Middle East and classify them into five groups as they relate to climate, history, human resources, existing institutions, and basic needs.

4.4.1 Problems of climate

The impact of heat on people is an impediment to urban activities. Hyperthermia, fatigue, and other climate-related problems are often aggravated by poorly designed environments or by lengthy exposure to the elements. Serious sunburn and dehydration from the wind and the sun reduce the productivity of the urban residents of the arid environment.

Harsh climate during the prolonged, very hot and dry season is also a hindering factor to the construction industry. As an alternative, much work is attempted during the shorter cold season, resulting in crowded and demanding construction schedules.

The desert wind, in particular, is capable of doing great physical damage. It carries fine particles of soil which etch glass, clog mechanical devices, and accumulate on every surface. These loose particles of dust do not represent a case of land erosion only, but they have a far-reaching effect on the urban microclimate as well. Because the blown dust is often thick, it acts like a lid, preventing the formation of warming updrafts which might turn overhanging moisture into rainfall. As a result, the scarce phenomenon of rain is further decreased as if aridity is self-perpetuating and self-enlarging in the arid urban environment.

Another common climatic problem is atmospheric inversions. This phenomenon encourages the concentration of pollution above cities causing a threat to health.

Relevant Objectives:

- To promote and ensure the reduction and dispersion of air pollution.
- To maximize the physical isolation of air contamination sources.
- To establish and maintain wind barriers, noise screens, and green belts.
- To identify and prepare landscape plans for areas affected by sand storms.

4.4.2 Problems of city origins

Urbanization in the arid Middle East is an extremely challenging task. Although rapid growth of desert cities is relatively recent, most of them are of ancient foundations. As a result, their historic centers are poorly equipped to house, employ, feed, and provide services for the enormous influx of newcomers that has occurred in the last three decades. For example, the central sections of a traditional Muslim town are typically characterized by an intricate network of narrow streets and mixed land-uses, rugged topography, and high density of population. These new and inherited conditions have led to a noticeable disregarding of traditional architecture and planning methods and techniques which were relatively efficient in terms of climatic control. As a result, a totally unsuitable and contrived "modern" architecture on one hand, and haphazard shanty towns on the other replaced the appropriate methods and techniques of the traditional Islamic architecture.

Relevant Objectives:

- To stabilize or increase the quality of living spaces throughout the urban settlements.
- To restore, revitalize, or conserve sites which have particular historic or architectural significance.
- To maximize the integration of social and cultural concerns in urban planning.
- To minimize maintenance costs of new and old structures.
- To minimize cost of maintenance of structures.

4.4.3 Problems of human resources

Urban development efforts in the arid Middle East, particularly among the oil rich nations, are suffering from a shortage of skilled native labor. Saudi Arabia, for example, employs hundreds of thousands of workers from foreign countries to implement the construction projects across the Kingdom. More serious is the short supply of locally trained and qualified architects, engineers,

and planners. Major development decisions and planning projects have been predominantly assigned to foreigners, most of whom are alien to the desert environment and to the dominant Islamic culture.

Relevant Objectives:

- To encourage and support landscape planning objectives and research efforts in arid land studies.
- To maximize the number and diversity of opportunities for citizens of the region to participate in professional education and training experience.

4.4.4 Problems of existing institutions

The problem of urban settlements is, above all, a problem of institutions, i.e., the traditions, laws, and structures by which communities and nations are organized. In many countries of the arid Middle East, existing institutions are ineffective if not totally obsolete. They are incapable of controlling the process of urban sprawl, providing basic needs of food and shelter to the majority of the people, halting environmental deterioration, or maintaining and monitoring acceptable standards of living and the quality of urban life. For example, there is very little governmental control or standards in force at the construction sites. Work crews, service vehicles, and construction equipment cut across the land in every direction they wish. This creates an additional measure of dust, affecting people, plants, and machinery (18).

Relevant Objectives:

- To establish construction standards and maximize their enforcement.
- To maximize legal, medical, emergency, and security communications across the region.

The pressure of urban growth has spread cities out disproportionately. Baghdad, for example, reached 19 miles (31 km) long (19) and Cairo extended to more than 16 miles (26 km) along its the

northeast-southwest axis (20). Such urban sprawl has made the organization of traffic more complex and the costs of transport more expensive. Low levels of municipal revenue make modern urban solutions difficult. A mile of subway construction, for example, can cost as much as 10,000 small homes (21).

Relevant Objectives:

- To minimize the total travel time between home and work or shopping areas.
- To maximize the hierarchy of streets in order to reflect wide functions and capacities.

In brief, municipal governments in most of these cases are being overwhelmed by the problems facing them. They cannot control the growth, nor can they provide adequate housing, public services, or amenities. In his book, Environment, Natural Systems and Development: An Economic Valuation, Hufschmidt outlines the institution-related problems facing countries of the Third World in general. Many items in his list are readily applicable to the problems of urban development in the arid Middle East. They include:

1. Inadequacies and difficulties in collecting and processing data.
2. Lack of precise records of past trends and conditions, thus limiting the quality of analysis and prediction.
3. Low public awareness of how to participate in planning and management decisions which are carried out solely by governmental agencies.
4. Widespread market failure, which requires extensive use of shadow prices to replace market prices.
5. The often perverse distributional effects of some policies and programs, which may worsen the existing situation.
6. Inadequate monitoring and enforcing of existing or suggested laws and standards (22).

Relevant Objectives:

- To minimize capital investment and permanent labor forces associated with administration and government.
- To maximize the benefits received by citizens from the governmental agencies.
- To maximize the cost effectiveness of the community as a managed system.
- To evaluate community government and administration at least every 10 years.
- To maximize the amount and quality of public participation, registration, and voting in governmental issues and elections.

4.4.5 Problems of basic needs

Human survival, at the most basic level requires air, water, food, and shelter. In the planning and management of urban developments, these biological needs are subject to degrees of quantity (both stability and amount), quality, access, and cost. For obvious reasons, these four factors are particularly significant in the case of water resources in the arid Middle East. The large water consumption in towns is a serious hindrance to urban development. It aggravates the problem of competition for water between agriculture, industry and cities. Baghdad, for example, consumes 34,000,000 cubic meters a day from the Tigris (23). Misuse of water, waste, and various losses have resulted in situations where groundwater is not replenished, conservation and recycling efforts are not adequate, and even innovative drainage techniques and pollution controls are not sufficient. Groundwater, in particular, warrants special elaboration. Groundwater aquifers are a means of storing and transmitting water. The decision to establish large urban settlements based only on the exploitation of stored groundwater is often questioned on moral and ethical grounds (24) and therefore always faces opposition on many levels.

Relevant Objectives:

- To maximize the probability that all citizens can secure a continuous supply of adequate food and drinking water year around.
- To minimize food and water costs to citizens.
- To maximize the mean nutritional status of all citizens.
- To minimize malnutrition within the community.

4.5 Problems of Industrial Development

Technology has a crucial role to play in developing arid and semi-arid lands. In the past, various societies have succeeded in overcoming the physical adversity of the desert environment by perfecting technology. Irrigation technologies, for example, have transformed barren desert areas into fertile regions on which human settlements were sustained for centuries. Some of these settlements were recently discovered in Arizona and New Mexico, and many were already known in the Middle East and across the African Sahara. Both the intensive use of modern advanced technology to facilitate human settling in adverse arid regions, and the introduction of various types of industrial activities to diversify the desert economy are not new phenomena. The southwestern regions of the United States, for example, have taken advantage of these two avenues and have achieved spectacular standards of development. This process, one should note, has followed a pattern of slow and gradual growth (25).

The arid Middle Eastern countries, however, are witnessing a somewhat different phenomenon. The rapid and intensive use of advanced technology in the form of planned, large-scale projects, is an experience which has never occurred anywhere before to the extent currently being realized in the arid Middle East (26). A very detailed and satisfactory account of the problems and potentials of industrialization in some of the countries of that region have been given by UNESCO (1977),

Farahat (1980), and of Saudi Arabia, in particular by Abdel-Latif (1985). It is not practical to repeat here their findings, but it seems reasonable to highlight the most important ones. On the whole, there are five basic conditions for industrialization. They include the availability of water resources, skilled workers, raw materials, and the access to low-cost energy, and open markets.

4.5.1 Problems of water resources

Fluctuations of water table levels are a significant problem facing the efforts of all Middle Eastern countries to establish industrial development. Scarcity and poor quality of available water make it necessary, in most cases, to use industrial desalination. However, the cost of water obtained in this manner, including fresh water obtained by desalination of sea water, remains very high (27).

Relevant Objectives:

- To minimize the use and maximize the reuse of water in industries.
- To develop improved methods of desalination of waters of the region (sea, ground, brackish marshes, and others).

4.5.2 Problems of human resources

The U.S. Office of Technology Assessment (OTA) has studied five countries of the arid Middle East including Algeria, Egypt, Iraq, Kuwait, and Saudi Arabia (28). In its report entitled "Technology Transfer to the Middle East", OTA suggests that a shortage of technical and managerial personnel has been chronic. In addition, it has been difficult to use foreign technologies and personnel in meeting development objectives without creating irreconcilable conflicts with traditions (such as separating sexes, family ties, etc.) and among various conservative groups in the society (primarily clergymen and Muslim fundamentalists). The study concludes that although industrial trade with these nations has been significant, technology absorption has been less successful. Due

to the mandate of the OTA and the specificity of that report, very little was said about what may have caused these difficulties.

Modern industry has come only lately to most of the arid Middle East. With the exception of Egypt, which had an impressive beginning in the 1830's, most other countries have maintained, on the whole, a non-industrial economy. There was simply no demand or opportunity for individuals with advanced technological training or skills. Even when they were available in the market, their work performance seemed relatively inefficient.

Some experts suggest that climatic constraints, coupled with several diseases connected with the extreme aridity and solar exposure, constituted a very real difficulty to industrial development. A study shows that in the Sahara, the curve of accidents in the oil industry closely follows the curve of temperatures (29). Another study has shown a deterioration in tasks requiring alertness, for example, the number of mistakes increased geometrically with the temperature climbing above 34 degrees C.

Relevant Objectives:

- To maximize the number of citizens employed within the communities.
- To maximize the opportunities for every citizen to achieve his/her genetic potential.
- To minimize total accidents to workers and property within the industrial areas.

4.5.3 Problems of economics

The problems of industrial development vary considerably from one developing country to another. In the arid Middle East, however, there are various groups. The oil rich nations with a high per capita income, such as Abu Dhabi, Kuwait, Libya, Qatar, and Saudi Arabia, suffer from a shortage of human resources and a limited domestic market. They have, however, substantial financial resources.

In contrast to the above group of countries, the oil-rich nations with a lower per capita income, such as Algeria, Iraq, and Egypt, have more favorable conditions for industrialization. The labor force is larger, the communication network is fairly well developed, and the mining resources are more diversified (30). Often, though, development priority is given to agriculture and food security projects in order to satisfy the basic needs of a large population. This is illustrated in the 1981-1986 National Development Plan of Egypt.

The high cost-to-benefit ratio of transportation projects is another factor influencing industrial land use in the arid Middle East. An effective transportation network is, of course, an essential base for industrialization. The railroad, in particular, has proven successful in overcoming the challenges of aridity and distance. Though topography and soils in that region are generally favorable to building such a network, the main problem is economic. Without having sufficient goods to move, no transportation network will be profitable.

Relevant Objectives:

- To maximize industrial diversity.
- To minimize industrial impacts on the environment.
- To minimize industrial use of high quality agricultural land.
- To minimize transportation network capital and operating costs.

4.6 Problems of Recreation and Tourism Development

Some landscape planners, ecologists, and conservation groups tend to favor recreational use for arid lands. They apparently see this new form of land use as a development alternative of major potential and an important option that should be encouraged. Ghabour, for example, has once suggested that recreational land-use seems less destructive than intensive agriculture or feedlots for livestock (31). He further recommends that recreation be closely linked to the establishing of a

network of national parks and nature reserves along the Mediterranean desert of northwest Egypt. This network would protect part of the environment and serve as a base-line for environmental monitoring.

Visionary as it may be, the true picture has not been fully delineated. Recreation and tourism developments have their inherent problems that must be added to the problems characteristic of the arid Middle East. The following survey highlights the latter.

4.6.1 Problems of the marketplace

The tourism industry in the arid Middle East encounters a number of economic problems such as a seasonal fluctuation in numbers and trends, a dependence on foreign demand, an exposure to international competition, and above all, a remarkable sensitivity to political uncertainty. On the supply side, the tourism industry in arid and semi-arid lands always faces an important condition, i.e., a need for infrastructure such as delivery of fresh water, good quality hotels and camping facilities, and reliable communication and transportation systems. These many prerequisites for successful tourism tend to create resentment against recreational land-use among the public in most developing nations.

Relevant Objectives:

- To diversify and integrate the tourism industry so that it becomes a stable source of revenue and employment.
- To maximize local corporate ownership of recreational facilities and lands.

4.6.2 Problems of competition for resources

Recreational land use and desert tourism are already growing in the arid Middle East and will probably expand further. Such growth competes with other uses for land, water, and for capital. Developing tourism areas along coastal deserts, for example, may push farmers off valuable lands (32). This has been observed in the case of Sousse in Tunisia (33). The most serious impact of tourism on the arid and semi-arid regions is, however, related to water supply. In an environment where water is a scarce commodity, tourism is, simply, a new competitor among many others.

Relevant Objectives:

- To minimize run-off.
- To minimize water table losses.
- To minimize water pollution.
- To maximize percolation and ground water recharge.
- To minimize the perception, by local people, of excessive use of water and other resources by tourists.

4.6.3 Socioeconomic problems

Arid and semi-arid regions seldom attract private investments for recreation development because the immediate return is much less certain than elsewhere. Also, the seasonal nature of tourism tends to tie up large sums of capital in luxury facilities in generally poor regions. An economic study in Tunisia shows that:

Tourism entails the import of expensive finished products, estimated between 14 and 27 percent of gross profits. This tends to reduce the inflow of foreign currency (34).

Finally, the correct perceptions and positive attitudes of the people of the host country are crucial elements in the total context of recreational land use. If tourism proves to be oriented towards serving and/or benefiting foreigners alone, local people (triggered by nationalistic feelings) will resent

their dependence on other countries and an element of hostility may grow. This is more so with countries that have recently succeeded in gaining political independence (35).

Relevant Objectives:

- To maximize the balance between local tourist clientele and foreign tourist clientele.
- To maximize at least one major index of citizen satisfaction with the tourism industry.
- To minimize governmental expenditures and services directed towards foreign tourists only.

How has the field of landscape planning responded to the above problems and issues in the arid Middle East? The next chapter will present a survey of key developments recently implemented in various countries of the Arid Middle East as well as the current roles played by landscape planners within that region.

4.7 Discussion and Summary

The examination of problems facing the six most common land uses of the arid Middle East suggests that a good mechanism for surveying and monitoring the environmental conditions exists. By applying the "Problem-Focused Approach" to this wealth of information, an operational list of objectives was generated. Although the list is neither assessed nor ranked, it is systematically classified into six groups of objectives. They are pastoralism, irrigated agriculture, rain-fed agriculture, urban development, industrial, and recreation and tourism objectives.

It is believed that this approach is a useful tool. It should be used within the proposed LAPOS, particularly during the first phase of the process, i.e., determining landscape planning objectives (Chapter 6.2). It is also believed that the lists produced through the "Problem-Focused Approach" alone are inadequate. Ideally, it should be supplemented by other lists of proactive objectives, i.e., based on potentials and ideals, rather than on problems and constraints. In brief, the reactive ob-

jectives concluded in this chapter illustrate the nature of the product of a "Problem-Focused Approach". The resulting objectives are mostly characterized by being negatively and retrospectively oriented. They specify where one does not want to be, and they involve the removal or control of something that is present but not necessarily desirable.

Footnotes

1. J. A. Lee, "Environmentally Sound Development and Disaster Prevention-The Linkage", Paper to the Swedish Red Cross Symposium, Stockholm, The World Bank, June, 1984.
2. UNESCO, Development of Arid and Semi-Arid Lands: Obstacles and Prospects, (Paris: Man and the Biosphere Technical Series, 1976), p. 13.
3. Ibid, p. 15.
4. Ibid, p. 16.
5. Ministry of Information, Government of the Arab Republic of Egypt, "Mohaffazat Al-Wadi Al-Jadid", The Governate of the New Valley,(Cairo: State Information Service, 1985), p.8.
6. UNESCO, 1976, p. 16.
7. Ibid, p. 17.
8. Ibid.
9. R. F. Dasmann, Environmental Conservation (Third Edition), (New York: John Wiley and Sons, Inc., 1972), p. 197.
10. UNESCO, 1976, P. 18.
11. W. F. Owen, "Living within the limits of aridity", in Ekistics , Vol. 16, 1977, pp. 291-296.
12. UNESCO, 1976, p. 18.
13. Ibid., p. 19.
14. Ibid, p. 21.
15. E. Eckholm and E. Brown, Spreading Deserts: The Hand of Man, (Washington, D.C.: Worldwatch Paper, 1977), p. 25.
16. UNESCO, 1976, p. 21.

17. K. Dalley and F. Tibbalds, "The current state of play in Saudi Arabia", Royal Institute of British Architects Journal, May 1975:164-165.
18. K. Kelly and R. Schnadelback, Landscaping the Saudi Arabian Desert, (Philadelphia: Delancey Press, 1976), p. 51.
19. UNESCO, 1976, p. 23.
20. W. S. Ellis, "Troubled Capital of the Arab World: Cairo", in National Geographic, May 1972, pp. 638-667.
21. United Nations, Habitat: United Nations Conference on Human Settlements, (New York: UN Press, 1976), p. 4.
22. M. Hufschmidt (Ed.), Regional Planning: Challenges and Prospects , (New York: Praeger Publishers, 1969), p. 7.
23. UNESCO, 1976, p. 22.
24. W. G. Matlock, Realistic Planning for Arid Lands: Natural Resource Limitations to Agricultural Development, (Chur, Switzerland: Harwood Academic Publishers, 1981), p. 113.
25. E. Stahrl, "Planning for technological development in desert regions", in Advances in Desert and Arid Land Technology and Development, A. Bishay and W. McGinnies (eds.), (New York: Harwood Academic Publishers, 1979), p. 31.
26. M. Abdel-Latif and W. Roeseler, "Settling the desert with advanced industrial technology", Ekistics, Vol. 24, 1985, p. 162.
27. UNESCO, 1976, p. 23.
28. Office of Technology Assessment (OTA), Technology Transfer to the Middle East, (Washington, D.C.: Government Printing Office, 1984), p. 2.
29. UNESCO, 1976, p. 23.
30. Ibid, p. 24.
31. S. Ghabbour, "The Role of the Landscape Architect in the Development of Coastal Desert Areas", Paper presented at the Congress of the International Federation of Landscape Architects (IFLA), Istanbul, 1976, 17 pp.
32. UNESCO, 1976, p. 25.

33. E. deKadt, Tourism: Passport to Development?, (New York: Oxford University Press, 1979), p. 303.
34. UNESCO, 1976, p. 25.
35. deKadt, 1979, p. 304.

Chapter Five: Key Development Projects in the Arid Middle East: Examples of the Inductive Approach

This chapter examines a second approach to determining objectives, i.e., the "Inductive Approach." The chapter provides examples of the dynamics of landscape planning in the arid regions of the Middle East. It delineates a context for this approach which is frequently used by the typical landscape planner for determining objectives. This approach is examined by means of an empirical analysis of selected case studies of recent landscape planning projects (See Chapter 3.5.1).

5.1 Introduction

The specific projects surveyed in this chapter were drawn from three Middle Eastern Arab countries: Saudi Arabia, Egypt, and Bahrain. Saudi Arabia and Egypt were selected for a variety of reasons which include familiarity, regional and international significance, and the size and nature of urban and regional development they experienced in the recent past. Bahrain, the only island state in the Arab world, was also included since it represents many qualities common to other countries in the Arabian Gulf. Bahrain is an example of the small arid Middle Eastern countries that gained independence in the 1960's and 1970's, has an oil-based economy, and is dominated by the Arab-Muslim culture.

Among tens of landscape planning-related projects that have been reviewed during the literature review period, only 5 are examined in depth and assessed in this chapter. Selecting this group of projects was influenced by the difference or the similarity of the project to other examples in the arid Middle East, and the availability of diversified sources of information upon which the author could draw and build his investigations.

Since this dissertation is limited to landscape planning objectives, a lengthy theoretical discussion of the developmental aspects of each of the three countries will not be given. Rather, this chapter provides an analysis of the major problems and issues that have faced decision makers in the arid regions of the Middle East, and of the manner in which experts in the field of landscape planning have responded to these concerns.

The chapter surveys key development projects in Saudi Arabia, explores some aspects of the environmental conservation scene in Bahrain, and finally examines the Egyptian scene.

5.2 The Saudi Arabian Scene

Saudi Arabia's oil reserves have made that Kingdom one of the world's wealthiest nations. In its effort to put this wealth to work for its people, the Saudi Arabian government embarked in the early 1970's on projects and programs outlined in a series of Five-Year National Development Plans.

With development projects stretching to all corners of the country, decision makers have recognized the importance of conserving some parts of their country, while intensively exploiting natural resources in other parts. Asir National Park demonstrates the former, while the establishment of Jubail Industrial Town demonstrates the latter (Fig. 5.1).

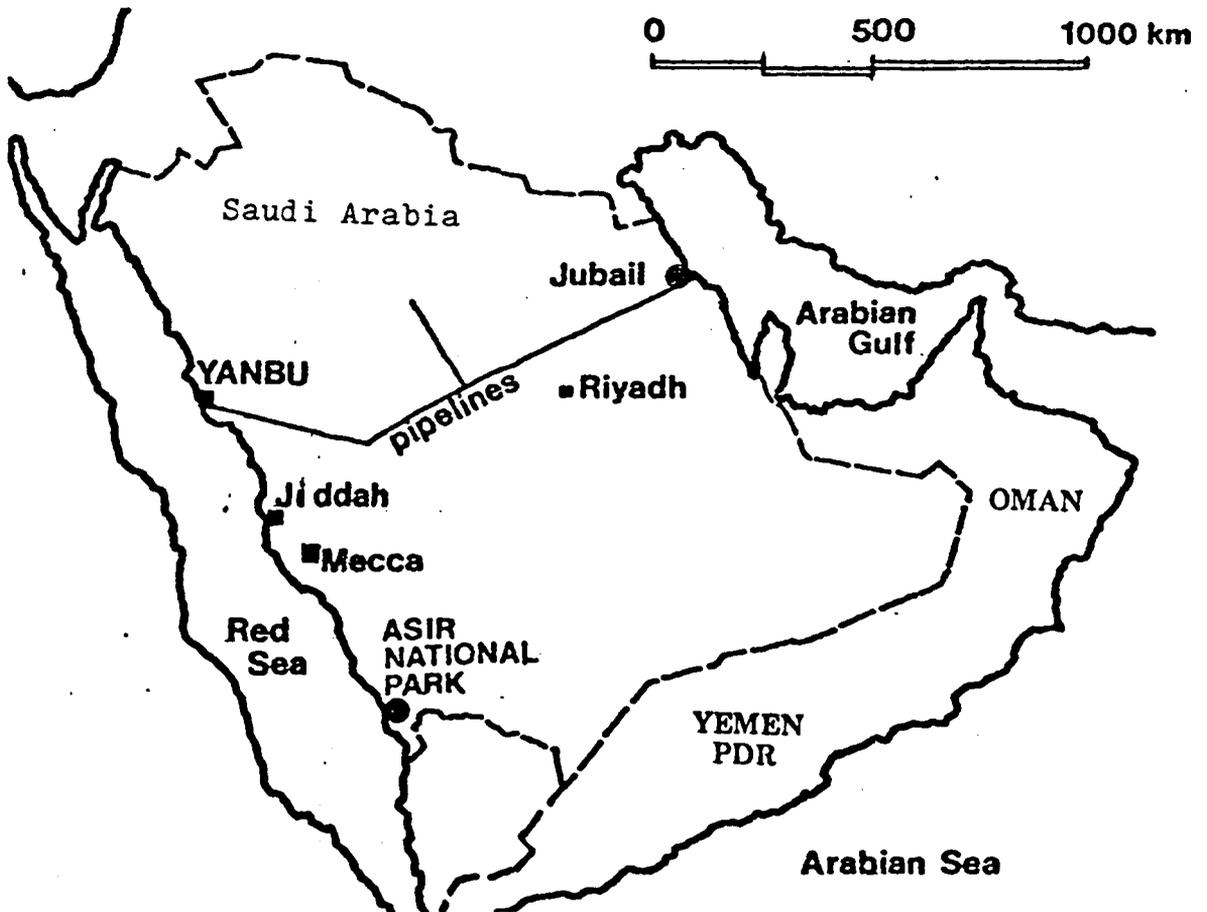


Figure 5.1 Map of Saudi Arabia showing the location of Jubail Industrial Town and Asir National Park

Source: Waller, Landscape Planning in Saudi Arabia, (1985)

5.2.1 Asir National Park

Asir National Park is the first major natural development of its kind in the Arab World (1). Almost a decade ago, the Government of Saudi Arabia established a policy to create its own system of national parks and related nature reserves (2). The idea, however, arose in about 1963, when increasing numbers of young Saudis started to travel to the United States for education and recreation. The Saudi government later retained Mr. Ron Walker, a former director of the U.S. National Park Service, as a tourism consultant. After travelling through the Kingdom, he suggested various strategies to develop the Saudi tourism industry. The Province of Asir was a priority in his recommendations.

The actual planning and development of Asir National Park has been a product of the cooperation between the governments of the United States of America and the Kingdom of Saudi Arabia. In 1975, the Saudi Ministry of Agriculture and Water contacted the U.S. National Park Service through the Joint U.S. Saudi Arabian Economic Development Program (JECOR) to assist in producing a master plan for the proposed park. A "Request for Proposal" (RFP) was placed in the Federal Register by the National Park Service for detailed design and site planning services. In early 1977, the National Park Service selected Wirth-Berger, an American joint venture firm, to develop preliminary drawings from the approved Master Plan (3). They undertook the work in association with the Saudi Arabian consulting firm, IDEA Centre. Although the park site was dedicated for public use in 1975, the planning and construction was ongoing until the park was officially opened in April 1984 (4). The development of the park has been a gradual process and its development is still continuing (Fig. 5.2).

A. Regional Setting

Asir National Park is located in the southwest corner of the Kingdom of Saudi Arabia adjacent to the city of Abha, the capital of Asir Province. It is approximately 640 km (400 miles) south

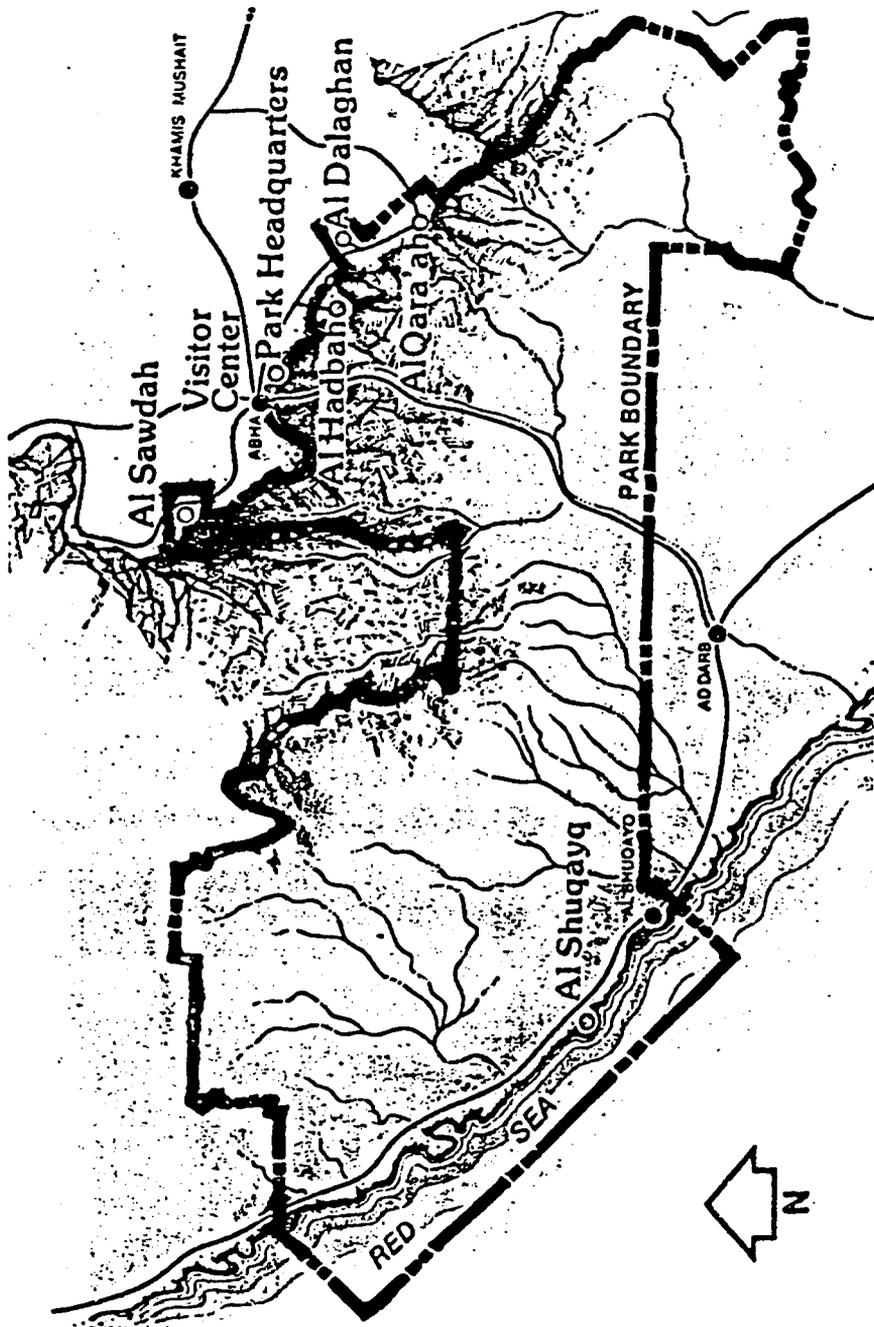


Figure 5 .2. Map showing the boundary of Asir National Park
 Source: Wirth, Asir national Park, (1980)

of Mecca, and less than 115 km (70 miles) north of the Yemen border. Compared to the 1,000 hectares required by the United Nations Registrar as a minimum size for National Parks and Equivalent Reserves, Asir National Park is vast. It covers over 450,000 hectares (1,125,000 acres) of land and sea, encompassing very distinct ecological zones; the Red Sea and Beach, the Tihamah coastal desert plain, the foothills and the escarpment, the high zones of forests and woodland, and Over the Top zone (5). The total population of the Province of Asir was reported in 1984 to be approximately 800,000 inhabitants scattered in more than 4,000 settlements. Asir is one of the regions that was previously inaccessible by vehicles and accessible only by dirt roads. Currently, though, it is served by two major highways. The first comes from Taif via Abha in the north and the second route comes from Jiddah and passes along the coast to the southern Province of Jizan. In addition, airport facilities and transportation by air have improved substantially. Scheduled flights are operating daily to Abha from major cities in Saudi Arabia.

B. Landscape Resources

Besides having some of the most scenic and spectacular landscape features of the Arabian peninsula, Asir National Park includes five different ecological zones, each with its own special topography, geology, hydrology, flora, fauna, climate, and cultural geography. The terrain includes coastal plains and highland mountains. The park site rises from the Red Sea to over 3000 meters (10,000 feet) in elevation within a narrow band 160-240 kilometers (100-150 miles) wide. The city of Abha, for example, is at an elevation of 1890 meters (6200 feet). The mountains of Asir are part of a continuous chain stretching down the length of the west coast of the country and are associated with the Red Sea Rift Valley. East of the escarpment, the elevation falls slightly to a fairly flat plain with rocky outcrops. Across this plain are villages and small towns. On the whole, three main topographic zones are encountered within the park site. They are: a) Tihama Plain, b) Scarp Mountains, and c) Hijaz Plateau (6).

All of Asir National Park falls within the Arabian Shield. Surveys showed that in the Park site, with the exception of Shuqaiq, three main types of rocks exist. They are: cristaline granitic type rocks, metamorphic shists, and sedimentary rocks. In addition, recent deposits can be encountered in valleys with a thickness that never exceeds 4-5 meters (12-15 feet).

As is the case throughout Saudi Arabia, the quality and the quantity of water exploited from shallow wells is not constant and is dependent upon the amount of rainfall and the type of rock. Hydrological surveys of the site showed that the ground water potential was generally limited and may be sufficient during rainy years only. Consequently, the engineering report recommended a variety of ways to supply water to different sites; these included: transporting by tank trucks, connecting to city networks or digging a well. Ultimately, however, integrating the use of groundwater with surface water was suggested as the best and most reliable solution for the water problem of the Park. The growth in population and urbanization of the whole region since the 1973 world oil crisis exceeded the concept of the park planner and hence required the construction of a desalination plant on the coast.

The ecological survey conducted by C. H. Lowe in October 1977, indicated that the site is the habitat of species (such as Bitis arientans, Bufo orientalis, Shrike, etc.) existing nowhere else in Saudi Arabia. The fauna includes, amongs, large and small birds, mammals, reptiles, snakes, and fish. Plant life within the park is the most diverse and abundant in the country. It includes cypress trees, palm trees, desert shrubs, juniper trees, and many others. In earlier times, the inhabitants of Asir have cultivated fruits, vegetables, wheat, and other cereals, as well as cash crops such as sugar, indigo, and coffee (7). Most of Asir is considered among the semi-arid regions of the world. It is affected by monsoon rains, where the annual mean rainfall varies between 300 mm and 500 mm (12-19 inches), the greatest amount in the country. Asir is the coolest region in Saudi Arabia. The temperature varies between 1.0 degree C (in January 1971) and 31.1 degrees C (June 1971) with indications that frost may be recorded once every 10 or 15 years.

C. Objectives of Asir National Park

The primary goal of the Asir National Park project is stated in a 1976 document, "A Management and Development Plan for the Asir Kingdom Park".

The purpose of the Asir Kingdom Park is to conserve for the people of Saudi Arabia an outstanding example of their natural and cultural heritage...as characterized by the Great Rift, its geology, plant and animal life, and cultural history...and to provide for the enjoyment of the region's resources by such means as will leave them unimpaired for the enjoyment of future generations.

In the same document, a set of management objectives was listed. There were 16 specific objectives that claimed to represent the

...desired conditions to be achieved in order to fulfill the purpose of the park. The objectives provide a framework that enables management to design operation, development and maintenance programs, as well as a standard by which to assess the progress of these programs (8).

This set of objectives addresses the following aspects of the Park: boundaries, land classification, wildlife, plantlife, research, agriculture and pastoral use, cultural resources, visitor use, information, interpretation and education, access and circulation, park facilities, concessions, design and construction, and maintenance. [See Appendix B]

Besides the primary conservation objective implied in the declared "Purpose of the Park" and the management objectives included in the 16-item set (Appendix A), another type of objectives is outlined, namely the governmental objective. Asir National Park has been a prototype for the Saudi system of national parks and related reserves. This governmental objective states the following:

To assure that the Park fits into such a scheme, and to assure that its development and management will be in concert with other activities of the government of Saudi Arabia relating to the development and security of the Kingdom, its planning and development should conform to a suggested "Policy for Kingdom Parks, Related Reserves and Antiquities" (9).

The above mentioned policy is in Appendix C.

Although economic objectives were not mentioned in any of the documents reviewed, it is certainly demonstrated in the actions and attitudes of various decision makers. For example, encouragement of tourist activities is consistently provided by the governor of Asir, Prince

Khalid al-Faisal. In 1981, for example, he set up a tourist and development department in Abha to advise and assist potential investors.

In 1980, Saudia, the national airline, started running four flights a day from Riyadh to Abha, and four from Jiddah to Abha. This recently-achieved accessibility, among many other reasons, resulted in two million people visiting the Park during 1984 (10).

D. Relations to National and Regional Development

National development, regional landscape planning, and strategic management are all modern phrases and thus alien to a very traditional society as Saudi Arabia. It was not until 1902 that the late Abdul-Aziz Ibn Saud, with his small band of Bedouin followers, established himself as King and began the unification of the Arabian Peninsula (11). Today his family leads a country, which occupies an area of 2,149,690 sq. km. (556,770 sq. miles), with an estimated population of 10,824,000 (1984) (12). As the country grew wealthier with the discovery of oil in the Eastern region in 1938, the whole scene changed dramatically. Today, the country has one of the highest levels of per capita income in the world. In many cases, the Bedouin has in one generation become a skilled oil field worker, plant supervisor, or jet pilot. He lives in a modern house and drives a foreign car. These dramatic changes have not necessarily been paralleled with similar changes in managing and governing the country. The King still rules in the style of a head of a family or a leader of a tribe rather than a head of a State. For example, he holds a weekly mailis (public audience) in which he tries to give real or symbolic attention to anyone who has a proposal or a problem. Paradoxically though, the Saudi government has been simultaneously going through the motions of sophisticated planning activities. Since 1970, the development of the Saudi economy has been guided by a series of five-year plans. The First Five-Year plan (1970-75) emphasized establishing a basic infrastructure (water and sewer, highways, harbors, airports, etc.). The Second Plan (1975-80) emphasized industrialization, and the Third Five-Year Plan (1980-85) shifted the emphasis to agriculture and food security. Obviously Asir National Park does not seem to coincide with

any of these plans. Nevertheless, the project has proven to be a pivotal catalyst of development for its whole region. The idea of dividing every part of the whole country into various provinces for administrative and management purposes has emerged only since the late 1960's. An Amir (Governor), usually a member from the royal family, was appointed for each province. The experts of the newly established Ministry of Planning quickly realized that these administrative entities which had been created did not necessarily coincide with the most logical and coherent economic regions. This realization consequently led to the decision to divide the Kingdom into six large planning regions. This division was ultimately included in the Third Five-Year Plan. By then, Asir National Park was under construction and was partially being used by the Saudi public.

E. The Hidden Agenda of Objectives

In the midst of these unusual circumstances surrounding the Asir National Park project, it is very difficult for a researcher to conclude with certainty what were the influential objectives that motivated the country to embark on such an enormous project, or to detect who were the main players behind the making of the initial decision. In the Middle East, hidden agendas are not unusual. The Saudi Arabian style of government is probably a fertile soil for hidden objectives to grow and be cultivated. Although the declared objectives were primarily tourism, conservation, and economic development, political objectives apparently played a major role in this case. It would be naive to disregard quickly this influence (13). By observing Faisal's political career as King until his assassination in 1975, one may suspect that determining, and later implementing this project were probably triggered by political motives. First, it could have been a way of imposing a status quo on a disputed territory. Second, it could have been an effective means of depopulating, or at the least, controlling and modifying the demography of the region. Third, it could have been a clever excuse to create an enormous land buffer which assures security in case of renewed hostility. Finally, it might have been a land-use gesture which symbolizes a peaceful intention and demonstrates a spirit of good will between neighbors, that is, Saudi Arabia and the Arab Republic of Yemen.

Until today, almost two decades after the inception of the idea of Asir National Park, its master plan and boundaries are only on paper. The Park covers an area of approximately 2800 square kilometers (1000 square miles), slightly less than the total size of the State of Rhode Island, U.S.A. The larger portion of this land mass is not yet developed. This includes most of the land west of Abha-Al-Darb highway which contains all the coastal plain and the Red Sea beach. Mr. Ronald Cooksy, the chief landscape architect with the International Affairs Office of the National Park Service and the liaison of the Asir Park project, indicated that implementing this portion of the plan has always been a low priority. The reason given is that access from the Park Headquarters to that section is very difficult because of its rugged terrains and recurring flash floods that destroy many crossings (14). He states that the initial strategy for Asir National Park was to achieve a noticeable success at the upper sections of the site, i.e. Sawdah, Hadbah, Dalaghan, and Qara'ah region. Later on, such a success would presumably encourage all the parties involved to develop the Coastal Plains portion. Mr. Cooksy acknowledges that a serious problem may now face the project completion since the major land of this undeveloped portion lies within the administrative jurisdiction of a different province. Unfortunately, the Amir of the other province is not enthusiastic about the Park, and consequently, participated very little in its development. Furthermore, he has shown interest in different ways of developing the Coastal Plains to enhance the economic development of his province. This situation may call for re-assessing the planning strategies.

F. The Cultural Gap

Asir Park is one of the most cosmopolitan endeavors of the oil-boom era. It was funded by the Saudi government, designed by American consultants, built by a Chinese construction team, and is currently being used by Saudi and other Arab nationals. The American consultants admit that they were asked to design a national park "just like the national parks of America" (15). They did what they were asked to do and no one challenged or questioned such a mandate. In fact, there was no mention, let alone an explicit objective, to consider or preserve the Islamic heritage that dominates the cultural life of this desert society. The absence

of such a design criterion is particularly serious in Saudi Arabia, a country which is based upon a historically deep-rooted alliance between Islam and the State, i.e., the power of the clergymen and the power of the ruling family. For decades, the men of religion of Saudi Arabia have argued that Islam has been and ought to continue to be central to all aspects of life. They have also criticized adopting innovations and taqlid, i.e., borrowing or copying from other societies. In fact, some scholars have suggested that the government's failure to preserve the Islamic cultural values resulted in the most threatening unrest in the country's history. Ochsenwald, for one, believes that:

The elite's perceived failure in the preservation of morality and criticism of excessive cultural borrowing from the West were among the reasons for the attack on the Meccan Haram in 1979. Suddenly a tightly controlled country, where the free public expression of dissent was nearly impossible, was shown to have a significant opposition, one willing to die for its religious position. The response of the Saudi government may be to give a greater place to symbols of Islamic identity (16).

In the case of Asir National Park, the cultural gap between the American designer and the typical Saudi user was manifested in specific instances regarding such issues as the separation of sexes, the definition of privacy, the rejection of western style bathrooms, the inadequacy of picnic areas for the Bedouin style food habits, and others. More subtle, however, was the total absence of planning principles and criteria that historically have influenced the development of the typical Islamic garden in the arid Middle East. These include such design concepts as: variety, multiple use, symbolism, individualism, equilibrium, contextual relation, aesthetics as a necessity in life, and a display of respect and love for all life-sustaining resources (17).

G. The Role of the Landscape Planner in the Process

With the exception of Walker's early tourism study, the landscape planner has maintained a continual role throughout the process. The first team of experts was sent to Asir in 1976 by the National Park Service. It was headed by Mr. Donald Humphery, a retired veteran of the U.S. Park Service. His team was comprised of a landscape architect, an architect, a civil engineer, a wildlife biologist, a park planner, and a park manager. Humphery, a generalist who previously served as a Ranger in the National Park Service, had an impressive record in leading

and coordinating multi-disciplinary teams. Humphery and his team were primarily assigned to identify suitable boundaries for the proposed Asir park, to suggest general zones of appropriate land-uses, and to prepare a conceptual Master Plan (18). Based on this Master Plan the Consortium of Wirth/Berger/Idea was hired. They were assigned the task of developing the conceptual Master Plan into site plans and construction drawings. The design development phase spanned throughout 1977 and 1978. No one from the Wirth/Berger group was stationed full-time in Saudi Arabia. The National Park Service, however, retained Mr. Richard Holder, a Park Management Specialist, in Riyadh. Hence, most of the design drawings and technical reports were prepared in the U.S.A. and shipped to Saudi Arabia to be implemented.

In early 1979, the construction phase started and two Resident Construction Supervisors were hired: Mr. Kenneth Magdziuk, a landscape architect representing the firm of Wirth-Berger, and another American park ranger representing the U.S. National Park Service. Both the Humphery team and Wirth/Berger design group succeeded most of the time in thinking and functioning as an interdisciplinary team in which all experts equally contributed to the process of generating and developing design ideas (19). Unfortunately, though, there seems to have been an absence of any landscape planning involvement in selecting, evaluating, or ranking the region against other regions in the Kingdom and no evidence exists to suggest that a comprehensive process of determining, assessing, and structuring landscape objectives was carried out by these landscape architectural teams or any other parties involved. Also, there is little evidence that the design team tried to facilitate public participation or to insist on identifying and reaching the potential users of the park. They unconsciously remained true to their Western culture. They concentrated on the natural ecology of the land and not on the social ecology within the Arabian culture. It appears that landscape architects from the U.S. Park Service and from the Wirth-Berger firm played the role of site designers rather than of landscape planners. It is suspected that these deficiencies are contributing to the current stalemate condition in developing the lower part of the park.

5.2.2 Jubail Industrial Town

Historically, industrial activities have lagged behind all other sectors of the Saudi Arabian economy. One reason for the lack of industry in Saudi Arabia was that natural resources that were known to exist before the discovery of oil were meager (20). Water in particular, which is a fundamental natural resource, was very scarce. This scarcity caused the Saudi to be foremost practitioners and promoters of the desalination of seawater. However, this trend was always hampered by the high cost of desalinization. The sharp increase in oil revenue in the mid-1970's removed the financial constraints on industrial development. Money was available to finance any project thought desirable. Consequently, the government adopted an overall development strategy which emphasized broadening and diversifying its economic base. This was to be partially achieved by developing industries which could optimize the country's oil resources, and then share the benefits of such development among the regions. Jubail Industrial Town and other similar projects represent an insurance policy or a safety net to the Saudi people against the eventual depletion of their oil reserves and the decline in demand for their oil production.

A. Background

Jubail is a foreign and unfamiliar name in most of the world today. By any standard, and particularly by town-planning standards, the development of Jubail is a massive undertaking. The building of this town is the largest construction project in the world today, if not of all time (21). Jubail has through the centuries been a small port serving as a center for fishing, oyster catching and pearling. The one time small village of 5,000 people on the Persian Gulf has been systematically turned (since 1975) into the main industrial center of the Eastern Province of Saudi Arabia.

The idea of the Jubail Industrial Town originated in 1973 during a meeting between the late King Faisal of Saudi Arabia and the top managers of International Bechtel Incorporated, a

California-based engineering and construction firm. The King expressed his concern over the estimated \$1 billion worth of natural gas that had to be burned every year in the Saudi oil fields because no cheap way was found to transport it to where it may have been needed (22). A large industrial complex in Jubail was proposed to be developed as, “ ...the prime consumer of the 3.6 trillion cubic feet of natural gas per day which up to the late 1970’s were flared” (23). By mid-1974, Bechtel had prepared a conceptual Master Plan for the Jubail Industrial Complex which called for refineries, petrochemical plants, a steel mill, and an aluminum plant. To support these facilities, other components were also proposed including a desalting plant, a power plant, an airport, a major new harbor, a regional telecommunication system, and a new city of approximately 300,000 people. Based on that preliminary Master Plan, the government decided to retain the Bechtel group as construction manager, and a 20-year Program Management Services Agreement for developing the Jubail region was executed between that firm and the newly formed Royal Commission for Jubail and Yanbu (24).

The total costs of Jubail Industrial Town are hard to obtain through the published data.

Bechtel reports that the principal 16 heavy industrial plants alone would approximately cost \$15 billion, to which infrastructure costs, gas gathering, and power generation must be added.

In a more recent study, Hambleton notes that:

Saudi officials and the local press estimate the cost of the infrastructure and basic industrial facilities at between \$20 and \$30 billion. However, American businessmen tend to put the cost higher - as much as \$45 billion (25).

By the year 2000, this industrial town is projected to have 300,000 inhabitants and the total investment could well reach \$40 billion (26).

B. Regional Setting

Jubail Industrial Town is located in the Eastern Province of Saudi Arabia about 3 miles north of the old village of Jubail. It is approximately 105 kilometers (65 miles) northwest of the Dammam-Dhahran-Al-Khobar triangle and 400 kilometers (260 miles) from Riyadh.

The site, about 8,000 hectares (20,000 acres), is on land totally owned by the Saudi government. The site designated for residential use is northwest of the one designated for the industrial complex. There is a 1.6 kilometer (1 mile) wide strip buffering the community site from the primary industry. The strip consists of a narrow greenbelt and an area reserved for community-related and support industries (Fig. 5.3).

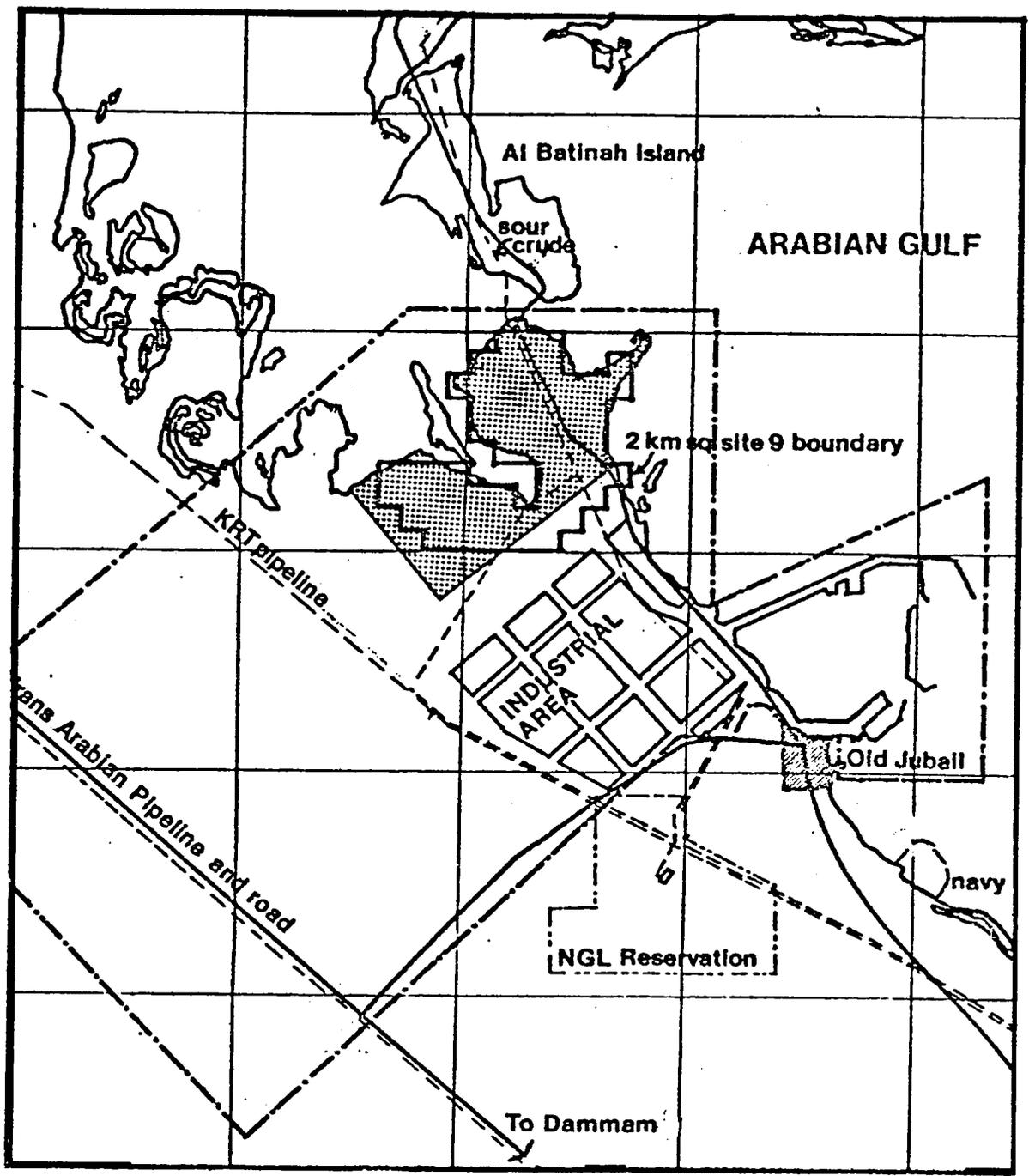
C. Landscape Resources

On the whole, Jubail is in an arid region characterized by low sand dunes and sabkhas (i.e., shallow depressions which collect runoff) and salt encrusted flats at or near mean sea level. A primary advantage of the site was its suitability as a harbor. At Jubail, deep water is closer to shore than at any other location on the east coast of Saudi Arabia, except for Ras Tannurah, which has been fully developed since the early 1960's. The Jubail area was the best remaining location for the deep water harbor to support an industrial complex of such enormous size. Upon completion, Jubail's industrial harbor will be one of the largest in the world (27). Deep water was also necessary to the Industrial Complex to meet the requirements for seawater cooling and for the desalinization plants feeding fresh water for residential and industrial uses.

Developing a land-use plan was a challenging task. In spite of efforts to maximize coordination and to consider site conditions (such as major facilities in existence, under construction, or planned by others), numerous compromises and several detrimental changes were made in the final Master Plan.

D. The Role of the Landscape Planner in the Process

Site selection, based on a comprehensive landscape resources survey and analysis, was the key to the major physical problems that have had to be solved in this development. Exhaustive efforts were made to provide an inventory and description of the landscape features and natural resources of the region. According to Bechtel's technical reports, the basic idea behind that



- ROAD) ———
- PIPELINE - - - - -
- ROYAL COMMISSION CONTROL AREA BOUNDARY. - . - . - .
- SITE AREA [hatched pattern]

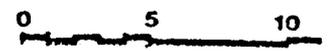
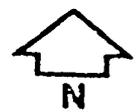


Figure 5.3 Jubail Industrial Town and surrounding region
 Source: Waller, *Landscape Planning in Saudi Arabia*, (1985)

exhaustive inventory was that the planners needed to know what existed in the area before formulating any alternative or before selecting any site. The efforts to select suitable alternatives for siting the industrial complex, the residential community, and the harbor and port proceeded simultaneously. The historical background of Jubail Industrial Town project highlight two notions. First, three different and independent parties were responsible for site selection decisions. In 1976, the industrial complex site was selected by Petromin (The Saudi National Petroleum Corporation). The sites for the industrial harbor and the commercial ports were selected by the Ministry of Communication, and finally the selection of the site for the residential community was assigned to Bechtel Group. Bechtel initially considered three alternative sites. After some investigations, the northern site was recommended because it had the fewest problems and was on the coast. This allowed water-oriented recreation to be developed for the community. Ultimately, however, the final decision about this site had to be made almost a year later by Colin Buchanan and Partners, the urban planning firm which was selected for the project (28).

Second, major decisions related to siting the three major components of the new town, i.e., the industrial complex, the harbor and ports, and the residential community, were taken prior to the detailed landscape resources inventory completion. In fact, the three siting decisions were included in a technical report entitled "Volume IV - Resources and Site Analysis" in which the author lists nine landscape resource inventories to be carried out as soon as possible. The list includes the following: topographic survey, marine survey, soil survey, groundwater survey, sand and rock reconnaissance survey, water quality survey, meteorological and climatological survey, air/noise monitoring, and biological survey (29). Therefore, it is not surprising to find out that the proposed site for the new Jubail international airport is recently reported to be subject to massive sand drifts which are very expensive to deal with in retrospect. On the whole then, major decisions were made prior to the actual involvement of the landscape planning and the urban planning consultants. These decisions were related to site selection and projected population. In fact, the planning consultants were given a very limited search area

to locate the residential sites. By the time they joined the project team in 1977, several factories within the industrial complex were operating. To the dismay of everyone, all the available sites were sub-optimum by ordinary standards of construction development. Indeed, most of the land was prone to flood, and therefore required massive amounts of fill.

5.2.3 Discussion and assessment

National scale planning plays a major role in the current affairs of most of the lesser developed countries. This is true in large projects such as building new towns and/or industrial complexes. In Israel, for example, new settlements in the Negev Desert have been viewed from the perceived necessity of national security. Therefore, planning and development outputs have tended to be measured by non-economic values. This may explain why the government of Israel has been supporting these projects in spite of their high economic price. Similarly, Jubail Industrial Town is not merely a project to capture the previously wasted 3-4 trillion cubic feet of natural gas per day. Rather, it is a fulfillment of a long-term objective which Saudi Arabia and other oil rich countries have undertaken to diminish dependency on the petroleum sectors (30). Compared to other new towns that were built in Europe and North America, Jubail Industrial Town is immense in size. It comprises about 230 square miles, more than 20 times the area of the new town of Reston, Virginia.

Viewed in total perspective, the objectives of Jubail Industrial Town seem to coincide with three of the six major goals included in the National Development Plan of Saudi Arabia. These goals are: a) to strive for the diversification of the country's economic base, b) to improve and enlarge the manpower base, and c) to develop non-petroleum industries throughout the country.

This section has examined the Jubail experiment which depends on advanced technology to develop an industrial town in an arid region. The development process utilized substantial human and material resources from local, national, and international sources (31). A few questions remain

unanswered, however. These are: a) Will this new town be able to survive and evolve into a permanent human settlement when the oil and natural gas is depleted?, b) Is this industrial complex, which was fully sponsored by the Saudi government, capable of surviving on its own economically and/or socially when it is turned over to the private sector for operation and maintenance?, c) Could the Saudis' heavy emphasis on vocational and technical training fulfill the labor requirements which have been primarily met by expatriate labor? Abdel-Latif, for one, has concluded that a positive answer to each of these questions will depend on the Saudi authorities ability to continue a sound and comprehensive planning measures. He believes that:

In the long run, the process would be considered incomplete if it did not lead to the enhancement of the physical as well as the social conditions of the country (32).

Based on their experience, former expatriate residents of Jubail strongly feel that this new town is an excellent place to live and work (33). The total physical environment shows a high standard of design and maintenance. Major pedestrian routes have a high degree of segregation from vehicular traffic and connect with playgrounds, schools, and the back entrances of many residences. The use of planted mounds created interesting enclosures to a basically flat landscape.

When questioned about drawbacks they experienced while living in Jubail, only the year round harsh climate and the social isolation were mentioned. It should be noted, however, that many natives and semi-skilled Saudi workers still prefer to live in the Old village of Jubail (34). The reasons given are that the new town is too western in its architectural and planning character, the social segregation is unusually polarized, the security measures are extremely limiting, and the shopping facilities are still inadequate (35). These are typical problems normally shared by most urbanizing societies under similar social and political conditions. More serious, though, is the dominant role that the government has played in setting the objectives of this project, and with other projects like it. Islami and Kavoussi believe that:

Saudi population has also become more dependent on the state as a consequence of the massive expansion of public-sector employment and the proliferation of various types of direct and indirect government subsidies (36).

This noted dependency on the state is potentially harmful in the long run. Future business people may always expect the same subsidy and support from the Saudi government and thus the spirit of private sector initiative would be lost.

5.3 Environmental Conservation in Bahrain

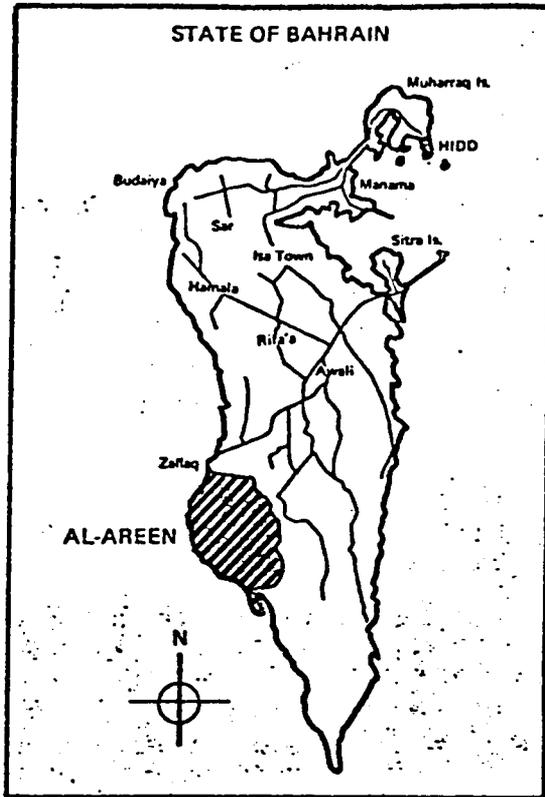
Bahrain is a country on an archipelago of 30 low-lying islands midway down the Persian Gulf about 24 kilometers (18 miles) from the east coast of Saudi Arabia (Fig. 5.4). It covers an area of 6679 sq. km. and its total population according to the 1982 census is 350,798 of whom 238,420 are Bahraini citizens. Agriculture and cattle breeding are practiced throughout the island.

Al-Areen Wildlife Park and Reserve is located in the southwestern part of Bahrain's main island, in a natural desert site accented by some arid vegetation salt flats, low-lying coastal sand dune, rimrock, pools of water, and swampland (37). The park is 8 square kilometers (2,000 acres) in area located at Al-Markh which is 5 kilometers (3.5 miles) south east of Jabal Al-Dukhan and 2 kilometers (1.2 miles) from the Zalaq shoreline in the State of Bahrain (38).

5.3.1 Background

Al-Areen Wildlife Park and Reserve is the inspiration of Crown Prince Hamad bin Isa Al Khalifa, who has been a major force behind its realization. The project is one of the first attempts to revive the traditional Islamic view of nature, stressing the interdependence between people and their environment. This is manifested in various ways. For example, upon their arrival, all visitors are handed an official handbook of the facilities. A relevant citation of the Holy Qu'ran is on the front cover of that pamphlet. It reads:

No creature is there crawling on the earth, no bird flying with its wings, but they are nations like yourselves. We have neglected nothing in the Book, then to their Lord they shall be called.



Al-Areen

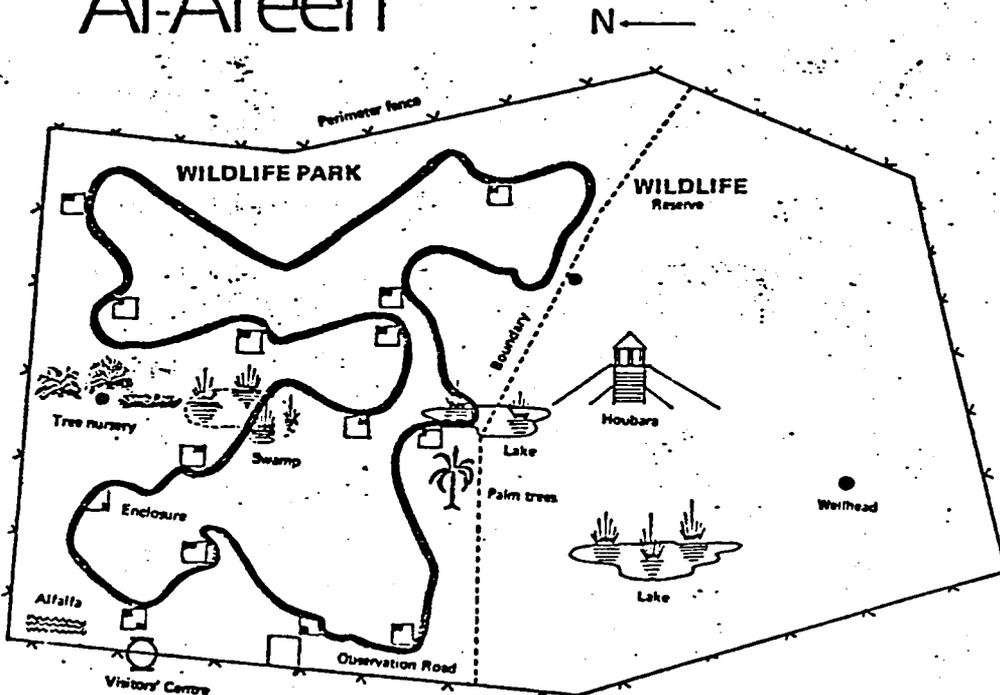


Figure 5.4. Al-Areen Wildlife Park and Reserve
 a) Map of Bahrain
 b) Master Plan of Al-Areen

Source: Izzeddin, Al-Areen Wildlife Park, (1982)

Prince Hamad had realized years earlier that the state of the desert landscape in most Arab countries illustrates a lack of observance of Islamic teaching of the past and/or scientific principles of the 20th century. From Iraq in the north to Yemen in the south and from Oman in the east to Morocco in the west, massive destruction of rangelands, forests, and farms by nomadic herdsman and farmers deprived many of the larger wild animal species of their natural habitat. This was followed by systematic but thoughtless hunting which brought them to the verge of extinction. Being a hunter himself, and an heir to the Bedouin tradition of the desert, the Crown Prince showed a real concern. Initially, a zoo was suggested, but gradually the project evolved into a hima, an Arabic word symbolizing a heritage of conservation with roots deep in the arid regions of Arabia. Historically, hima, a protected reserve of land, was established by Muslim leaders to allow flora and fauna to flourish undisturbed by people, and to control grazing of valuable ranges, rivers, and fertile farms.

5.3.2 Landscape resources

The 2 km x 4 km (2.9 square miles) site of Al-Areen varies in topography and soils from salt flats about three meters above sea level on the western boundary, through undulating vegetated sand dunes, on up to the rimrock of the east with heights of up to 45 meters (140 ft) above sea level (39). Sand and sandy loam are the main surface soil texture. They are highly permeable with infiltration rates higher than 10 cm/hr (40). The climate of the park and reserve is marked by high temperatures, scanty and irregular rainfall, high relative humidity, and a recurring wind from the northwest. To irrigate the approximately 90,000 introduced trees, shrubs, and fodder areas, three tube-wells were drilled and connected to a trickle irrigation system. A common example of the introduced vegetation are thousands of acacia and eucalyptus. Among the natural vegetation are the broom bush (Pophyllium sp.) which provides shelter for hares, rats, jerboa, and a number of reptiles. The date palm (Phoenix dactylifera) is considered the best-adapted fruit-bearing tree in Bahrain and provides a nutritive feed for many types of wildlife. It was generously introduced around the visitors center. Bahrain is also blessed with a diverse birdlife. Over 250 species have been recorded in the

country, however, only 50 species, including Kori Bustards, Secretary Birds, and Crowned cranes have bred on the islands during recent years. Many of these occur in small numbers because their nesting habitat has been restricted under the pressure of the urban development, which has intensified since the oil boom of the 1970s.

5.3.3 Objectives of Al-Areen

The objectives of Al-Areen appeared to be fairly clear and informative to a lay person. They include the following:

- To restore endangered Arabian wildlife--to keep them intact, unimpaired and thriving for future generations to enjoy (41).
- To educate the public about the importance of nature conservation (42).
- To illustrate the role that animals play in nature (43).
- To demonstrate humans' relationship to their environment (44).
- To revive the Islamic view of nature in its totality, stressing the interdependence between man and his environment.
- To be able to have sufficient stock of indigenous wild animals to re-introduce them to the whole desert landscape of the island of Bahrain.
- To achieve maximum self-sufficiency of animal forage within the reserve (45).
- To transform parts of Al-Areen site, through planting suitable trees and shrubs, into scenic areas, and to modify the surrounding micro-climate as well.

The above listed main objectives of Al-Areen Wildlife Park and Reserve were never grouped, consolidated, or published in one comprehensive document. Instead, the research revealed that they are scattered in a variety of sources among which are news releases, pamphlets, magazine articles, etc.

Mr. Faisal Izzedin, the former deputy director of the park and a key figure behind the project between 1978 and 1983, has suggested various explanations for the absence of a singular comprehensive document (46). For example, he found that, in Bahrain, some decision-makers disliked technical reports, particularly long and complex ones. He remembers one Minister in particular who did not allow any of his guests or subordinates to carry papers, files, or reports inside his office. This unusual tactic suggested that the Minister was either unwilling to read any complex reports or that he was unable to make an immediate commitment, particularly on paper (47). Another explanation, also suggested by Izzedin, is related to the planning process. He admits that an orderly progression of inventory, analysis, synthesis, and evaluation of projects or policies did not happen most of the time. He further recalled that in his capacity as a regional advisor to the United Nations Environment Programme (UNEP) between 1976 and 1979, he sensed that some decision-makers in many oil-rich Arab governments suggested projects and after the fact tried to justify them by fabricating a set of objectives to suit them (48).

5.3.4 Al-Areen master plan

After the entire area was completely fenced, the site was divided into two sections; the park and the reserve.

The Park being developed for public use covers an area of 2 km x 2 km (1.54 square miles). A 10 km (6.3 miles) winding roadway enables visitors to view all the different features, exhibits, and particularly desert animals living in a free, but protected environment. The following native animals are some of those which were re-introduced into the park after many years of extinction in Arabia: Arabian oryx, Nubian ibex, Addax, Arabian gazelle, Arabian tahr, Reem gazelle, Defassa waterbuck, Hunter's antelope, Thompson's gazelle, Beisa oryx, Lesser kudu, and others (49). The park also contains the Visitors' Centre building and the Salman Falcon Centre for breeding wild birds, such as peregrine and Saker falcons. For centuries, the Arab people have trained these birds for hunting.

The reserve, on the other hand, located south of the Park, was left essentially in its natural state. Local Bahraini wildlife such as the Dhub lizard, the desert hare and a number of native birds were left undisturbed by hunters and consequently their numbers increased substantially. Public access to the reserve is prohibited. Staff and visiting experts view most of the Reserve from an observation tower. This tower also serves as the central support of a Houbara enclosure 150 meters (500 ft) in diameter. In this enclosure, captured Houbara are observed and encouraged to breed.

5.3.5 Discussion and assessment

Unlike other environmental conservation projects throughout the arid Middle East, which quickly appeared and vanished during the last two decades, Al-Areen has shown impressive results. During the first full season, October 1983 through April 1984, 5,000 of Bahrain's school children paid visits to Al-Areen (50). This school program, in cooperation with the Ministry of Education, involved a guided tour and distribution of booklets on conservation.

Has the effort to impress some environmental ethics and conservation values upon Bahraini society, via their school-age children, succeeded? Has implementing Al-Areen Wildlife Park and Reserve modified the public image of wildlife from being associated with hunting and sports, toward being a valuable resource that ultimately affects the survival of humankind itself? These questions and many others cannot be adequately answered since no study has been conducted to assess the project and measure its accomplishment. This deficiency points also to yet another drawback in the way Al-Areen's objectives have been stated. Dimensions of space, population, demand, etc., were not specified for measurement.

Research has shown no evidence that this project was conceived as an integral part of a total regional landscape plan or environmental conservation program. Administratively, Al-Areen has been reporting directly to the Prime Minister, the second highest authority in the country. It is intriguing to notice that other Arab countries share a similar unusual arrangement for accountabil-

ity. In the Sultanate of Oman, for example, the office for Conservation of the Environment is directly attached to the Bureau of Royal Court Affairs (51). In Egypt, the Environmental Affairs Agency is directly connected to the Council of Ministers' office. As a result, most case studies display an absence of public participation in the process of determining or assessing the landscape objectives of each project. Izzedin asserts that, based on his experience in the Arab world, objectives were initiated, modified, and implemented by two parties only--political leaders and technical advisors. He further believes, that until such time when the public becomes aware of environmental issues and educated about conservation and development matters, the currently-used disjointed incrementalism will remain the approach to planning in the arid Middle East. Also, the role of technical advisors will continue to be limited to implementing or justifying the implementation of objectives he or his real client have never even determined.

The survey has also indicated no professional landscape architectural contributions to this project. In spite of the significant role a landscape planner could have played in developing such a park, the work was primarily carried out by civil engineers, architects, and agriculture and forestry consultants. This absence demonstrates the existing shortage of qualified Arab landscape planners and the lack of awareness of what a landscape planner does or should do.

In conclusion, the set of declared intentions for this project was contained in an array of documents. These stated intentions have provided the planner with a set of general goals that has enriched the project and allowed it to evolve from a mere symbol of pride for a single leader to a catalyst of environmental awareness and education for a whole country. However, there was a lack of criteria that may have been utilized in measuring the degree of the project's accomplishment. The conceptual goals have not yet been translated into a set of specific objectives which could be useful tools to managers and decision makers alike.

5.4 The Egyptian Scene

Egypt has the longest continuous history of any country in the world today. Its history is full of drama and excitement. Its achievements have reached tremendous heights, and at times, its challenges have appeared to be insurmountable. Through it all, the glory, the turbulence, and the quiet periods, Egypt evolved into a dynamic country with a charismatic landscape personality or “genius ioci” (53). A researcher may conclude that Egypt is a unique land with an extraordinary and complex landscape character.

5.4.1 The landscape personality

Geographically, most of Egypt is situated in Africa, culturally it is intertwined with Asia; climatologically it is a part of the Mediterranean; and hydrologically, it is one of the nine Nile riparian countries sharing the same watershed. Some anthropologist view Egypt as Pharaonic, while others see it as Arab. Most historians consider Egypt the heart of the Arab world, the seat of learning for the Islamic world, and the cornerstone of Africa. Egypt had already over 3000 years of history before it was conquered by Alexander the Great in 332 B.C. That marked the beginning of an era of foreign domination that lasted until 1952 (54).

Researchers have always wondered about the secret behind Egypt’s survival against the invasions of more than 50 foreign armies and in spite of many floods, famines, and droughts throughout its recorded history (55). Hamdan, a prominent contemporary geographer, concluded that the key lies in the synergy among three major dimensions: its strategic location, its landscape resources, and its remarkably homogeneous but resilient people (56).

Tolerant as they may be to other surrounding cultures, the Egyptians also had to tolerate the powerful natural environment that surrounds them. Throughout their long history the Egyptians

have lived with two natural determinants: the untamed river and the harsh desert. Paradoxically, the Nile represented to them both their lifeline as well as a source of recurring natural disasters. The desert represented the limiting wilderness, the route of foreign hostilities, and the land of death (57). The Pharaohs lived along the Nile and were buried in the desert. Until today, Egypt has maintained the same pattern. Over 96% of the population live on 5% of the country's territory along the river, and the rest are sparsely scattered across Egypt's landscape. These two historical constants, i.e., the untamed river and the harsh desert have kept that nation always challenged and noticeably focused on its aims. This may explain why a contemporary planner researching the Egyptian landscape usually ends up having more subjects that interest him than merely a typical inventory of existing ecosystems. Werkmeister, for one, has noted:

First of all there is the question of agriculture; here it can be seen in all variations, from the age of the Pharaohs' through to the 20th century. There is also the problem of desert reclamation to become acquainted with; the fundamentals of physical planning, old and new settlement patterns and the social background for new urban developments must all be understood (58).

Against this background, one may detect the themes behind most human actions on the Egyptian landscape. They seem to be grouped around two general goals: taming the Nile and adopting the desert (Fig. 5.5).

5.4.2 A 6000-Year Goal

For over 6,000 years, taming the Nile dominated political structures, social activities, economic organizations, religious beliefs, and almost every other aspect of people's life. History records indicate that King Mena united Upper and Lower Egypt (about 3100 B.C.) for one basic reason-- control of the Nile waters. Planning for water use in Egypt during that period had the following objectives:

- to control the river
- to protect against large floods
- to meet agricultural needs through securing seasonal storage
- to provide navigation for the longest possible periods (59).

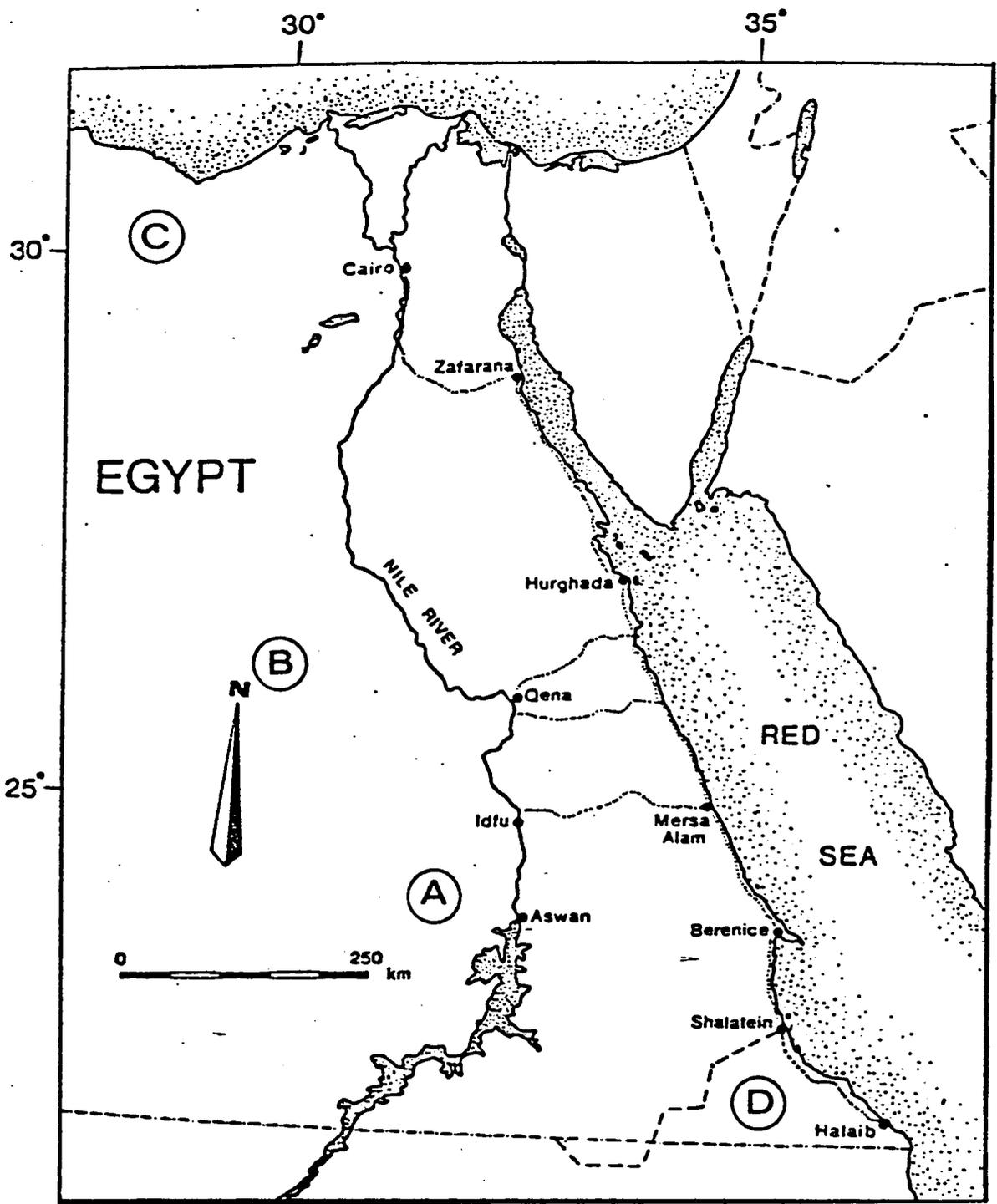


Figure 5.5 Map of Egypt showing the location of:
 A. The Aswan High Dam B. The new Valley
 C. Qattara Depression D. Jebel Elba

Source: Goodman (Ed.), Jebel Elba Conservation Areas

Starting in 1820 A.D., an overall chain of canals, barrages, and reservoirs were constructed to provide growing regions with potable water and to insure attaining the abovementioned objectives. The only new kind of objectives that was added throughout 5,000 years was "to produce hydropower needed for modern life". This may be classified as "innovation objective" according to the action-oriented objectives typology (See Chapter Four). With negligible local rainfall, all food production in Egypt was the result of irrigation. Even with the chain of irrigation projects constructed in the 19th century, there could be only one crop per year in most parts of the Nile River Valley and it was of variable quantity. The goal, i.e., to control the Nile, continued to be on the top of the national agenda, yet the specific objective kept changing. In 1902 the first Aswan Dam was built with one billion cubic meters capacity (800,000 ac-ft). It was heightened in 1912 and again in 1933 to hold five billion cubic meters (4,000,000 ac-ft) (60). All these efforts did not achieve the ultimate objective, i.e., to allow perennial irrigation to the whole country, and hence two to three crops each year. To accomplish this objective, in 1959 construction of the Aswan High Dam, south of the Old Aswan Dam was initiated. The story of that project presents an illuminating lesson for developing nations attempting to set their objectives and to avoid problems of objective contamination, or objective blindness, or objective overload (61).

5.4.3 The Aswan High Dam

Upon gaining actual independence from Britain in 1954, Egypt embarked on a very ambitious national development plan, among which constructing the High Dam was one of the objectives adopted by the Government. Obsessed with the dreams of industrializing the country, electrifying the rural regions, and channelling the water surplus of the annual flood to irrigate and reclaim the desert, Egyptian leaders gave little or no attention to ecological, natural, and cultural resources that were to be adversely affected.

In mid-1956, the World Bank questioned the economic feasibility of the High Dam and consequently withdrew its financial support for the project. This, of course, created an inflamed political

climate which distorted the assessment of that project. As the political atmosphere deteriorated, the objective blindness became more acute. The sequence of events finally reached its climax in October 1956 when Britain, France, and Israel invaded Egypt. The Suez War was launched in retaliation against President Nasser's decision to nationalize the Suez Canal company and direct its revenues toward financing the High Dam project. By the end of this episode, constructing the High Dam had become an emotional objective for the Egyptian people, leaders, and development planners. For the 15 years to follow, the whole country mobilized its resources toward that objective as it became a symbol of national pride. Ultimately, the project was completed in 1971 and the ecology of a whole region was changed forever. Suddenly, Egypt's 6000 year old goal vanished.

The Nile was finally tamed. One author writes:

The Aswan High Dam permitted conversion of submersion irrigation basins in upper Egypt to perennial irrigation, increasing irrigated area significantly, bringing electricity to the villages, and changing village life. The Nile was completely controlled (62).

However, below the surface of this remarkable achievement, an ecological time bomb was ticking. As usual, wherever humans attempt to interfere abruptly with the balance of their natural environment, they push its delicately integrated systems into disarray. Unfortunately, there is hardly anywhere else in the world where the complicated web of natural systems has been subjected to such far-reaching, adverse impacts as have taken place with the damming of the Nile at Aswan. Since that time, the argument on the pros and cons of the High Dam has never ceased. In the mid-1970's the controversy reached a serious juncture. The Egyptian Parliament seriously debated the feasibility of demolishing the entire mega-structure to restore the initial ecological state of the region.

5.4.4 The outstanding goal

Throughout all these centuries and struggles with the life-giving river, the desert remained almost untouched and untouchable. It symbolized no more than potential dreams for future generations to challenge or tackle. As a nation, perhaps Egypt misses the main goal that united her to/and against the river. Today, however, Egyptians appear to be reluctant or unwilling to rally around

the second major goal, i.e., adopting the desert or adapting to the desert. The country's continuing development difficulties may be directly related to its hesitation to move toward the desert. Paradoxically however, the problems of the neighboring arid Middle Eastern countries like Saudi Arabia, Jordan, Kuwait, Abu Dhabi, etc., are due to their moving away from the desert.

Slow as it may be, most of the major urban development and landscape planning efforts in Egypt today deal with desert regions. For example, the four sites which have already been declared as natural protected areas (Mahmiat Tabi'ia) are all located in arid regions. They are: Ras Muhammad in southern Sinai, Bardawil in the coastal desert of Sinai, Al-Omeid in the northwestern coastal desert of Egypt, and Jabal Elba in the southeastern tip of the eastern desert of Egypt (63).

As far as urban development is concerned, major efforts are being made to relieve overcrowding in Cairo and Alexandria. The former has more than 12 million inhabitants and is still growing at the rate of 4.1% annually, while the latter has grown to over 3.5 million (64). To relieve this explosive urban growth, seven new towns were proposed and have been gradually implemented during the last decade, all of which are situated in the desert regions around Cairo. They are: El-Obour, 10th of Ramadan, Badr, El-Amal, 15th of May, 6th of October, and Sadat City.

In terms of desert reclamation options, the New Valley region in the Western Desert is considered Egypt's land of promise. The recent discovery of reservoirs of abundant underground water south of its five larger oases has made this region a suitable target for landscape reclamation projects (65). In 1981, a National Five-Year Development Plan called for the reclamation of 123,000 hectares (500,000 acres) to expand the desert agriculture in that region.

Harnessing abundant solar energy has always been an occupation of arid region societies. In the late 1970's, the Egyptian government authorized an interdisciplinary planning team to conduct the necessary feasibility study and design work on the long-awaited Qattara Depression project, the first hydro-solar power project in the world. In a way, the project represents a pioneering step towards

harnessing the desert frontier. The Qattara depression is about 80 kilometers (50 miles) from the Mediterranean and an equal distance west of the Nile. It is a vast bowl in the western desert of Egypt that descends to as much as 122 to 152 meters (400 to 500 feet) below sea level. The idea is to dig a canal through the sand and rocks letting the water of the Mediterranean fill up a lake which will cover 116,000 sq. km (4500 square miles). The flow of salt water will then be adjusted to the rate of evaporation of the newly created lake. The objectives of this project include: a) the generation of 6000 megawatts per year of electricity, b) the inducement of rain, c) moderation of continental heat (with obvious impact on livestock ranching), and d) enhancement of such activities as fishing, recreation, and mining in the middle of the inhospitable western desert of Egypt.

Last, but not least, the Sinai desert, largely a barren, unspoiled peninsula with a small population, presents a multiplicity of opportunities to Egypt. One can characterize Sinai's future as uncertain or as full of new and, in some cases, still unidentified opportunities. An array of potentials appear to await discovery and marketing. A recent study has suggested that:

The development of Sinai offers a special opportunity to preserve and protect the environment while also planning for the long-term growth and economic health of Egypt. If carefully planned, the elements of infrastructure, mineral resources and industry, agriculture, tourism, and the environment can be molded to benefit each sector and contribute to the best possible development of Sinai (66).

The following section will survey Elba Conservation Areas, one of the four declared national parks; analyze its objectives; and discuss and assess its development.

5.4.5 Jabal Elba Conservation Areas

In the area along the Egyptian/Sudanese political boundaries, one bordered by the Red Sea, is a series of mountains and islands which, for decades, has caught the attention of Egyptian naturalists and international conservation experts. These mountains express the northern limit of many Afro-tropical plants and many animals in northeastern Africa. Particularly in Jabal Elba, the biological diversity is unparalleled by any other area further north in Africa (67). The Bischarin, a local Bedouin tribe, is equally interesting but from the cultural landscape point of view. The

Bischarin is a Muslim Bedouin group of Hamitic origin who have been in this region for more than 4,000 years leading a nomadic lifestyle. Traditionally, this lifestyle was ecologically sound. Through religious and tribal dictates checks were kept on the overuse or abuse of the natural resources.

In the past decade, however, the regional scene has radically changed. New roads have facilitated access to the area by game hunters, various ecosystems have been seriously disturbed, and several animals were faced with potential extirpation. Furthermore, the Bischarin culture and their traditional nomadic ways of life have begun to die out. Many studies since the early 1980's recommended that measures be taken to protect this region as some form of conservation area.

A. Regional Setting

The Jabal Elba Conservation Areas are located in the most elevated part of the southeastern desert of Egypt including a region comprising approximately 4,800 sq.km. (1880 sq. miles) (68). The region can be accessed by two paved roads: the Edfu-Mersa Alam highway and the Red Sea highway. The Elba Conservation Areas, as declared by Prime Ministerial Decree No. 450 of 1986, include: a) Red Sea Islands and Mangrove Forests, b) Abroq, c) El-Deeb, and Jabal Elba (69). Elba is a region of outstanding ecological and scenic significance. It is characterized by high granitic mountain ridges intersected by wadis (valleys) and sandy plains. Major mountain groups are Jabal Abroq, Jabal Garf, and Jabal Elba which is at 1467 meters (approx. 4700 feet) above sea level. Although Elba is geographically situated in an arid region, it receives a relatively high amount of precipitation. Typically, this occurs in the form of winter rains and regular morning dews on the upper portions of Elba mountain. It is often shrouded in a mist-zone and thus is known to native inhabitants as "the mist oasis". This micro climatic condition has resulted in a very rich and diversified fauna and flora compared to other Egyptian deserts.

B. Landscape Resources

Jabal Elba and neighboring mountains are part of the southern Egyptian Red Sea mountains and the northern Etabi range. They are intertwined with deeply cut valleys that serve as a drainage system. East of this series of mountains are gently sloping plains that meet the Red Sea. Compared to other arid regions of Egypt, this region has three or four times the number of plant species. The flora can be divided into three zones: the coastal plain (Acacia tortilis, A. nubica, Aerva persica, and Balanites aegyptica), the mountain slopes (Acacia etbaica, A. Mellifera, Moringa peregrina, and a variety of small herbs, ferns, and bryophytes), and the mountain foothill (Acacia tortilis, Delonix elata, Aerva persica, and Euphorbia cuneata) (70).

The Elba site is a transitional zone between the European/Asian and Afro-tropical biogeographical regions. There are many resident breeding birds including ostrich, several species of eagles, falcons, vultures, doves, shining sunbirds, sandgrouse and rosy patched shrike. Mammals in the region include the Dorcas gazelle, sand fox, hare, wild ass, Nubian ibex, barbary sheep, carocol, and leopard in higher mountains. There are also many species of snakes, lizards, scorpions, and insects.

C. Objectives of Jabal Elba Conservation Areas

The proposed objectives listed for the Elba Conservation Areas were included in a 1985 study entitled "Natural Resources and Management Considerations: Jabal Elba Conservation Areas". The study was funded through a joint grant from World Wildlife Fund (WWF) and International Union for the Conservation of Nature (IUCN). The objectives seem to be the work of a four-member technical team which participated in an exploratory expedition in 1985. They also wrote the final report and drafted the proposed recommendations. The authors list these objectives in order of priority:

1. The region needs to be recognized by both the Egyptian and Sudanese governments, given "conservation area" status, and legally protected from over-exploitation.
2. Develop further baseline biological information on the area including both terrestrial and marine aspects of the local plants and animals with particular emphasis on ecology.

3. Permit the Bischarin to continue their present nomadic lifestyle in Jabal Elba area.
4. Inform the public of the values of the area and conservation as a whole.
5. Establish a permanent authority in the region to oversee various aspects of wildlife management, visitors needs, research and development.
6. Limit development in the core areas so as to preserve the wilderness and ethnological characteristics of the area.
7. Maintain current biological diversity through protecting of habitats and controlling of hunting.
8. Develop long term research and management strategies that will ensure the progress of the aims listed above. (71)

Similar to Asir National Park, the Elba region is a disputed territory between Egypt and Sudan and, therefore, is considered politically problematic (72). Most of the conservation efforts are carried by the Egyptians with little or no apparent participation from the Sudanese government (73). This imbalance and ambiguity in the official status may cause problems in the future. Due to the remote location of the Elba Conservation Areas and the strategic significance of the Red Sea to Egypt, the political tension across the Middle East, the continuing hostility in Lebanon, the West Bank, Gaza Strip, and Persian Gulf, and the sparks of terrorism throughout the region, they are not open yet for the public. To visit the region, one must obtain security permits from both the Egyptian authority as well as the Sudanese. Consequently, the effectiveness of the declared objectives have not been tested yet under normal circumstances, i.e., when tourists, researchers, and common people are entering and exiting freely and interacting daily.

5.4.6 Discussion and summary

The examination of five key development projects in three different Middle Eastern countries highlights the limitations of the inductive approach to setting objectives. The reviewed case studies suggest that applying this approach has resulted in sets of landscape objectives that were neither adequate nor effective.

In the case of Asir National Park, a considerable number of the declared objectives seem to be directly copied from American sources. Their suitability and effectiveness are questionable. Also, the hidden objectives of this project appeared to be more influential throughout the planning process than the declared ones.

In the case of Jubail Industrial Town, the absence of community involvement and private sector participation in the planning process has been a major point of criticism. Some scholars believe that it might be difficult to remedy such a drawback in the long run.

In the case of Al-Areen Wildlife Park and Reserve, the landscape objectives grew in a piecemeal way. They were never developed, ranked, or grouped together in one document. Although the project has now achieved many of its stated objectives, several other potentials are still unexploited. These wasted opportunities are a result of a narrowly selective view to objectives which may relate to the inductive approach used to determine the objectives of the project.

Surveying the Egyptian scene displayed yet other drawbacks that are associated with the inductive approach to setting objectives. The whole process was monopolized by political leaders in one case and by foreign and Egyptian scientists in the other. For example, local communities and non-governmental groups played no part in a major project such as the Aswan High Dam. A project that a) has cost the nation hundreds of millions of dollars, b) taken more than a decade to build, c) changed the ecology of the whole country, and d) caused a major military confrontation with three foreign powers, was never debated by the people affected or scrutinized through a democratic process. The High Dam experience also suggests that the problem of objective blindness is a direct by-product of the inductive approach of setting objectives. On the whole, it is surprising that the inductive approach to setting objectives has been so commonly used and that the planning community has tolerated its hit-or-miss results for so long.

Footnotes

1. E. Waller, *Landscape Planning in Saudi Arabia, Jiddah, 1985*, (unpublished manuscript).
2. K. Magdziuk, "Carving Out a New National Park for Saudi Arabia", *Landscape Architecture*, Vol. 70 (1980), p. 283.
3. *Ibid*, p. 284.
4. *Ibid*, p. 282.
5. Wirth/Berger Associates, *Plans and Designs: Asir Kingdom Park*, (Billings, Montana, 1977), Section I, p. 7.
6. *Ibid*, 1977, Section VII. e, p. 5.
7. A. Vincent-Barwood, "A Park for Asir", *Aramco World Magazine*, Vol. 31, (1982), pp. 22-23.
8. Waller, p. 7.
9. U.S. National Park Service, *A Management and Development Plan for the Asir Kingdom Park*, (Washington, D.C.), 1976, p. 4.
10. Editor, "The Red Sea Nature Park", *Middle Eastern Building Construction*, May 1984, p. 304.
11. T. Eigeland, "Saudi Arabia", *The Lamp*, Spring 1976, pp. 1-11.
12. Ministry of Information, *Gulf Cooperation Council: Toward New Horizons*, (Kuwait: G.C. Press, 1984), p. 36.
13. W. Ochsenwald, "Saudi Arabia and the Islamic Revival", *International Journal of Middle East Studies*, Vol. 13, 271-286, 1981.

The Asir-Jizan region has been, for decades, a disputed territory between North Yemen and Saudi Arabia. The matter has not surfaced as a serious issue between the two countries since the 1932 war between them when Yemen was a Kingdom ruled by reactionary Imams. After the 1962 military coup, Yemen was declared a republic and a bloody civil war immediately broke out. Saudi Arabia heavily supported the overthrown Royal family and their followers against the new military regime which was receiving unqualified support from Egypt. The war continued for five more years during which an army of about 100,000 Egyptian soldiers was stationed on the Yemen-Saudi borders.

Some political analysts in the Arab world suggest that establishing Asir Park was one of many calculated moves the late King Faisal had initiated after he gained power. The Saudi clergymen

decided that the former incumbent King at that time was unable to carry out the affairs of the state, they judged that situation as a grave one and could lead to civil strife and chaos. Faisal then became King in 1964 in the midst of the civil war in neighboring Yemen. Faisal had many far reaching strategies in mind to deal with the crises and challenges facing this country locally and regionally. He was opposed to Nasirist, Bathist, and other ideologies aiming at the political and economic merger of the Arab states (Ochsenwald, 1981). Frequently, he accused Egypt of attempting to overthrow the Saudi government via its military presence in Yemen.

14. Interview with Mr. Ronald Cooksy; Chief Landscape Planner, Office of International Affairs, U.S. National Park Service, Washington, D.C., August 28, 1987.
15. A telephone interview with Mr. Kenneth Magdziuk; Landscape architect with Wirth/Berger, Billings, Montana, May 14, 1984.
16. Ochsenwald, p. 284.
17. S. Hamed, "The Islamic Garden", Unpublished Paper (Blacksburg, VA., VPI & SU, 1986).
The traditional Islamic Garden is characterized by certain features and has been influenced by several concepts. Among these concepts are:
 - Variety: Constant interplay between the real and the ideal, between the physical and the metaphysical, and between the tangible and the symbolic.
 - Multiple Use: The typical Islamic garden of the past was simultaneously a flower garden, kitchen garden, and orchard all in one. Producing food side by side while displaying beauty and accommodating leisure activities is a multiple use character that has been lost throughout the centuries.
 - Equilibrium: In contrast to the profound dichotomy of European design thinking represented on one hand by Le Nontre in France and on the other by Capability Brown in England, the Islamic garden betrays an equilibrium of rational and the natural forces. In appropriate compositions where each one supplements and enriches the other, the traditional Islamic garden echoed the Quranic teaching of "Indeed, we have created you a middle nation".
18. Cooksy, 1987.
19. Ibid.
20. A. Taylor, "The Jubail Superproject", Time Magazine, Vol. 20, July 12, 1982, p. 58.
21. D. Koester and S. el-Dossary, "The New City of Jubail, Saudi Arabia", Public Management, January 1983, p. 20.
22. International Bechtel, Inc., "Jubail", Bechtel Briefs, June 1976, p. 3.
23. H. Hambleton, "The Saudi Arabian Petrochemical Industry", in State, Society and Economy in Saudi Arabia, Tim Niblock (Ed.), (London: Groom Helm, 1982), p. 274.

24. Saudi Business and Arab Economic Report, February 1980, pp. 31-34.
25. Hambleton, p. 238.
26. Waller, p. 45.
27. International Bechtel Inc., Saudi Arabian Eastern Industrial Complex, Vol. 4, 1977, p. 5-1.
28. Waller, p. 44.
29. International Bechtel Inc., p. 52.
30. R. Nyrop et al., Area Handbook for Saudi Arabia, 3rd ed. (Washington, D.C.: U.S. Government Printing Office, 1977), p.299.
31. M.A. Abdel-Latif, "Modern Desert Settlements: Requisites, Resources, and High Technology", College Station, Texas, 1985, (Ph.D. Disscrtation, Texas A&M University), p. 99.
32. Ibid, p. 101.
33. Interview with Mr. I.H. Gomma, Former Senior Engineer with Bechtel International Inc.: Jubail Office, September 20, 1987.
34. Waller, p. 48.
35. Gomma, Sept. 20, 1987.
36. R.S. Islami and R.M. Kavoussi, The Political Economy of Saudi Arabia, (Seattle: University of Washington Press, 1984), p. 92.
37. Ministry of Information, Gulf Cooperation Council: Toward New Horizons, (Kuwait: G.C.C. Press, 1984), p. 34.
38. A. Clark, "In the Lion's Den", Aramco World Magazine, Vol. 36 No.1, 36-40, 1985.
39. State of Bahrain, Al-Areen Wildlife Park and Reserve, (Bahrain, Al-Areen, 1982), p. 1.
40. Ibid.
41. Clark, p. 39.
42. T. Sturgess, "All Creatures Great and Rare", Gulf Daily News , Vol. 11 No. 173, 1979.

43. Ibid.
44. M. Frings, "Nature Conservation Teaches Mankind a Lesson of Survival", The Gulf, p. 4, October 7, 1979.
45. Ibid.
46. Sturgess.
47. Interview with Mr. Faisal Izzedin, Former Deputy Director of Al-Areen Reserve, Bahrain, April 1987.
48. Ibid.
49. Ibid.
50. State of Bahrain, p. 1.
51. Clark, p. 40.
52. P.F. Hoye, "Return of Oryx", Aramco World Magazine, Vol. 33 No. 4, pp. 14-17, 1982.
53. W.G. East, Geography Behind History, (London: Nichols Pub. Co., 1948), p. 27.
54. Ibid.
55. On July 26 of that year, a military revolution under the leadership of Colonel Gamal Abdul Nasser overthrew the royal family, and two years later gained the country complete independence from Britain. Egypt was declared a republic, and for the first time in more than two thousand years, a native Egyptian, i.e. General Muhammad Naguib, ruled the country.
56. J. Hamdan, Shakhsiat Misr (The Personality of Egypt), (Cairo: Maktabat Al-Nahdah, 1970), pp. 5-15.
57. During the last two thousand years, for example, Egyptians changed their official religion three times, and their official language three times. Today, a salient feature is the ethnic, linguistic and religious homogeneity of the people, over 90% of whom are Arab Muslims of the Sunni denomination, most of the remaining 10% being Arabic speaking Coptic Christians.
58. M.H. Heikal, Khareef Al-Ghaddab (The Autumn of Anger), 2nd Edition, (Sharikat Al-Matbuat: Beirut, 1983), p. 149.
59. H.F. Werkmeister, "The Perfect Way to Tutankhamun", Garten + Landschaft, Vol. 11 (1979), pp. 833-860.

60. L. R. Berry et. al., The Impact of Irrigation on Development, (Washington, D.C.: Agency for International Development, 1981) pp. 48-50.
61. Objective contamination occurs when a society is confronted with several objectives, all of which should be handled individually. Because the objectives seem to overlap and interfere with one another, it becomes difficult to discriminate them and to deal with them properly. Objective overload occurs when there are so many objectives piled up that most are distorted and many even hidden.
62. S. Galal, "The Aswan High Dam, Egypt", Development and Environment, Vol 2 No. 3 (March 1978), pp. 6-8.
63. Ibid.
64. Egyptian Environmental Affairs Agency (EEAA), "Environmental Protection; The Egyptian Commitment", Cairo, Egypt, June 1986, 8 pages.
65. M.J. Wilkinson, "Environmental Report Draft on Arab Republic of Egypt", May 1980, National Park Service Contract No. CX-0001-0-0003, Department of State, Washington, D.C.
66. Dames and Moore, "Working Paper No. 5: A Plan for the Preservation, Enhancement, and Management of the Sensitive Natural Resources of Sinai", April 28, 1981, The Advisory Committee for Reconstruction, Ministry of Development, Cairo, Arab Republic of Egypt.
67. S.M. Goodman (Ed.), Gebel Elba Conservation Area: Egypt/Sudan , (Gland, Switzerland: World Wildlife Fund/International Union of Conservation of Nature, [1985]), p. 12.
68. Ibid, p. 2.
69. Egyptian Wildlife Service (EWS), "Mahmiat Elba Al-tabi-ai" (Elba Conservation Areas), 1986, Giza Zoo, Giza, Egypt, p. 6.
70. M. Kassas and M. Zahran, "Plant Life on the Coastal Mountains of the Red Sea, Egypt", Journal of Indian Botanical Society, Vol. 50a (1971), pp. 571-589.
71. Goodman, p. 65.
72. Ibid, p. 20.
73. Sudan has been overwhelmed for the last four years with an armed rebellion in the South, troubled relations with its neighbors including Khadafi's Libya and Marxist Ethiopia, a disastrous drought, and increasing foreign debt which is estimated to be approximately 9 billion dollars.

Chapter Six: Conceiving, Designing, and Managing a Landscape Planning Objectives System

The primary objectives of this chapter are to build an analytical framework, and to facilitate a meaningful discussion of the proposed LAPOS. LAPOS is a system that aids people in making decisions about their landscape planning objectives. The process that leads to agreeing on a set of objectives is considered, for the purpose of this dissertation, as a part of landscape planning. Controlling and monitoring the implementation of a set of objectives is considered landscape management. The major part of landscape planning is not discussed herein, because it is beyond the realm of this dissertation. It includes, among other things, such activities as landscape analysis, synthesis, and evaluation of alternatives.

6.1 The Key Questions

Just like other types of ideas and concepts, objectives require some organizational system to help in identifying, structuring, controlling, and finally communicating them to others. A proposed system for developing landscape planning objectives will, sooner or later, confront basic questions such as:

- What types of public objectives may be considered significantly relevant to landscape planning, and should hence be included? Which ones are not?

- What are the actual and proper sources of landscape planning objectives?
- How should these objectives be assessed?
- How should these objectives be organized and structured?
- Where should they be stored?
- Who would be the depositors?
- Who would be the users?
- In what way may objectives be used?
- How should the performance of the system be evaluated and modified?

This chapter addresses these questions. Also, an analytical framework for LAPOS is suggested and its conceptual processes are discussed. No treatment of mathematical models or computer applications will be attempted.

In order to achieve the most desirable output, the proposed approach in this dissertation stresses the necessity that it be planned and managed in a systematic and comprehensive manner. This is achieved through the application of some basic principles of systems theory (Fig. 6.1). Despite the common association of systems theory with computers, it is believed that there is a role for both non-computerized systems as well as computerized objectives systems.

6.2 A Conceptual Framework of the Landscape Planning Objectives System

The components of the proposed approach may be found in the solid grounds of general systems theory as suggested by von Bertalanffy and other scholars who followed his path. The proposed LAPOS includes:

- Context

The limit of the system is landscape planning within a designated region and specific population.

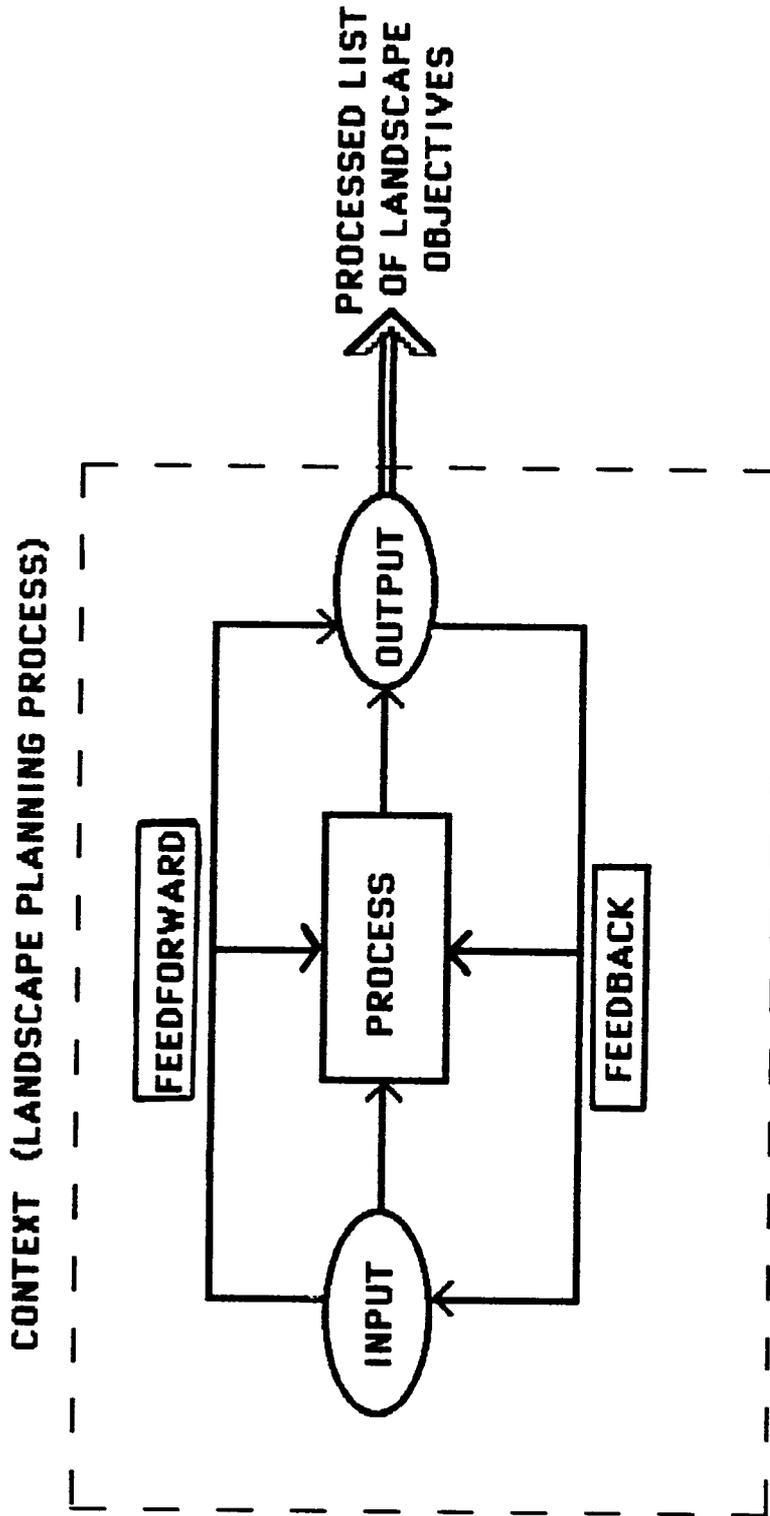


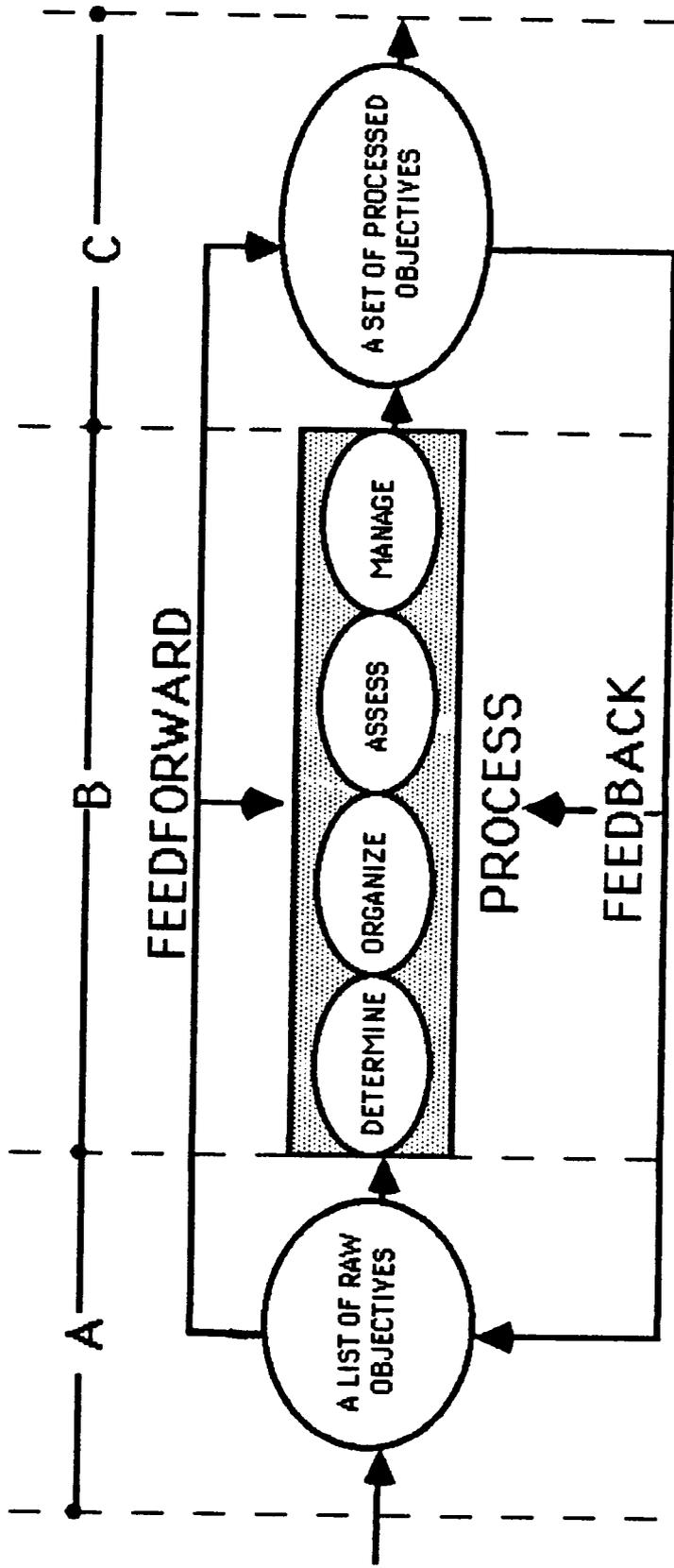
Figure 6.1 A conceptual framework of the proposed LAPDS

- **Outputs**
A set of processed landscape planning objectives.
- **Inputs**
Information, all possible alternative objectives.
- **Process**
Four related phrases: determining, organizing, assessing, and managing landscape planning objectives.
- **Feedback**
These are validating, monitoring, and adaptive processes. An effective feedback sub-system may include the use of reliability indices, determining the propriety of sample sizes and the adequacy of reporting.
- **Feedforward**
Designing to assure the present system is "most right" or maximally suitable over the long run. It is the means by which the best estimates of future conditions are brought as inputs to the system and the system is modified based on them.

All six components are interactive.

LAPOS moves through various steps and follows a definable procedure. This motion produces the intended output, i.e., a set of landscape planning objectives. This output, in turn, allows a feedback mechanism within the system to affect all parts. In subsequent cycles, necessary modification in the inputs, structure, or the process of the system are made if performance needs to be enhanced (Fig. 6.2).

For the purpose of this dissertation, the proposed system is an entity that articulates the criteria for desired futures, the elements of which are a set of landscape-related objectives. These objectives may address a whole region, an entire country, a region within a country, or a project or program within a region.



A = WHAT DO WE WISH OUR FUTURE LANDSCAPE TO BE?

B = WHAT CAN WE DO WITH OUR LANDSCAPE?

C = WHAT SHOULD WE DO WITH OUR LANDSCAPE?

Figure 6. 2 Elements and procedure of the proposed LAPOS

As defined in Chapter One, the term landscape planning suggests that LAPOS should encompass a wide range of sub-systems such as natural resources, cultural resources, landscape productivity, landscape beauty, landscape diversity, land use issues, or any project or program that may influence the relevant landscape.

The proposed model process is comprised of four main phases: a) determining, b) organizing, c) assessing, and d) managing landscape planning objectives. Each of these phases will be examined and illustrated in detail.

6.2.1 The first phase: Determining

The emphasis during the first phase of the process will be on the operations and activities involved in determining objectives. These may include the following tasks:

1. to solicit objectives already stated or included in prior works.
2. to detect objectives that seem obscure in previous work and clarify them.
3. to screen the list of objectives in terms of relevancy and credibility.
4. to write and edit new objectives.
5. to prepare the list for public forums by selecting the proper media (or language).

6.2.2 The second phase: Organizing

The emphasis during the second phase will be placed on the alternative methods of organizing objectives. These may include tasks such as:

1. to categorize objectives and classify them in a logical structure.
2. to manipulate objectives among various classification methods used in the system.

6.2.3 The third phase: Assessing

The emphasis during the third phase will be on the operations and activities involved in assessing objectives. These may include:

1. to interpret objectives.
2. to analyze objectives in order to determine all their dimensions.
3. to measure the various dimensions of objectives (i.e., space, time population, demand, marginality, and failure index).
4. to assess the weighted importance of each of the six dimensions of each objective.
5. to study interactions among objectives.

6.2.4 The fourth phase: Managing

The emphasis during the fourth phase of the process will be placed on managing objectives. This includes the following tasks:

1. to maintain a system for storing, retrieving, and manipulating objectives.
2. to monitor the use of objectives.
3. to improve continually the validity of objectives.
4. to improve continually the accuracy of measuring and communicating the list of objectives.
5. to maintain an historical record of objectives.

6.3 Designing the System

Despite the literature of comprehensive planning being replete with exhortations about the importance of goals and objectives, these topics are among the least well developed and least understood within the planning fields. Landscape planning is no exception. Most landscape planners attempt to perform activities labeled "forming strategies" or "developing goals and objectives" but few actually have developed structured approaches and effective processes for exploring the broad range of landscape objectives.

The basic purposes of the previous chapter were to survey existing approaches, identify their problems, and compare their performance. This evaluation made it evident that a need for a new approach to setting objectives still exists. The proposed LAPOS is designed to meet the following criteria:

- a. to be consistent with the definition of landscape planning as suggested in Chapter One;
- b. to be more effective and efficient than existing approaches;
- c. to be useful to the average landscape planner within the time and funding constraints inherent in most planning studies, and
- d. to meet or come close to meeting the evaluation criteria that were suggested in Chapter 3.3.

Although the approach is designed with the arid regions of the Middle East in mind, its function and organization may prove to be as useful to other regions of the world. This expanded role is most likely to happen because: a) the process of regional landscape planning always requires a systematic way of identifying, analyzing, and structuring a large conglomeration of objectives; b) each region needs a system for disseminating objectives to those who will use them in a timely and efficient fashion; and c) several development projects throughout the Third World have not achieved their ultimate potential (See Chapter Six). It is believed that these failures are partially caused by the limited attention paid to the intricate role landscape planning objectives could play

in developing of any region. The following sections describe and develop in detail this proposed approach.

6.4 The Nature of the Process

Objectives are human constructs. Since humans themselves are complex and continually changing, the process of setting objectives should be flexible and dynamic to accommodate these changes. Failing to do so could produce an obsolete system either from inception or after a very short time. Also, life involves many variables and accidents that influence the selection of objectives that people pursue in any specific time or place. Because of life's unpredictability, LAPOS includes four iterative phases. They are: determining, organizing, assessing, and managing objectives. These phases are examined in detail in the following sections.

6.5 Determining Landscape Planning Objectives

Opinion polls help set national and regional agenda by the questions they do and do not ask. Advertising, on the other hand, helps set personal agenda by the questions it induces everyone to ask of himself or herself. But are these satisfactory means to determining landscape objectives? Most likely, they are not.

6.5.1 The basic premises

Objectives are not discovered. They are created by individuals. Articulating them is one of the most human of acts. While most elements of the landscape are subject to the human explorations of root-causes and primal sources, this part is not yet subject to such studies (1). Objectives are

not significantly influenced by national agenda or commercial advertisement. They are very personal subjective.

Determining objectives should start with two key and simultaneous questions: a) what are the problems, and b) what are the dreams? Design theorists believe that common people choose among known objectives, but talented planners and visionary leaders produce novel objectives. This belief suggests that the task of determining objectives may benefit from a joint effort by both groups, i.e., the ones who perceive or experience a problem and the ones who conceive and envisage a dream. A primary role of the proposed LAPOS is to facilitate contacts between the two groups and all other people interested in a region and its future. In addition, LAPOS provides a forum for their interaction to occur efficiently and continually.

Just like all other research endeavors, determining objectives is governed by the availability of relevant raw data (written/recorded objectives). Therefore, it is important to develop an exhaustive list of regional objectives before proceeding to the next tasks. Of course regions do not have objectives, only humans do. They have them for their families, communities, or investments. They seem to have them, but only a skilled observer could write them down in a form suitable for communicating them to others. Objectives have to be written sooner or later as they exist at some time. These may then be compared with the perception of others. However, there seems to be a problem with the way most people think about objectives: they do not tend to take the first logical step first, i.e., articulating them. Usually, they rush to take the subsequent step which involves processing of what they have already perceived. In order to enrich the contribution of many participants to this phase, they should be encouraged to look at the world in wholistic way (2). This requires that each objective be screened.

A screening process requires people to direct their attention to the Gestalt field of experience.

Looking at a region from different perspectives and through different experiences may increase significantly the probability of perceiving new issues and perhaps generating new objectives. Since

there is no way of knowing in advance where or when a significant objective might be added, the effort of expanding the inventory of raw objectives should be an on-going affair.

6.5.2 Screening public objectives

Of course, landscape objectives should not be incorporated in this phase or into any other phases of LAPOS simply because they are available. Objectives must be relevant to the defined scope of landscape planning and the perceived need for a particular region. This linkage is particularly significant to the search for valid objectives. For example, preserving unique landscapes, conserving natural resources, and adhering to ethical obligations toward future generations are all commended ends. The same objectives might be unwise to attempt unless the people, or a large number of the population, are truly committed to these directions. Therefore, it is suggested that each objective be screened.

A simple screening process involves a great deal of judgement by landscape experts. It is based upon the very definition of landscape planning (See Chapter 1.6). The primary task of landscape experts in this phase is to monitor and control the input of objectives. They seek to have the system contain only those objectives which deal with: a) natural resources use, b) cultural resources use, c) landscape productivity, d) landscape beauty, e) landscape diversity, or f) land use allocation. Any other objectives would be considered relevant to other types of activities of comprehensive planning and development and, hence, not be further processed through LAPOS.

6.5.3 The central office of public objectives

Some people may argue that the screening criteria are too vague or general. This concern may be minimized by setting up a central agency, office, or authority in the region for soliciting, detecting, writing, determining, and preparing public objectives. This proposed central office should be staffed

by qualified multi-disciplinary experts in the six different areas of landscape planning. The team would be responsible for facilitating the various tasks involved with the four phases of LAPOS process, for setting the screening criteria, for refining the screening procedure, and for determining the optimum dissemination method of each objective. The secondary duty of the Central Office of Public Objectives includes identifying key regional landscape problems and potentials. This may be achieved by keeping track of suits filed in courts, bills introduced in legislatures, and objectives prepared in past studies or for other regions. The third responsibility of this central office is to facilitate community participation and to establish a public forum for discussing the output of the four phases. The notion of public participation in the task of generating objectives raises the question of who would contribute to the proposed public forum and who would participate in LAPOS?

In his search for humankind's long range goals, Feinberg describes a public forum that is similar to the one suggested here (3). His concept involves four steps: a) to convince a sizeable number of people that the search for goals is both essential and possible, b) to ensure the involvement of those who would not ordinarily think about abstract issues, c) to create specific forums for the public to discuss their views about goals with one another in order to get some indication about the existence of a consensus, and d) to insure a more thoroughgoing consideration of the goals that have been generated. Proponents would produce a detailed statement explaining how they envisaged the goals, why they considered them worth pursuing and some idea of how to go about it. Feinberg calls for establishing a worldwide coordinating agency that would promote various kinds of discourse until it could announce to the world what the long range goals of humankind might be. Although Feinberg's concept is stimulating, some of his ideas appear non-operational and others seem vague. Nevertheless, he has identified several useful points about setting public objectives. These are:

- Raising a debate about what ought to be and establishing priorities for each case are two activities of utmost importance to the planning efforts of every society.
- It is essential to allow and encourage people's involvement in every public objectives debate.
- In public forums, it is vital to observe, and perhaps detect, what people consider good and worth preserving or improving in their lives, and what they think should be eliminated or modified.

- It is helpful to conduct debates among heterogeneous groups since homogeneous groups are too likely to limit themselves to the consideration of objectives that are of interest only to their group (4).

The significance of involving all groups of a society is not a mere concern for democracy or social justice. Rather, such group action is a mean to make the list of public objectives a comprehensive one. Lists of public objectives are similar to data banks, information systems, and libraries in which the number of inputs is a key criterion for their success. Churchman has examined this analogy and writes:

One aim of the traditional library is to collect documents of various kinds, books, articles, maps, etc. and so to identify the collection that an individual who wishes an item from it can retrieve it 'successfully'. The measure of performance of the system may be given in terms of the size of the collection and the ability on the part of a user to retrieve a document from the collection (5).

Although most planners seem to support the notion of having a large number of objectives listed, few prefer other means than depending on increased citizen involvement. Huntington, for one, warns against public participation:

Some theoreticians hold that the higher the degree of citizen participation in planning, the greater the degree of dissatisfaction with planning outcomes (6).

It should be pointed out that the above skeptical statement was written in 1975 when the whole concept of public participation was in its infancy. Much has happened since then in terms of improving the methods and training and personnel to conduct these tasks. This is not to underestimate the significance of carefully defining who should be the participants and the conductors of the process. Objectives need to come from responsible people and representative groups. The literature review revealed some 60 community involvement techniques for securing public objectives. Although they may or may not be all used directly in LAPOS, they are very useful to the activity of determining objectives. These techniques include: Community Sponsored Meetings, Workshops, Policy Delphi, Scenarios, Attitude Surveys, Task Forces, Citizens' Advisory Committee, Fishbowl Planning, Public Information Program, Arbitrative and Mediative Planning, Coordinator or Catalyst, Advocacy Planning, Planning Council, Community Technical Assistance, Open Information Meetings, and Hotline (7). The decision to use one or more of these techniques will depend primarily on the nature of the region and on the planning team's judgement of the project's circumstances. The most influential force in this decision should be the capacity of the selected

technique to increase the probability that all relevant objectives will be in the system. Herein lies the significance of grounding LAPOS in the general systems paradigm. As with most other design professionals, landscape planners are constantly searching for alternative processes and outputs for their activities. Determining landscape objectives according to the systems approach is not narrowed merely to selecting an objective from an available list. Rather, it simultaneously involves selecting among known objectives, disclosing hidden ones, and generating unknown objectives.

6.5.4 Sources of objectives

The ultimate source of objectives is the human mind. The literature review suggests that the search for objectives must be a team effort even though formulating ideas is usually carried out by individuals. A question, therefore, is: Which individual? Some authors believe that individuals will not qualify simply because they are intellectuals, or holy men, or politicians. Instead, they claim valid participants have only the characteristic of being interested citizens. Eckbo notes the problems involved with the marketplace as a mechanism for recognizing the needs and objectives of the entire population:

Consumers cannot demand qualities or amenities of which they have never heard. Scientists and artists, designers and technicians are, perhaps, the only people able to conceive and produce new qualities and amenities, do not participate in the discussions of the marketplace except as employees of the producers. Thus there is not opportunity for creators to tell consumers what they might have so that they can demand it from the producers, even though it does not now exist (8).

It is proposed that LAPOS draw its data from three sources: a) in part from the "outside" world and from the people; b) internally, from government systems and from permanent documents containing the publications produced and collected about the community objectives; and c) from the research conducted by the proposed Central Office of Public Objectives which employs scientists, landscape planners, artists, and other technical experts.

Most planners seem to believe that the best understood and most easily developed part of any objectives system is the list of internally generated objectives, i.e., those objectives obtained from sources within the local government in the region. However, little attention has been devoted to

the more difficult task of systematically developing objectives external to the local authorities, especially those national and international. Obviously, external forces play an important role in determining the future of a region. The bias in favor of internally-oriented objectives is natural and easily understood. Internally-oriented objectives are easier to obtain since they are often routinely collected and reported to the central government. However, good planning should be based on, among other things, a contrived and dynamic set of objectives, rather than the simple reaction to evolving local circumstances. Effective landscape planning approaches, therefore, must create the opportunity for decision-makers to gain access to the global context of objectives. This is a very difficult task since landscape planning or landscape policy making at the international level is very limited. Fabos, for one, has discussed this issue:

Global land-use policies to guide growth-related, population maintenance, decline, and reclamation issues are practically non-existent. The formulation of policies to guide the resource exploitation of the world, preservation of significant landscapes, and the minimization of global land-use impacts are only in their initial or formative state (9).

In addition to drawing upon external sources, internal sources, and the work of a central office to compile public objectives, the proposed Central Office of Public Objectives' multi-disciplinary team may develop and apply techniques for enriching the compiled list of objectives. For example, Simon suggests four directions:

- Change the way an objective is stated
- Look at the objective from a different perspective
- Review alternative objectives periodically
- Review alternative objectives at critical points of the planning process (10).

6.5.5 Preparing the list for public forums

Successful development of landscape objectives requires that they are accurately formulated and clearly communicated. Having a list of objectives and communicating it to or sharing it with others

are hardly the same. Kaplan, for one, raises serious concerns about communicating people's objectives during the planning process:

To ask people what they want or why they want it is in many instances unproductive and frustrating. Our inability to explain things that are important to us seems surprising. The basis of much experience, even for humans, is not verbal (11).

Consequently some may suggest that: a) in the case of many landscape projects, the use of visual material to elicit the responses is particularly useful, and b) on the whole, lay people need some sort of assistance in stating their ideas, wants, and aspirations. One key role of the Central Office's team is to do just that; to select the media (or the language) of communicating objectives and to assist the public in articulating their ideas. This must be artfully done, for the intent must be to elicit the fullest and truest expression of citizens. The possible substitution of a planner's objectives for those of a citizen's is a danger to be avoided. Also, more research work is needed by the Central Office of Public Objectives on the physiological and psychological states and other factors that influence the statements and the comprehension of objectives by people. In order to be sure that all objectives are stated in a meaningful, precise way, Giles has proposed that each list of public objectives must be judged against a set of criteria (12). He suggests that a list must be stated so someone observing the implementation can be convinced that each objective is (or is not) being achieved and to what extent.

In brief, devising criteria for developing and evaluating statements of public objectives is the duty of the central office of public objectives. These may include, but are not necessarily limited to, the following criteria:

- The public objectives statement has been prepared for the proper audience.
- It has used the most suitable language for the context (i.e., words, numbers, or graphics)
- It is grammatically correct
- It is brief
- It can be understood by a reasonable number of people in the community
- Progress toward it can be measured
- There is at least one way known or imagined in which it can be achieved

- Acceptable units or measures of attainment can be agreed upon
- It cannot be combined with another objective.

6.6 Organizing Landscape Planning Objectives

Humans live in and are part of an organized universe. All the impressions that they receive, all objects which they learn to recognize, and all their ideas have organization as a constant and essential characteristic. "To organize" means to arrange the several parts for action or work, to structure carefully for a special purpose, or to put together something to form a more complex thing. A typical problem with developing public objectives has been that they were often listed, and that was the end of the operation. It is not surprising, therefore, that some people have been dissatisfied. The trouble of the past involved lack of clarity of how to order objectives, and insufficient knowledge about the alternative ways to structure them. It seems that it may be easy to state an objective that has the ring of importance, but it is much more difficult to structure a list of objectives in some purposeful hierarchy.

In the previous phase, i.e., determining objectives, efforts have been made to enlarge the amount of input and to maximize the number of sources of raw objectives (13).

In this phase, i.e., organizing objectives, efforts are focused on generating and developing alternative logical ways for grouping.

6.6.1 Overview

Societies are too complex to have only one objective. They have a set (a list) of objectives. This list may be composed of various parts or sublists. Sublists provide an organized framework for

analysis, synthesis, assessment, and decision making and, thus, allow objectives to serve their ultimate function, i.e., as rules for choice among alternative actions.

A systematic method for structuring landscape objectives into various sub-lists may make easier the hard choices a decision-maker must make. Ultimately, it may help to insure that they are not made in ignorance of other related needs, wants, and aspirations of the society. Furthermore, the massive diversity of landscape objectives (14) calls for some kind of practical grouping. While the task of developing a 20 page list of objectives could be accomplished relatively easily (say within several work-weeks), most planners find that identifying such things as the 10 to 15 most important landscape objectives -- among hundreds in the same list -- to be a very difficult task. Such a task may involve participants in simulating various interests and points of views and, thus requiring intensive analysis, extensive negotiation, and making many difficult judgements. Potentially, this list can affect the choice process and the vested interests of the various participating groups of the society. It may be hard to imagine fully or assess satisfactorily the regional impact of such a list.

Various methods of classifying landscape objectives have been attempted by some authors. However, an agreed-upon typology of landscape objectives (or any kind of objectives) does not exist. The relevant literature has revealed six ways to list and group objectives. They are: significance, temporal, spatial, action, realm, and sector-based methods.

6.6.2 Significance-based methods

Grouping objectives in one set or storing them in one system does not mean that they all are equally compelling or important objectives. People rally around an objective for a variety of reasons. Since humans have a variety of needs, problems and/or dreams, it seems logical that they would concentrate on some of them before even thinking about the other. According to Maslow, humans seek to satisfy these needs or desires in a certain sequence. He classifies needs into five types, in ascending order: physiological, safety, belongingness and love, esteem, and self-

actualization needs (15). As shown in Figure 6.3, physiological needs (or objectives) must be satisfied first, after which safety needs become prominent, and so forth.

A few other methods similar to Maslow's have been suggested. For example, the international development agencies have recently used the concept of Survival first, then Development and Quality of Life. The common phrase "Today's fulfillment is yesterday's development and tomorrow's survival is today's development" adds the time dimension.

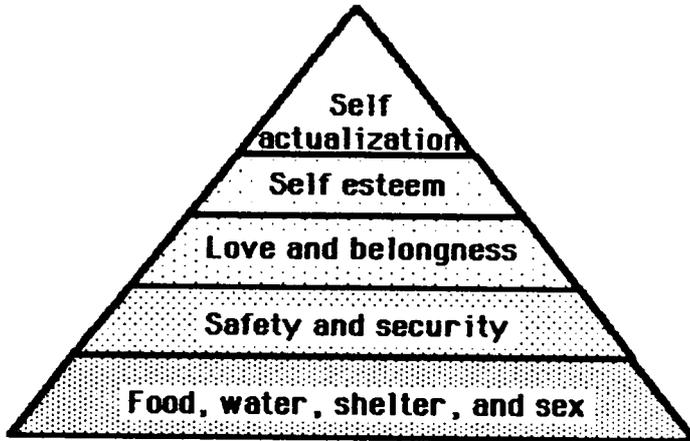
In another example, Tolba has suggested the typology of human needs, human wants, and human aspirations (16). Needs refer to food, water and shelter; wants refer to health, growth, and movement, and aspiration refer to cultural heritage, human rights, and a sense of belonging (Fig. 6.4).

Finally, Muslim jurists realized in the past that the real challenge before them was to provide acceptable criteria by which to judge between conflicting objectives and to weigh societal benefits and costs. This was once articulated by Ibn Taimiyya, the prominent Muslim scholar, in 1328 A.D.

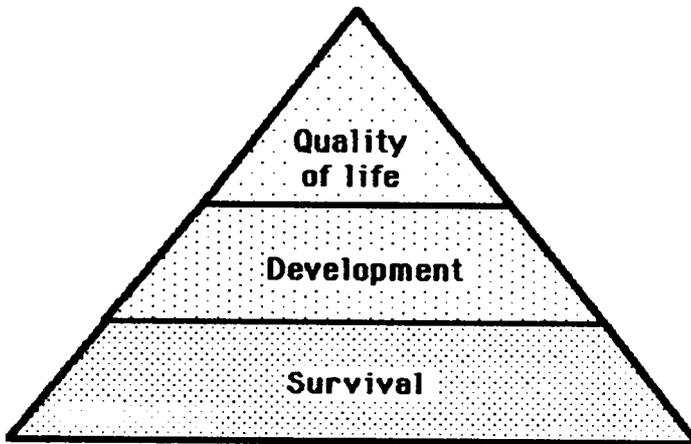
What is required is to safeguard all benefits and bring them to perfection, and to eliminate all evils and minimize them. And if they are irreconcilable, it is to safeguard the greater good by the exclusion of the lesser, and to remove the greater harm while bearing with the lesser (17).

Accordingly, Ibn Taimiyya and many of his colleagues have developed a system for public objectives that was based on Shariah (Islamic Law). His three dimensional typology assigns priorities to the most significant public objectives. Absolute necessities such as human life, offspring and family, reason and mental health, and private and public property have the highest priority. Lesser wants follow, and last are refinements and luxuries such as aesthetics and recreation.

Significance-based methods have been developed by many societies and in various fields of knowledge. The above typologies appear to be more advanced and carefully-thought sets than others. They tend to be tuned to the cultural aspirations and the social systems upon which they were initially created. However, they are not always easy to generalize in time and space.

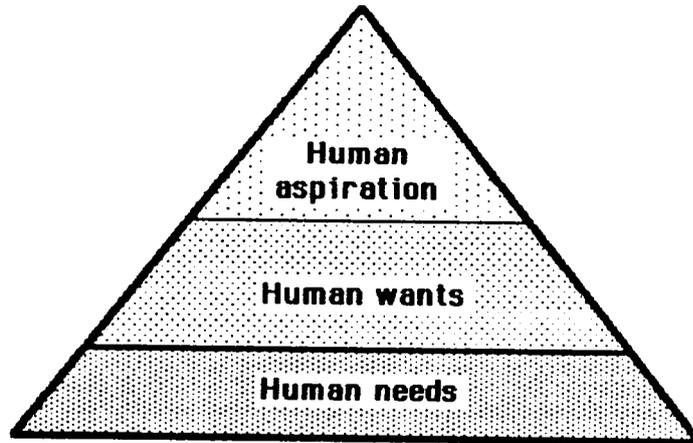


a) MASLOW'S NEED HIERARCHY



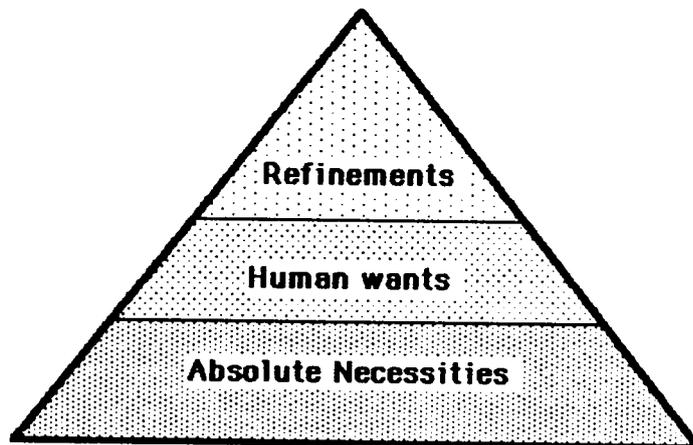
b) INTERNATIONAL DEVELOPMENT AGENCIES HIERARCHY OF OBJECTIVES

Figure 6.3 Significance-based methods of grouping objectives



a) TOLBA'S TYPOLOGY OF HUMAN OBJECTIVES

- Human aspirations refer to culture, human rights, and a sense of belonging
- Human wants refer to health, growth, and movement
- Human needs refer to food, water, and shelter



b) IBN TAIMIYYA'S HIERARCHY OF PUBLIC OBJECTIVES

- Refinements include aesthetics and recreation
- Human wants include health, education, and freedom
- Necessities include human life, offspring, and mental health

Figure 6.4 Significance-based methods of grouping objectives by two Muslim authors

6.6.3 Temporal-based methods

Time is an inherent component of all activity. Landscape planning seeks to affect the future by present and proposed actions. However, there is rarely enough time, not to mention sufficient knowledge or adequate resources, for landscape planning to “do everything.” Priorities have to be determined, i.e., sequences established. Some planning theorists, therefore, generically classify human objectives into three types: long-, intermediate-, and short-range planning objectives.

The temporal classification of landscape objectives is quite appealing. Because a regional landscape is such a slow moving system (relative to a landscape planner’s career years), it is logical that long-term objectives must be formulated and maintained simultaneously with intermediate and short-term objectives. Such sets of objectives can provide transition between landscape planners, minimize loss of data and information, reduce duplication, and maintain a balance between the advantages of pursuing an objective for 10 years or more and the advantages of applying a new idea during the current year. They can also provide an impetus for discarding or changing the priority of existing policies. In addition, temporal-based sets recognize that the landscape of a region will undergo transformation while attaining the society’s goals. Therefore, specific objectives are needed for each of the time zones through which the landscape system may pass. This differs from traditional site planning practices which tend to project objectives in terms of present trends, attitudes, and capabilities without allowing for significant changes that may occur (18).

6.6.4 Spatial-based method

The interaction of biophysical, political, and socio-economical systems within a geographical area produces a unique landscape. There also seems to be a link between landscape characteristics and the public objectives in a given region. Simonds, for one, has suggested that for every site there is an ideal use, and for every use there is an ideal site (19). Based on his concept, an ideal plan is one

in which human objectives are conceived in awareness of the highest potential of the landscape and in which both are interactively realized and synthesized. Unsuitable landscape factors are modified, ameliorated, or eliminated. Positive regional landscape factors are developed, extended, and accentuated. Basic to all these activities is the recognition of the idea of the region as a constellation of systems. Not only do these systems have to be surveyed and analyzed, but they also must be moved as separate components, and as a whole constellation of systems, towards an agreed upon set of public objectives (20). Furthermore, landscape objectives themselves may be classified in different ways based on different regions of the world (Fig. 6.5). A common typology could be the climatic regions of the world. These are arid, semi-arid, tropical wet, tropical dry, sub-tropical humid, sub-tropical dry, temperate, or arctic climates. Landscape objectives may also be classified by topographical regions such as mountains, rolling hills, plains, and tablelands or by the global system of soils (21).

As an example of sets of objectives tailored for the specific conditions of climatic region, a UNESCO publication (22) and a recent book by Eckholm and Brown (23) have presented lists of "objectives" for the semi-arid regions of the Middle East. The list includes the following:

- To prevent waste in irrigated agriculture
- To regulate better the use of water in various sectors
- To promote tree planting programs as a way to help relieve the critical shortage of firewood
- To combat erosion and to stabilize the areas under cultivation
- to spread knowledge of new agriculture techniques by initiating activities among small farmers
- To prepare people and economies to live through the inevitable droughts without traumas
- to develop dry farming techniques
- To establish large farms capable of making profitable use of modern means of production
- To modernize pastoralism in order to improve animal husbandry production
- To organize the countryside by preventing a haphazard extension of cultivation and by recognizing traditional grazing rights
- To integrate pastoralism into the national economy

The following major biomes correspond to the major ecosystem groups of the world.

-  Tropical forest biome
-  Subtropical and temperate rain-forest biomes
-  Temperate broadleaf forest, woodland, and scrubland biomes
-  Temperate woodland biome
-  Boreal subarctic forest, tundra, and tundra biome
-  Tropical dry or deciduous forest (including savanna biome)
-  Tropical grassland and savanna
-  Temperate grassland
-  Pampa steppes and scrublands
-  Cold tundra (continuous tundra and tundra biome)
-  Tundra (montane and highland tundra)
-  Island mountain and highland forests with temperate forests
-  Island forest biome
-  Desert and lake systems



Figure 6.5 The major ecosystem groups of the world
 Landscape planning objectives may be classified by the fourteen major biomes of the world.
 Source: UNESCO, *Nature and Resources*, Vol. XX, No. 4, 1984

- To improve local grain reserve facilities in order to help tide people over during years of poor rainfall (24).

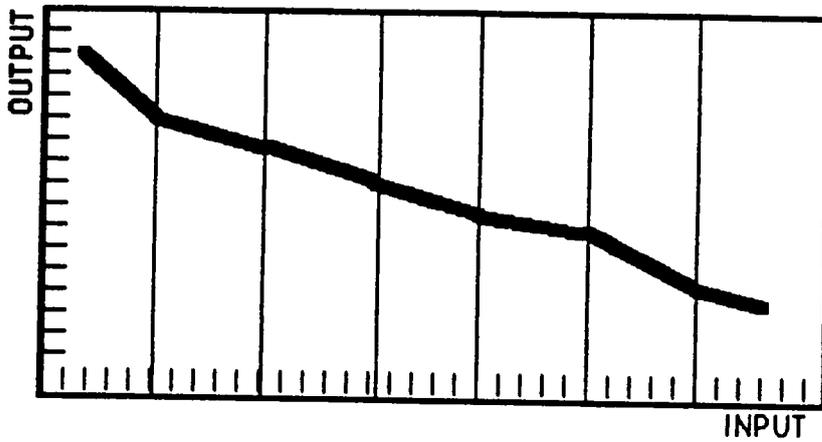
In conclusion, besides its obvious relevancy to landscape planning, classification of objectives according to regional zones or spatial relations has many advantages. Since environmental phenomena do not follow national or international boundaries, such a classification system may substantially benefit from and build upon geographic information systems. An example of these systems is the Global Environmental Monitoring System (GEMS), which has been managed by the United Nations' Environment Program. Its specific functions are to collect data and to assess environmental problems with respect to climate, oceans, human health, and renewable natural resources. Another virtue of spatial-based methods of classifying objectives is that the classes tend to build an element of continuity and coherency in the midst of the typically changing forces of the development process. The application of these methods may also enhance national and international cooperation and reduce the duplication of efforts among countries sharing the same characteristics of regions.

6.6.5 Action-based methods

Lee suggests that human objectives may be classified into various groups according to the action involved (25). They include: growth, decline, maintenance, improvement, and innovation objectives.

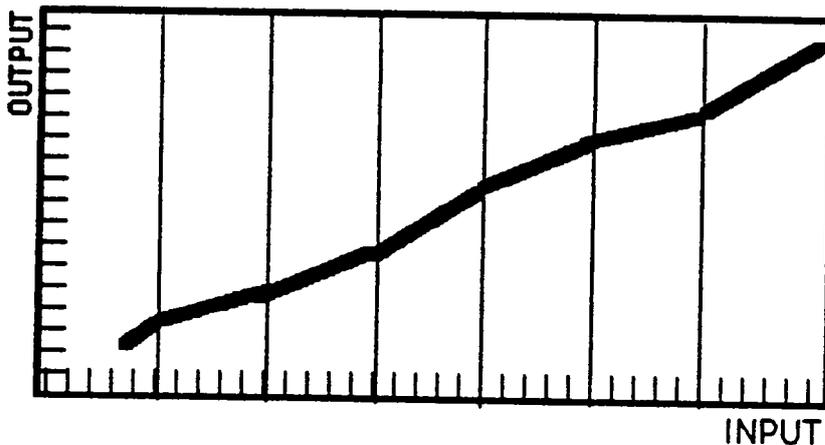
Growth and decline objectives (Fig. 6.6) imply no increase in efficiency or quality. They merely imply doing more or producing more (or less) of something.

Ecologists assert that zero growth (i.e., maintenance of status quo guided by maintenance objectives) is a good indicator of when a climax community is reached. They imply that a system has reached the appropriate level of accomplishment, is benefiting in the present, and will continue to



a) - DECLINE OBJECTIVES

Decline objectives imply no increase or decrease in the capability of a system. They merely indicate doing or producing less.



b) - GROWTH OBJECTIVES

Growth objectives imply that the system is doing/or producing more of something.

Figure 6.6 Lee's decline and growth objectives

benefit in the future...if it maintains performance. The current conditions are acceptable and thus need to be maintained at the existing level. Improvement objectives involve upgrading performance (usually benefits and costs are involved) in one area or another; that is, doing better the things which are currently being done satisfactorily (Fig. 6.7).

Innovation objectives are those for doing something new or making some basic changes in the landscape (26).

In short, Lee concludes that three generic action-oriented types of objectives exist. The first relates to quantity, the second to quality, and the third to some kind of breakthrough or innovation.

In his book Land Use Planning, Fabos presents a typology similar to Lee's (27). He outlines a list of seven items that he believed to be a comprehensive list encompassing the whole range of land-use issues. The seven issues are: growth, decline, stabilization related issues, resource utilization, preservation, reclamation, and environmental and socioeconomical impacts issues. The parallel between Fabos' issues and Lee's typology of objectives is striking.

Action-based techniques of organizing objectives seems to be a useful and simple tool. The human mind, which is believed to be the source of objectives, will probably grasp and readily remember the generic actions involved, i.e., growth, decline, maintenance, improvement, and innovation. Furthermore, being hinged to specific courses of action, such typologies would probably enhance and facilitate the tasks of articulating and assessing objectives, and reduce the chance of stating them vaguely.

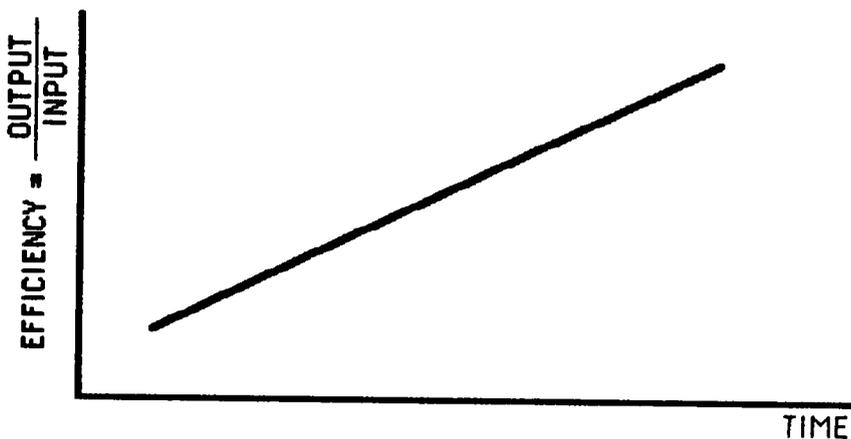
6.6.6 Multi realm-based methods

It is much easier to deal with an individual's objectives than with the public objectives. The issue of how two or more people's objectives will be determined, assessed, and managed is a challenging



a) MAINTENANCE/STABILIZATION OBJECTIVE

Maintenance objectives imply that a system has reached its climax and that the current conditions are acceptable. The need is, therefore, to stabilize the existing level of performance.



b) IMPROVEMENT OBJECTIVES

Improvement objectives involve doing better the things which are currently being done satisfactorily.

Figure 6.7 Lee's maintenance and improvement objectives

issue. Society uses various processes to create landscapes that express its values and objectives. These processes may be led by decision makers who stand at their center. Eckbo has pointed to the difficulty of representing all the facets of the society. He writes:

They (decision-makers) symbolize and represent society. The values and objectives expressed are theirs. But they are also ours, insofar as we select or allow them to determine the form and character of our landscape for us. Some of them are our official (political) representatives. Others are unofficial leaders (business, military). Decisions filter down through a hierarchy of owners, executives, entrepreneurs, administrators, superintendents, managers, foremen, draftsmen, clerks. Somewhere in the middle levels of this pyramid are the technicians and designers who represent science and art in the total process (28).

The issue here is neither a function of having various populations and species, nor a function of having different publics and groups in the society. Rather, it is directly related to the role each individual and group plays in the community. The responsibility of setting public objectives in a democratic, developed society is a diffused one. In a non-democratic, less developed society (as are most Middle Eastern countries), this responsibility is usually left unassigned or, at best, narrowly assigned. This is probably why only a few sets of objectives are consciously achieved through a methodical procedure (See Chapter Five). Instead, the sets of objectives that have been identified (in most of the reviewed case studies) seem to represent a highly valued dream of a leader or an unavoidable pressing problem of a powerful realm of the masses.

Several conventional planning sources suggested a general realm's typology, i.e., public's objectives, decision makers' objectives, and technical experts' objectives (Fig. 6.8). In the light of the dynamic nature of human societies, a three dimensional typology may be viewed as too simplistic. Nevertheless, it emphasizes useful notions: people conceive and determine their objectives, experts articulate and assess these raw objectives, and finally, decision makers act to achieve the processed lists of objectives. By having different groups contributing to the process of setting objectives, one naturally expects that the three parties may very well differ in the priorities assigned to objectives. Such a decision is not always rationally justified. There are, for example, objectives which are pursued for individual or temporary satisfaction and others that are pursued for the well being of the whole community. Another disparity is expected between landscape planners and political leaders/public managers. While planners normally act as technical advisors to government officials and leaders, they seem to differ intellectually from them. The difference is not so much in what they

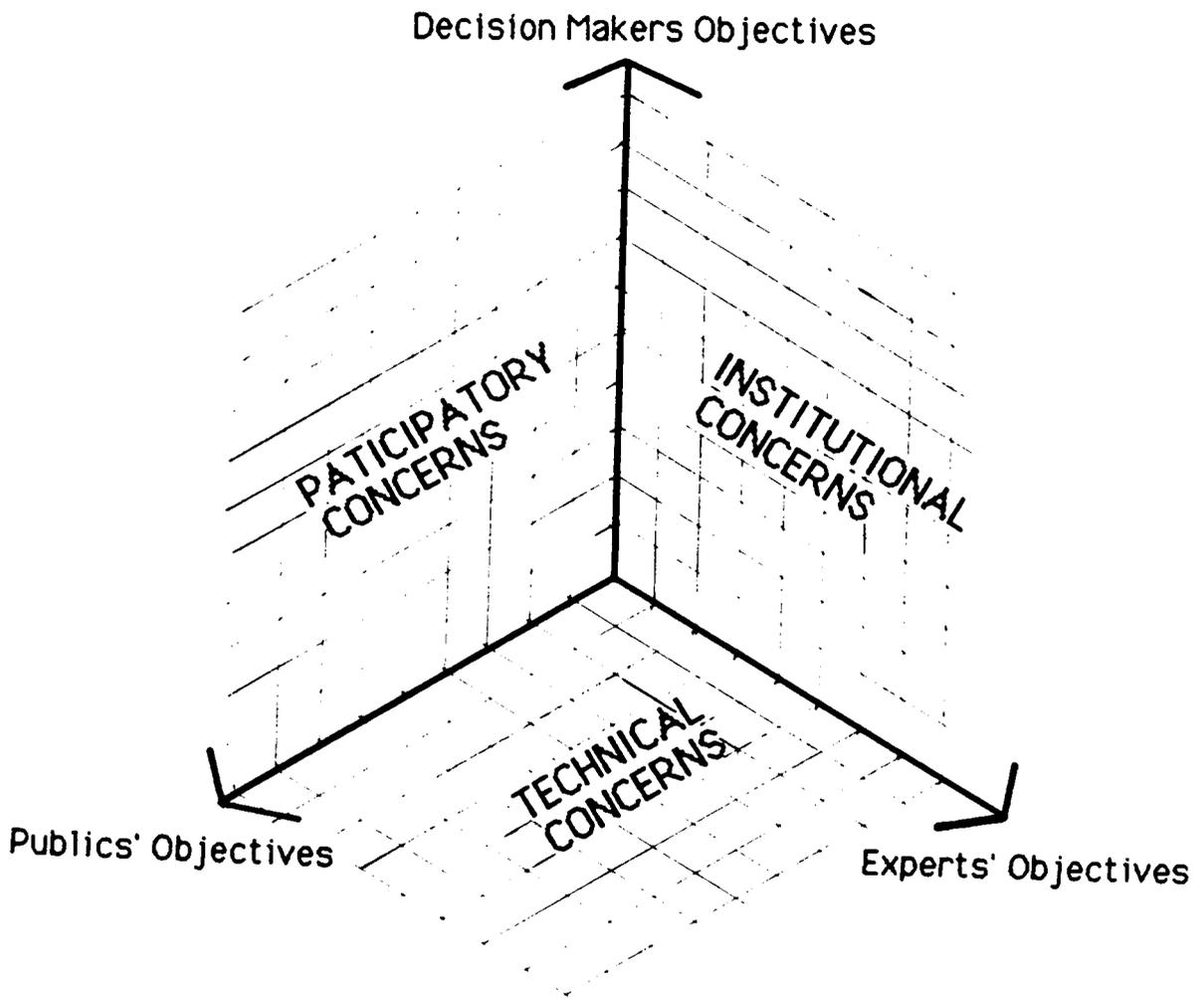


Figure 6.8 Multi realm-based typology

The type of objectives that a country adopts as a priority may vary from one society to the other according to level of development, extent of democracy and involvement of citizens.

perform (which is limited in this case to developing objectives), but rather in their manner of thinking. A typical decision-makers' approach is sequential, i.e., doing one thing at a time. They use labels or names to keep track of things. Their way of knowing is through analytical, logical, and methodical processes. On the other hand, typical designers (among which landscape planners are but one group) tend to employ a wholistic approach and perform parallel methods of processing information. They are interested in creative synthesis, metaphoric relationships, and leaps of insight. Their perception is intuitive, spatial, and multi-dimensional. Their knowledge is of the Gestalt (29).

Central to LAPOS, in general, and the multi realm-based typology of organizing objectives, in particular, is the public. People are the measuring instruments for judging the objectives in the four different phases. Their past experience, perceptions, and expectations for the future all enter into the process (30).

All parties who are concerned about objectives may also be grouped into three basic dimensions: institutional, technical, and participatory. This framework may be useful for managing of the proposed list of public objectives. The institutional dimension considers why, how, and for whom the sets of objectives are being done. The technical dimension includes boundary definition, physical attributes, standards and criteria, and the measurement system. These are all recommended by scientists, artists, and technology experts. The participatory dimension encompasses identifying the characteristics of those who contribute to and/or use the system. These controlling measures are taken to safeguard against duplicated or incomplete inputs. The diversity of participants may be in terms of such attributes as occupation, education, sex, income, age, marital status, family size, ethnic group, and limitations on access to certain information.

Multi realm-based typologies are not entirely alien to the field of landscape architecture. Several Post Occupancy Evaluation studies were based on a similar three-author system, i.e., users, experts, and managers of public projects. These systems help in organizing the community development efforts. Their usefulness, however, is subject to a) the leadership's commitment to a democratic

process of planning, and b) the technical and scientific experts' ability and willingness to voice their views. These two conditions may be rare in most countries of the arid Middle East and, perhaps, in most Third World countries as well.

6.6.7 Sector-based methods

The relevant literature contained several ways to disaggregating public objectives based on sectorial divisions or subject areas; i.e., ecological, economic, cultural, social objectives, etc. In his book, Landscape Planning, Hackett outlines a general list of ecological objectives to be used in landscape planning projects and then he separates them as landscape stability, renewal, diversity, succession, and conservation (31). Wells identifies a major goal for each of the four following principal sectors: population, economy, pollution, and natural resources. In addressing the natural resources' sector, for example, his ultimate goal is to minimize natural resource depletion. In translating this goal into specifics, Wells suggests the following objectives:

- To emphasize the use of renewable resources
- To use multi-purpose schemes
- To concentrate on technology which is able to add to resources reserves (32).

Among all literature reviewed, the most elaborate sectoral typology was used by Giles in planning the Penn Virginia Resources Corporation lands in Wise County, Virginia (33). It contains more than 300 objectives classified under 38 sectors including: health, education, industry, recreation, religion, energy, communications, transportation, social service, civil defense, waste, etc. (Appendix A). For the purpose of LAPOS, a simpler typology is suggested. It builds upon the very definition of what landscape is (Chapter 1.6). The included sectors are: natural resource management, cultural resource management, landscape productivity, landscape beauty, landscape diversity, and land management allocation objectives (Fig. 6.9).

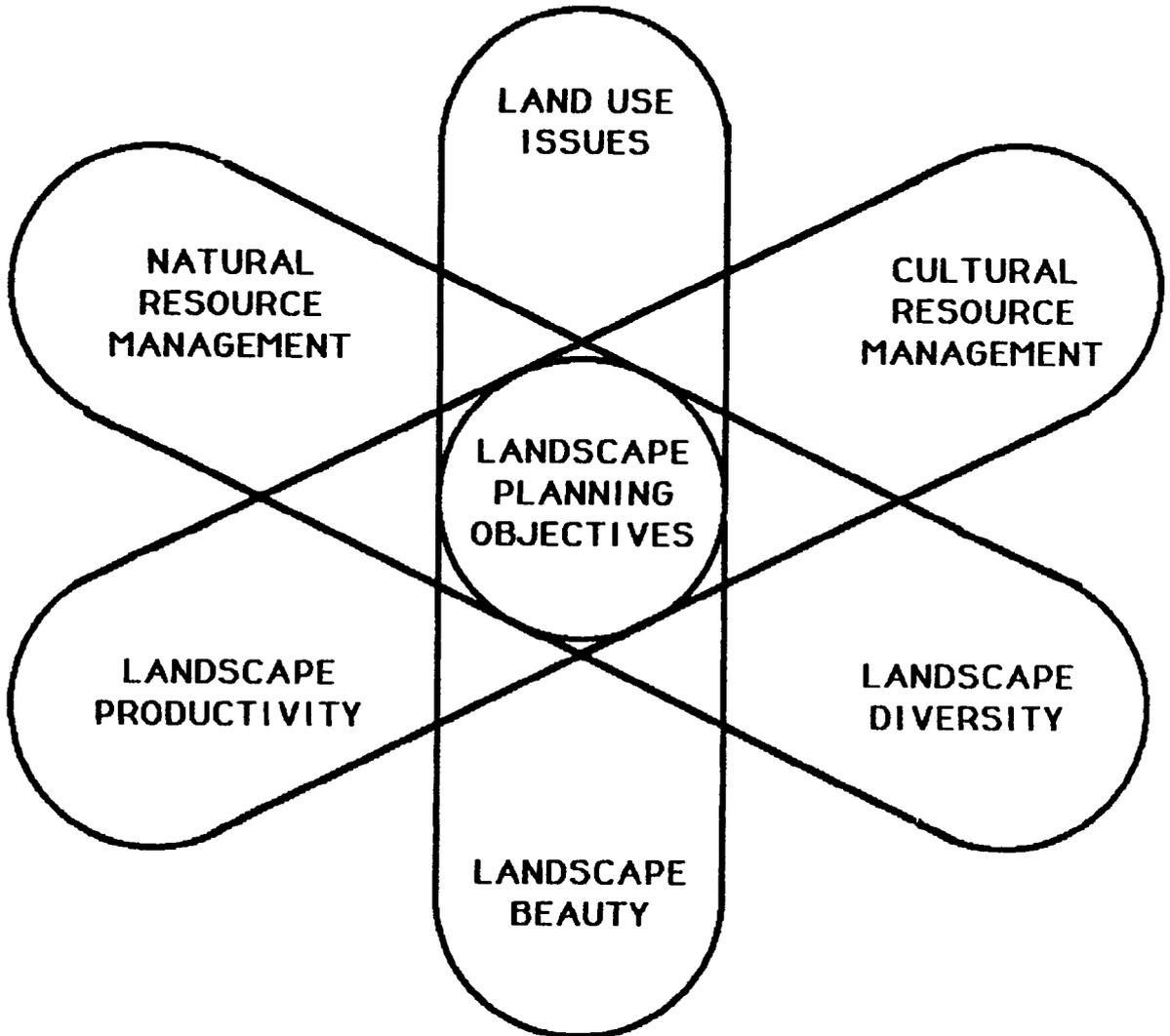


Figure 6.9. Sector-based typology

The six concerns of landscape planning are used in LAPOS as a way of classifying objectives. This scheme is not a taxonomy for administrative and budgetary use, rather it is for academic and educational planning purposes.

Listing objectives according to their sector has often been suggested for its practical advantages. On the whole, it seems to be an attractive system considering the efficiency associated with the division of labor and because, in most cases, it coincides closely with the way bureaucracies are set. Furthermore, the massive size of landscape objectives may call for such a practical division of labor. Some may argue, however, that the wholistic concept of landscape quality is contradicted by any grouping of objectives (34).

6.6.8 *Synthesis*

The previous survey suggests that there is no shortage of methods to classify landscape objectives. Other typologies could be developed in the future. Each method, when carefully analyzed, seems to have some merits. This conclusion does, ultimately, leave an important question unanswered; namely, which typology among the ones reviewed is to be the most useful in setting landscape planning objectives? It would be presumptuous to believe that any one of the above mentioned methods of classification can stand on its own as an organizing system for a long list of public objectives. Rather it may be a general enriching tactic to the process of generating and assessing objectives. It is proposed, therefore, that the proposed Central Office of Public Objectives be charged with the task of organizing public objectives. It is further suggested that the initial input of determined objectives, i.e., the products of the five tasks involved in the first phase of LAPOS, be classified according to the sector-based method that builds upon the definition of what landscape planning is (See Chapter One). Storing and retrieving objectives, however, may be carried out through any other method of organization, i.e., significance-based, temporal-based, spatial-based, etc. Applying various techniques to different phases of the system is not a compromise among diversified methods of classification. Instead, it is an admission that the methods of organizing objectives represent alternative ways of examining and studying objectives. Whether suitable or not, efficient or not, is governed by the context of application.

6.7 Assessing Landscape Planning Objectives

Objectives are of little value unless they can lead to opportunities for making sound decisions. This is the fundamental criterion for assessing a set of objectives. Unfortunately, in landscape planning, the aggregation of discrete measures of objectives into a useful decision-facilitating tool has been a weak link in the planning process. Increasing knowledge about present conditions of the landscape and available means to improve them is making it possible to plan to horizons unthinkable by any previous generation. What is still lacking, however, are landscape objectives that are articulated in measurable terms; that have undergone public scrutiny; that have been adopted by public managers and political leaders; and that have been incorporated into dynamic systems. While methods for assessing environmental impacts have grown steadily in sophistication and accuracy, landscape planners have not yet succeeded in achieving a similar status in assessing landscape objectives. Stuart, for one, points to this deficiency. He believes that:

The kinds of general goals and objectives that cities and regions often set for themselves still suffer from a certain ambiguity as to how they might be measured (35).

The task of assessing objectives is believed to be useful on several accounts. It often provides social satisfaction and thus becomes an advantageous political effort. Of course, by only being aware of the set of public objectives and where the society stands in relation to them is no guarantee that people will be more satisfied than when not having them or will experience a greater sense of fulfillment in their lives. However, one of the main prerequisites for feeling a great sense of fulfillment and for experiencing a pleasant sense of accomplishment in life is recognizing where a person is relative to a standard or goal. Perhaps it is not the objective that people choose or why they have chosen it that matters, but the awareness of where people are in relation to their determined objectives. It is this awareness which may significantly help in giving a society a sense of achievement and hence, meaning in life.

The task of assessing objectives may also be useful in another way. It helps in minimizing the problem of objective blindness. This term refers to the difficulty of seeing objectives because of

their encompassing size and/or distance. People may occasionally be so close to a situation, physically or emotionally, that the proper proportion of the objective can hardly be identified. Objective blindness is, simply, not being able to see the forest for the trees. The story of building the High Dam in Egypt is an illustrative example of objective blindness (See Chapter 5.3).

The term "assessment" is defined as the act of assigning values. Values, however, cannot be directly observed. They may be inferred by watching human behavior and observing people for expressions of them. Approximations of values are believed to be expressible by thoughtful individuals. Much of the remainder of this dissertation is based on this assumption.

The literature review has suggested four major premises in assessing landscape planning objectives: a) there is an increasing need for improving methods of assessing objectives; b) identifying the factors involved in landscape planning objective is an essential prerequisite to its assessment; c) a good knowledge of these factors influences the use of objectives throughout the entire planning and development process; and d) explicit value systems should be stated early in the planning process.

Chapter Five suggests that most of the problems encountered by the people in the arid Middle East could have been avoided, or at least reduced, had they used objectives more efficiently during the development process. Landscape planners of the arid Middle East and elsewhere can better use the objectives identified for their respective regions if they recognize that objectives have dimensions.

Nowhere in the literature are dimensions of objectives emphasized, only multiple objectives. A limited set of the most fundamental dimensions is needed.

Throughout the planning circles, terms such as: a region, a place, a land use, and other geographic-related concepts are implicitly used thus establishing the spatial dimension of objectives. At least one dimension is space.

Time is emphasized throughout the planning literature in terms of: short, intermediate; or long-range planning (Chapter 6.6.3), thus the temporal dimension exists.

The social dimension of an objective, i.e., the people or publics involved, is one of the most fundamental. Based on earlier discussion (Chapter 2.2), an objective may affect a particular region, during a specific period of time, and may be adopted by various groups of the population.

Objectives may be described further along other dimensions. Giles and Sirgy, for example, list 9 dimensions (26). In addition to space, time and population, they suggest demand, marginality, failure index, value, diversity, and substitutability.

For the purpose of the proposed LAPOS the first six dimensions only are used, and their operational relations are estimated. Other dimensions probably exist but they are perceived to have no likely consequence in the way objectives are analyzed or used within LAPOS. Value, diversity, and substitutability, for example, are useful when synergy between objectives is estimated (i.e., an issue with which this proposed system does not deal).

6.7.1 Analyzing the dimensions of objectives

Analyzing the dimensions of individual objectives is a useful activity. It adds to understanding and to appreciating the complexity of objectives. Analyses may also provide explanations of past failures. Analyses are not enough; something operational is needed. What does LAPOS do with the knowledge gained from analyses? The aim is to help make easier the hard choices of the landscape planner. A procedure, once created, can insure that these choices are in harmony with the society's value system. A procedure of analysis is developed to assure that the best possible project (or program or policy) is selected from among feasible ones that achieve a society's objectives.

Objectives are a positive means for directing action within the landscape. Impact analyses, in essence, the extent of failure to achieve objectives, are not presented here. They are discussed abundantly elsewhere (37). They differ from LAPOS by being project or site specific, do not evaluate many alternatives, have very different purposes in society and, at least in the U.S.A., are

only of advisory nature, i.e., a project may still be approved even if it has shown that there are great impacts. Few people realize that every action on the land causes impacts. There is no “best place” only the “least bad”; there is no totally beneficial project, only projects that are more beneficial to some parties, less to others. Analyzing objectives, particularly since they can be stated as “to maximize, to minimize..., to increase, to decrease, to stabilize, to improve, and to innovate” allows happenings like erosion, desertification, salination, depletion, deterioration, overgrazing, and similar topics to be addressed as objectives rather than impacts.

Within LAPOS, the procedure for creating a ranked list of objectives is:

- a) Landscape planning objectives are assessed along their six dimensions,
- b) The weighted importance of each dimension is assigned,
- c) A grand index is calculated for each objective, and
- d) A ranked list is then prepared.

The dimensions of landscape objectives are six. They include: space, time, population, demand, marginality, and failure index. How are the magnitudes of the named dimensions to be estimated, i.e., on what scale and with which measuring units?

Within LAPOS, measuring each dimension for every objective is a means to calculate a score for how important a proposed objective is to the people of a region on a ratio scale (i.e., objective X may affect 10% of the area of the region; 100% of the time, 90% of the population, and so on) (Fig. 6.10). The following section addresses each of these six dimensions.

- Space

Every landscape objective affects a specific region or place. Since more than one population or public may use the same space at the same time, being specific about the region should aid the planner and the decision maker in setting priorities and carrying out objectives. Naming space or the region identifies the relevant subsystem. It names part of the boundary of the total context.

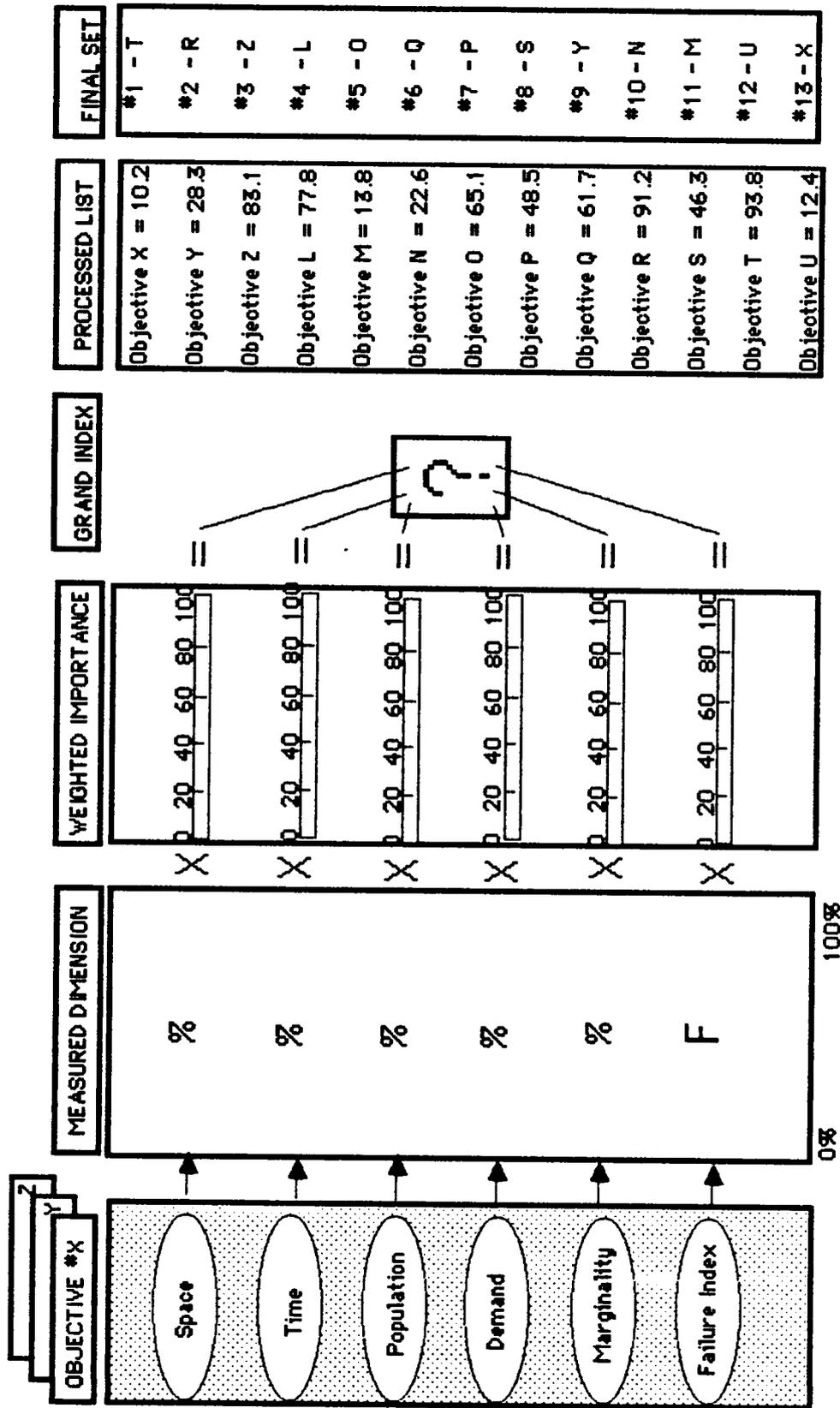


Figure 6.10 General procedure for computing the grand index used in ranking objectives within LAPOS

A logical question may immediately arise: What are the boundaries of a region? i.e., what is the area of influence of a specific objective? Simple as it may seem, this is a non-ending question and it is not a researchable question. The answers are a-biological, a-geographical, etc. The boundary of a region is not the end of a desert, the edge of a mountain, the border of a forest, or the coast of a river. It may be a combination of these and others or none of these and others. Nevertheless, the concept of outlining various landscape regions is a useful one. Determining the boundaries of these regions, however, is not an easy task since it involves a mixture of subjective decisions and rational examinations. Such a decision may change from time to time because a large element of human judgements is always present.

Typically, landscape planners are concerned with the environmental impacts of their proposed projects, programs, and policies. Whether the assessment is carried out by applying Cost-Benefit Analysis, Planning Balance Sheet, Goals-Achievement Matrix, Energy Analysis, Land-Suitability Analysis, or any other evaluation technique, the question of what is the extent of the impacted zone will, sooner or later, be raised. A single proposed action may influence region (x) in terms of surface drainage factors, region (y) in terms of wildlife factors, and region (z) in terms of scenic quality factors, etc. Similar complexities may occur when pursuing landscape planning objectives. For example, assume that a certain community in one of the arid regions of the Middle East has adopted the following landscape objective: "to protect areas which have significant natural resource potentials against urban encroachment." The area within which that objective may optimally be achieved may be studied by various experts, e.g., a geologist, a hydrologist, a wildlifer, a landscape architect, a forester, etc. Their separate recommendations are unlikely to be the same (Fig. 6.11). This multiplicity of boundaries may include a watershed, a visual corridor, or a particular plant community zone among many other zones that are all relevant to the same objective. Furthermore, the interaction of the different ecosystems within any geographic region produces a unique landscape. Geographers and regional planners, among many others, have long addressed this notion of ecological interaction. Ecologists, for example, have produced several methods of ecological classification that expressed the interactive nature of various components within a region.

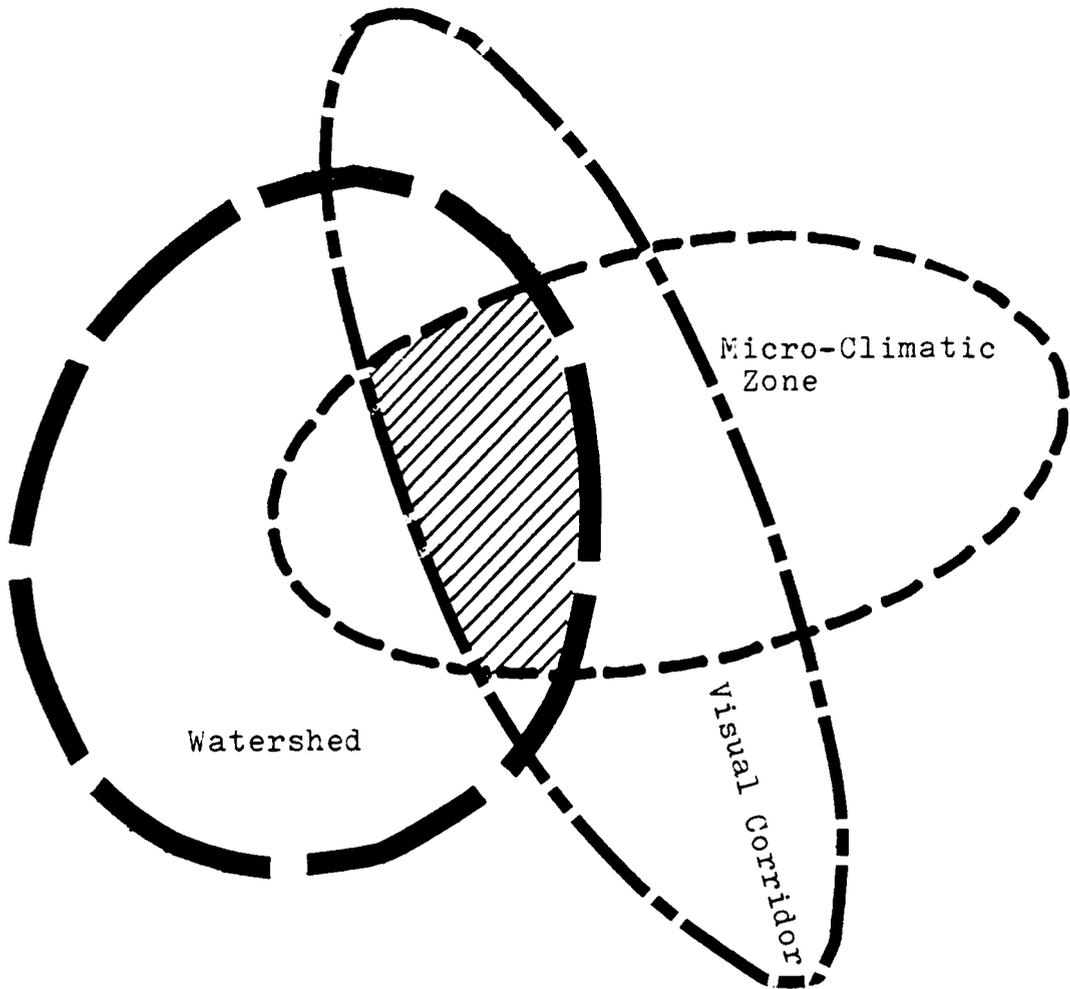


Figure 6.11 Defining the space dimension of an objective. Determining the boundaries of a region within LAPOS involves a mixture of subjective decisions and rational investigations.

Graf and Giles conclude that regions should be computer analyzed for resource homogeneity (38). They, among others, describe concepts of a dynamic computerized system of representing regions which may facilitate the task of recognizing the appropriate region for each identified landscape objective.

- Time

Time is irreversible. It cannot be slowed down or accelerated. In nature, the time required for events to occur or tendencies to develop independently without deliberate human intervention varies widely. Sequence, duration, regularity, intervals, and probability all may be aspects of the time dimension of an objective. Accordingly, the time necessary to realize a landscape planning objective differs significantly among cases. One of the biggest mistakes into which many societies fall when planning their regions is not being aware of all the demands that a particular objective and its associated tasks call at a particular time. An objective that is decided upon today by the present generation will likely affect the lives of several future generations. Such affects are too important either to be treated lightly or to be hidden behind vague statements. Planning scholars have always tried to determine the influence of time upon planning decisions. Although there is no universally accepted formula useful for considering the time dimension in the planning process, planners have mostly used a three-fold system. They are simply long-range, intermediate-range, and short-range planning. No universally accepted time spans are associated with these terms. However, the following ranges are typical:

- a) Long-range planning: 10 or more years from present
- b) Intermediate-range planning: 1-10 years
- c) Short-range planning: one year or less (39).

Long-range objectives tend to be unspecific while short-range objectives are usually steps contributing to accomplishing intermediate and long-range objectives.

The above temporal system may be criticized as too simplistic, static and/or incomplete. Future changes evolve from some aspects of the past and present and, thus, the ties among all three time

zones are essential ingredients for assessing the validity of an objective. Nadler, for example, has identified three essential axioms associated with the time dimension. He suggests three notions:

1) A continuous (rather than discrete) timeline is the fundamental basis for understanding the past, present, or future of any phenomenon. 2) The timeline version of human objectives is often portrayed in a life-cycle perspective attributed to almost all products, solutions, and systems: creation, development, growth, decay, and death. The last part, death, can also reflect modifications of or additions to what previously was considered a good solution or set of human objectives, and 3) What may initiate the perception of a problem and the establishment of an objective may be changed by age, human nature, normal changes, external disturbances, and internal power and organizational shifts (40).

In conclusion, he emphasizes the wide gap between "the real-world people" and the planners to whom he referred as the "purposeful activity people" and suggests how such a gap can be bridged.

The purposeful activity people must be continually interrelating with the real world, day by day, week by week, and so on. This allows the perceptions and behavior of those in each world to be modified and adjusted to accommodate the realities and knowledge of the other (41).

The problem of reconciling short term decisions with long-term objectives is far from trivial, and the record of human history shows that such a reconciliation may not provide an altogether reliable mechanism for daily decisions, either on a personal or national level. Modern economists have addressed the issue of time and concluded a distinct procedure for its treatment. They observed that people are not willing to pay as much for something they are to receive at some future date as for something they could have immediately. Another way of describing such time preferences is that people may be willing to give up future benefits in return for receiving more in the present. Based on this economic theory, there is a quantitative ratio between future and present gains to which any person may be indifferent. Various points of indifference can be expressed by the compound interest equation (42).

The dimension of time in a landscape planning may be considered as analogous of the monetary discounting period or years of an objective. For example, desert lands reclaimed for agricultural or pastoral use normally need ten years. Investments may be best conceived in the longest possible term because the greatest benefits for desert reclamation, and other arid-lands-related projects come years after the investment and because their results fluctuate considerably through the first 10 years of operation.

- Population

Each society seems to be unique. There are various "publics" (43). To try to meet the basic biological needs (i.e., air, water, food, and shelter) of each person may be an attainable task. But to attempt to satisfy the human wants and aspirations of the average person may lead to an enormous waste of resources and significant failure. In brief, an average person does not exist. Lynch, for one, suggests that there are at least 32 types of users present in a single planning project (44) (See Chapter 2.4.4).

Balling and Falk conclude that people's preferences for different landscapes may be related to development in social groups throughout their life spans (45). In one study, Zube, Pitt, and Evans also suggest that perceptions of scenic landscape values vary over lifespan, particularly among young children, middle age adults, and the elderly (46).

In another study, Lennhouts demonstrates that the attitudes and values of the deer hunter public in Michigan changed with their average age. Levels of satisfaction among deer hunters significantly changed as the age distribution within the hunter population changed (47).

These studies and others suggest that differences in culture, education, prior experience, age and many other factors cause "publics" or distinct groups to exist. Also, it seems that each public may have a unique list of objectives. Even if identical lists exist for different groups, the values and other dimensions differ (48). Thus, it is evident that it is not only the number of people to which an objective applies that is important, but the extent to which it applies since people are different.

- Demand

Every objective requires recognizable units of demand. Acres of reclaimed land, tons of eroded soils, gallons of fresh water, and linear or square miles of sandy beaches are all examples. The

reason is that, eventually, units must be compared and conflicting use of the same resource must be reconciled.

One of the peculiarities of land, is that, unlike most things, its total supply is relatively fixed by nature (49). This characteristic feature of land underlines the challenge of reconciling competing objectives that demand a portion of its use. Demand is the expression of desired amounts or sufficient units of resource associated with each landscape objective. The quantities needed by people or the condition of sufficiency of an objective should be articulated. An objective may be very significant to a society, but people may not need very much of it (e.g., preserving threatened species of wild fauna and flora or examples of historic sites).

Benefits are not directly correlated with the abundance of landscape elements (as defined in Chapter 1.6). "More" is not always "better" and is not a suitable expression of demand, i.e., the dimension under examination. This notion is illustrated in Figure 6.12. At A, the resource (a beach, a wildlife habitat, an archeologic site, etc.) is unknown, rare, threatened, or undeveloped. However, it is highly prized. People will travel great distances to visit and they will contribute large amounts to preserve it. It will take a substantial effort from a few interested people to use and/or enjoy. At B, the resource is no longer unknown; it is accessible but too costly to use and/or enjoy. During C, the population builds and more people/users typically want more. The demand climaxes at D, probably at high cost and beyond a reasonable margin of return. At E, the benefit to population is the same as D, i.e., the more resources being available does not mean they will result into more benefits to population. The landscape planner's role is to discover the very best zone of this curve, perhaps between C and D and to mobilize efforts to reaching that zone and not to exceed it. This will be discussed under marginality.

The dimension of demand in LAPOS is measured, like all other dimensions, on a ratio scale. There is likely to be a need for new and unfamiliar measurable units for certain cases such as in cultural resources objectives and landscape beauty objectives. It is assumed that these will be established, (at least researched and recommended), by the team of experts of the Central Office of Public Ob-

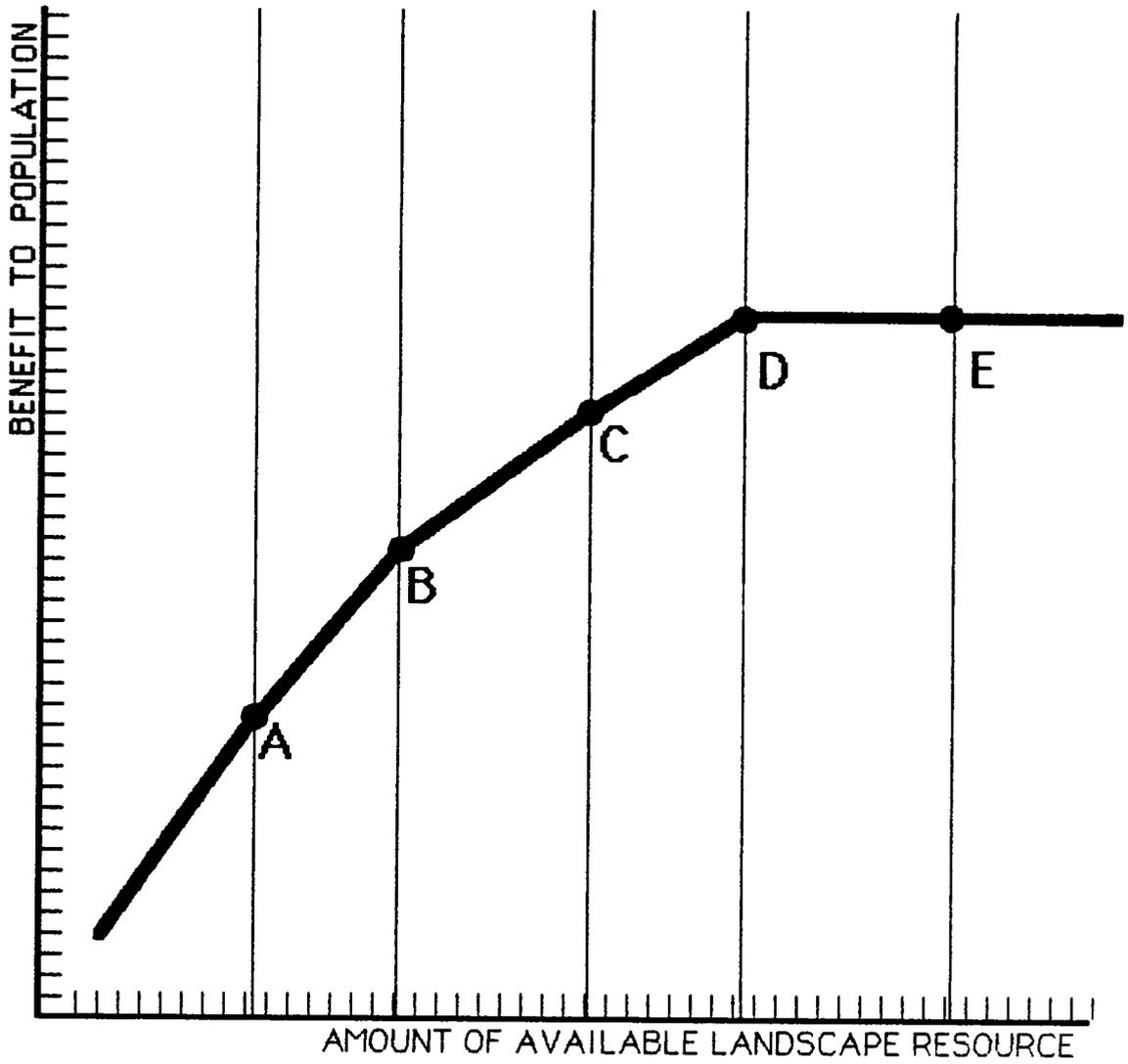


Figure 6.12. The dimension of demand within LAPOS
Benefits are not directly correlated with the abundance of landscape resources available to the users.

jectives. It is beyond the realm of this dissertation to suggest units of demand for each objective. However, it is believed that people express demand as: a) minimum numbers of units perceived to be needed, b) number desired or wanted but not on some excessive scale, and c) number where benefits are likely to remain constant, where "too much" would be evident. These three zones or ranges with some adjustments (plus or minus a few percent), could form the basis of a conceptual framework for establishing more reliable technique of measuring this dimension.

- Marginality

The concept of marginality is well known to students of economics. Marginal cost is the additional cost of producing one extra unit (or achieving one extra objective). Because marginal cost has this property of optimality, it can, with some care, be used as a yardstick to detect inefficiency in any set-up (50). Increasing costs usually occur as more and more units of a thing are acquired or produced. There will come a point at which the cost per unit of gaining additional units will rise; this phenomenon is based on the law of diminishing utility.

In the process of assessing objectives, the principle of marginality is always associated with the principle of marginality, also urges the planner to apply precision while assessing objectives (51).

- Failure index

Landscape planning is concerned with the future, occasionally the distant future. Landscape planners operate in an environment of uncertainty. The impacts of accomplishing a landscape objective can rarely be stated with certainty because they hinge on: a) the occurrence of events that cannot be accurately foreseen, b) the availability of information that cannot be gathered, and c) variations in natural and social systems. Uncertainty has been defined as doubt resulting from lack of information or knowledge. Determining landscape objectives, among other planning activities, is used to increase the amount of information needed by a decision-maker, thus uncertainty is involved in almost every approach of setting objectives.

The terms uncertainty and risk often are mistakenly used interchangeably. It is important for landscape planners to differentiate between them. Branch defines risk as “the relationship of uncertainty to hazards and other conditions significantly affecting the functioning of animate organisms” (52). McAllister suggests that when threats (the probability of dire events occurring) can be estimated, it is called a risk situation; when the probability of such events cannot be estimated, it is called an uncertain situation (53). Landscape planning decisions must involve an assessment of both risk and uncertainty based on the weighing of existing information and a systematic judgement of costs or benefits of unknown factors.

In brief, and for the purpose of this dissertation the following definitions are adopted:

- a. Certainty is a state of knowledge in which the specific and invariable outcomes of pursuing each alternative objective is known in advance. Certainty involves the presence of only one end state. This situation allows the landscape planner to predict the outcome of each objective in the list with 1.0 probability. This condition is not known to exist, but provides a conceptual standard.
- b. Risk is the expression of a state of knowledge about which one of a set of specific end-states will occur after a decision is implemented. It is an estimated probability. Branch identifies two kinds of risks that are associated with planning (54). The first is the risk of natural forces and events. It relates to changes continuously occurring in the natural environment over which humans have little or no influence. However, a probability estimate is possible. These include global weather, earthquakes, tidal waves, and other similar environmental forces. This can be addressed, at least partially, by conducting more and better research. Branch states:

When enough comparable experience or specific observation has accumulated to link cause and effect, event and results, situation and consequences, judgement probabilities can be formulated and exercised. They may represent personal intuition or logical deduction. Groups can also be scientifically structured to produce collective expert opinion (55).

The second kind of risk is that of human actions (or intended actions). This is related to forces and events that humankind can influence in a significant and observable way. These include modifying waterways by dams, changing topographic features by massive earth movement, and directing de-

velopment through policy making and law enforcement. These too have probability assignments and may be expressed over a range.

Within LAPOS a Failure Index (F) is an expression of the probability of an adverse or undesired end-state to a decision-maker from failing to achieve an objective. The index involves risk and severity. It may be expressed as:

$$\text{Failure Index (F)} = \text{Probability of failure} \times \text{Severity Index}$$

The smaller the value of F, the more one would expect success. The greater F is for an objective, the more resources need to be allocated to achieve that objective.

The following are premises for including the failure dimension for assessing landscape objectives:

- An objective has a risk dimension that is associated with how dangerous or harmful it is if not achieved (i.e., if zero or insufficient amounts of demand are achieved).
- A Failure Index has two aspects, risk and severity (56).
- Formal, objective methods exist for treating risk (57).
- Risk assessment can be scientific, objective, and almost value-free.
- Subjective, judgmental data can be incorporated into the planning process with a Failure Index to complement more readily available objective information.
- Ideally, the Failure Index analysis and dissemination of such information should be performed systematically on a continual basis.
- Over time, estimates of risk can be improved with directed research.

Within LAPOS, it is proposed to use a ratio scale for all dimensions. For the six named dimensions, individual objectives are rated. In estimating the space dimension, for example, an objective that would enhance all the ecosystems of a region is assigned 100 while an objective that would affect no ecosystem is assigned 0. Similar treatment is applied to time, population, demand, marginality, and the Failure Index dimensions.

6.7.2 Weighted importance of dimensions

A systematic method of analyzing the dimensions of landscape objectives may make the hard choices of a decision-maker a little easier. Ultimately, however, the primary role of that method is to insure that choices are not made in ignorance of society's value systems or without considering the various beneficial and adverse impacts of each choice on the complex landscape of a region. The other role is to gain in cost effectiveness of government. When each proposed objective is described in terms of the dimensions listed above, decision-makers can comprehend them better. On the other hand, this morphological analysis poses what economists refer to as "the evaluation dilemma." McAllister, for one, writes:

To understand the implications of a proposed action, it is very useful to divide the impacts into many component parts, but to arrive at a judgement about its desirability it is necessary in some way to reassemble or synthesize the parts into an understandable whole. To eliminate the analytical step of detailing the impacts is obviously unacceptable (58).

Accordingly, any further development of the lists of objectives will depend on how the following two questions are answered:

- a. How are the weights, which indicate the relative importance of each dimension, to be measured or assigned? (i.e., based on expert judgement, market price, public polls, or others).
- b. How are these measured dimensions to be used together to reach a decision about an action? In other words, how can a landscape planner acquire a wholistic view from the many component pieces? and how does he perform a trade-off analysis for the above-mentioned six dimensions?

Answers for the above questions can be found in the systems engineering literature, particularly the ones dealing with the experts' judgement (59). Analytical Hierarchy Process (AHP), for example, was designed to be applicable to such situations. It later was developed in the early 1970's by Thomas Saaty. His ideas were later applied to a variety of topics including energy allocation, technology investment, and many others. The AHP technique operates by using pairwise com-

parison judgements to consider factors (or dimensions) which are not effectively quantified. Factors subject to uncertainty, ill-defined parameters, and inexactness in measurement may be considered with this judgemental process.

For each determined objective in a list, the interdisciplinary team of experts administering LAPOS prepares the list of weighted importance for each case based on careful research of society's preferences. The emphasis must be clear: LAPOS staff collect and handle the landscape objectives; the weights are assigned by the people. A staff member may express his or her preferences but only as a single citizen in the procedure. As an example of preference, an objective that involves landscape productivity that affects basic needs (i.e., air, food, water) would most likely be assigned 100 in terms of weighted importance for the Failure Index dimension, whereas another objective that deals with, for example, quality of life issues, or landscape beauty would be assigned 50 or less along the same scale.

6.7.3 The grand index

The common way most people address the "evaluation dilemma" is by devoting whatever time is necessary to study the parts and relying on the human brain to form an understandable whole. But as the number and complexity of issues, objectives, dimensions, and priorities have increased, the time allotted to each has greatly diminished, and the urgency for gaining time-saving, synthetic methods has grown.

Some people believe that a way to combine the many component pieces is by devising an equation summarizing all the identified dimensions in a single score or grand index to which a simple criterion can be applied for weighting objectives, i.e., the higher the score the higher the importance of this objective in the list. Some problems were experienced association with such a technique but they can be overcome by keeping the list of objectives large, flexible, up-to-date, and dynamic. In LAPOS, one may arrive at a grand score of an objective by first multiplying the weighted impor-

tance of the space dimension by the measured quantity for that objective. Second, the results of similar operations for the other five dimensions (of the same objective) are added together to derive a grand score for each objective being assessed. The resultant grand index does not represent "truth." It is simply an integration (or an indicator) using the best currently available information on each objective as to how well it will affect the total landscape and the people of a region. It does not provide a means of selecting objectives, but it can allow those already selected to be ranked. Decision-makers may use these grand scores to pick the highest and pursue it in further detail (i.e., through relevant projects, programs, and policies), or even use low scores to simplify a list for further work.

One way such a grand index may be computed, and is recommended here for LAPOS is in the form of a linear combination as follows:

$$I_x = s(x_1) + t(x_2) + p(x_3) + d(x_4) + m(x_5) + F(x_6)$$

Where, I = Grand Index of objective x

s, t, p, d, m, F = measured dimensions of objective x

s = % of space

t = % of time

p = % of population

d = % of demand

m = % of marginality

F = Failure Index

x_1, \dots, x_n = weighted importance of each dimension

This general equation has been used in many fields and often applied in some landscape planning circles. There are several important differences in the specific equation proposed for LAPOS to that used by Giles (60), and Giles and Sirgy (61).

Here (as in Giles and Sirgy) a ratio scale is implemented by assigning one of the 6 dimensions a weight (x) of 100, this signifying the dimension of the greatest importance within the context. All

other weights are assigned relative to this. Equal weights can be assigned. These are not ranks or sequence numbers. Rather, it is an effort to express the perceived importance of each dimension relative to others within a specific objective. This operation is carried out for each objective in the list.

In LAPOS, the space(s), (the area, the region, the site) for which the landscape planner is responsible, is considered separately. The percent of the space likely to be affected by an objective is made explicit in (S) and then assigned a level of importance, (x_1). One can imagine a small area of effect but one of great importance (e.g., the lands irrigated by the Aswan High Dam is only 4% of the total area of Egypt but represent the primary source of food for the 50 million inhabitants). The user of LAPOS will likely assign the highest level of weighted importance (i.e., 100).

Time (t) within the equation is considered as the period for which the objective is desired to be in effect. For some objectives, e.g., ample drinking water, the period is very long. Based on the previous discussion of time (Section 4. 7.1), functional planning computations assume 10 years or above to be long-range and one year or less to be short-range. Accordingly, a long range is assigned 100 and the rest may be prorated.

The population (p) in the equation, is the percentage of the total people in the region for which an objective is likely to be relevant. Later, sub-groups (publics) may be analyzed. When there are 1 million people and the objective is likely to be held by half of them, the weighted importance is 50. The above three dimensions can be used alone in a simplistic weighting of objectives to compute a total score. For a large number of objectives, it is likely that many will have the same index making the task of discriminating among them impossible. For this reason, other dimensions may be included that distinguish each objective as it relates specifically to people.

Demand is the number of units perceived and expressed as needed (e.g., 1 million gallons of water, 2 million tons of wheat, and so on). The assumption is that expressed needs closely approximate actual needs, although these are known to differ. The amount needed is stated. Demand will al-

ways be measured as 100% (plus or minus a few percentage points for variability) of the stated units. Demand per se does not provide any discriminating power in ranking objectives, but does when it is weighted.

Within the LAPOS equation, marginality (m) is calculated based on the demand and the lowest estimated cost of achieving that demand based on the assumption that current feasible technology will be used. This value m is assumed to be the best investment and thus, (as for demand) it will always be assigned the value of 100. How well a proposed project meets this dimension of objective can be compared later as a percentage of (m). It may be rejected because it exceeds this ultimate value. It is weighted in importance by x_3 . The emphasis in the marginality dimension is on cost effectiveness. Other expressions of marginality may be used because some objectives are declared to be needed "at any cost," others seek maximum benefits, or others are strongly budget-constrained. Herein, only one way has been presented to demonstrate that the dimension can be estimated, that results can be obtained relatively easy, and that the results have several apparent uses.

The Failure Index, as described above, is computed as the product of the estimated risk (r), to the population of failing to achieve the objective, and the severity (v) of the failure. The value of (r) ranges from 0 to 1.0, where 1.0 means absolute certainty of failure. The value of (v) ranges from 0 to 100, where 100 implies wide-spread human death during grave conditions. The higher the Failure Index, the higher will be the objective in the ranked list. The Index is computed simply as: $F = r \times v$. For example, when there is a low risk of failure ($r = 0.2$) but the severity if failure does occur, is high ($v = 90$), then

$$\text{Failure Index} = (0.2) (90) = 18$$

The Failure Index is weighted (x_6), the weighting involving subjective value assignments resolving (within the relevant decision-makers) the relative importance of avoiding a "bad failure" compared to achieving an objective for the masses, extended period, or massive area. Table 3 demonstrates the process of computing the Grand Index for two different objectives. They are:

Objective A: To promote tree planting programs as a way to help relieve the critical shortage of firewood among nomadic people.

Objective B: To prepare people to live through the inevitable droughts.

6.7.4 The processed list

At the end of the procedure suggested above, the LAPOS staff will have in hand a ranked list based on a score computed for each objective. The staff carefully edits and organizes the list according to the grand score computed for each objective. This set needs to be fixed to a specific planning horizon so that the subsequent judgement on actions related to each objective is made within a proper time frame.

6.7.5 The evaluators

Who measures the magnitude of each dimension? Who assigns weight or relative importance to each named dimension? Within LAPOS, the former task is considered to be predominantly technical and thus is the responsibility of a team of experts. On the other hand, the latter task is political and reflects the societal value system. It is, therefore, entrusted to the leaders, the people, or a panel of representatives of the people (not the experts, the planners, or the managers). The situation will probably vary from one country to the other. LAPOS does not survive or die based on who decides weighted importance or what they will decide.

A crucial methodological question is how up-to-date the value system is within a region. Attitudes toward objectives vary under changing situational constraints. Not only do circumstances change, but human values and attitudes may also change. Therefore, all six dimensions of each determined objective within LAPOS need to be estimated regularly. Sampling the total population is possible

Table 3. Demonstration of the computation of the grand index for two objectives (A) and (B)

Dimension	Measurement	Weighted Importance	Total
Objective (A):			
s	= 100 (all the region)	x 60	= 6000
t	= 30 (3 out of 10 years)	x 90	= 2700
p	= 60 (60% of population)	x 90	= 5400
d	= 100 (demand is constant at 100%)	x 100	= 10,000
m	= 100 (marginality is constant at 100%)	x 100	= 10,000
F	= (0.3) (73) = 22	x 10	= 220
			= 39,720
		Grand Index =	$\frac{39,720}{600} = 66.2$
Objective (B):			
s	= 60 (60% the region)	x 90	= 5400
t	= 60 (6 out of 10 years)	x 70	= 4200
p	= 90 (90% of population)	x 100	= 9000
d	= 100 (demand is constant at 100%)	x 100	= 10,000
m	= 100 (marginality is constant at 100%)	x 100	= 10,000
F	= (0.9) (90) = 81	x 100	= 8,100
			= 46,700
		Grand Index =	$\frac{46,700}{600} = 77.8$

but it is a costly task. Ideally, therefore, a panel of representatives that reflects the position of the citizens in a specific region need to be consulted. This way, a close and continual interrelationship can be maintained between the LAPOS staff and the society.

An ideal, typical scenario is: the panel of representatives should be asked to assign the levels of weighted importance for each dimension for each objective. Aids for doing so (computer programs, analytical hierarchy process, bidding games, and analogies) might be created by LAPOS staff (Chapter 6.7.2). If infeasible, then the LAPOS team of experts should assign these levels based on rational technical judgement, sensitivity analysis, and socio-economic research. Consequently, the team will conclude which, if any, are significant dimensions and which are not. Gradually, the panel of representatives might be encouraged or adequately trained to assign relative importance of the six dimensions, particularly for sensitive objectives. This interaction between technical experts and representatives of the public is particularly significant. It is essential that some type of citizen input is made in addition to that of the experts, who may also be citizens. When a landscape planner solely suggests the relative importance of each identified dimension for the determined objectives, he or she applies his or her personal perceptions of the society's concept of the desirability or undesirability, the goodness or badness, of an end-state. If these suggestions are valid and happen to coincide with the existing trends and attitudes of society, then no harm is done and the landscape plan will probably be a successful one. This is a remote coincidence. On the other hand, if weights are based on hazy assumptions rooted in hunch, whim, myths, or wishful thoughts, the landscape planner may be setting up intolerable conditions for the people and crises for the region. Resources of a region may be allocated on several bases, of which the abovementioned panel's consensus is only one (62). There are other techniques in decision theory which may be applied to this step in LAPOS among which are the Delphi technique, the analytical hierarchy process (AHP), and the fuzzy set model. In brief, weighted importances are set for each dimension of each objective to reflect their relative importance in terms of the community's values.

6.8 Managing Landscape Planning Objectives

Management is obviously one of the most important components of any planning system. If the machinery for management is inadequate, even a system of the most soundly based planning objectives will be viewed ineffective. Management is the process through which the proposed LAPOS is brought into existence, implemented, controlled, monitored, and continually improved. The responsibilities of carrying out the various management activities within LAPOS are entrusted to a staff which should coordinate the following activities:

- a. Introducing the idea of setting objectives through LAPOS to all concerned parties.
- b. Controlling, storing, manipulating, and using the processed objectives.
- c. Producing the suitable required sets of objectives in the appropriate medium.
- d. Conducting different evaluation tests during the various phases of implementing the objectives.
- e. Modifying the objectives based on the results of these evaluations.

The concept of landscape objectives evaluation implies that both the processes and products of LAPOS must be tested periodically to ask such questions as: What went right? What went wrong? How might the processes of determining, organizing, and assessing landscape objectives be improved?

Churchman suggests that: "The true benefit of an information system must be measured in terms of the meaning of information for the user (63)." A major user of LAPOS is the planner whose main interest is to produce a landscape plan first and to implement it second. Just like art, a "good" plan reflects elegance, logic, wisdom, and imagination; but, unlike art, its value is not judged on aesthetic criteria. Landscape plans must be valued by the extent to which their implementation produces desired results to the society. LAPOS managers should evaluate the system's behavior and characteristics at frequent intervals to check their continuing utility and reliability. Controlling the system is a means to maintain the relevancy of determined objectives to the current activities

on the land (64). Also, carrying out these periodic performance reviews may be helpful in gauging and comparing society's objectives and actions. The reviews remind the community of its objectives and motivate it to continue working toward them.

6.9 Summary

In the past, setting objectives has not been fully developed as a systematic component of the landscape planning process. The primary message of this chapter is that landscape planning objectives have more identifiable characteristics than are commonly believed. By studying these characteristics, comprehensive and useful sets of objectives may be established for landscape planning projects and programs in a way that is more conspicuous than usual.

The significance of setting objectives and the difficulties associated with various existing approaches have been examined and a more advanced approach seems needed. Criteria and steps for this approach have been suggested and applied to guide in developing the proposed LAPOS. It is also suggested that public apathy or even public resistance is likely to develop toward proposed projects in which private citizens are excluded from setting their objectives.

Landscape planners can master the complex task of developing and setting objectives. As analysts, they can assist their society in setting their objectives in their full dimensions.

LAPOS is comprised of six interactive components: context, output, input, process, feedback, and feedforward. There are four main phases: a) determining, b) organizing, c) assessing, and d) managing landscape planning objectives. This system, with a well-developed set of clear societal values, can become a rational basis for regional development activities. Benefits, ranging from reduced frustration, improved communication through sophisticated optimization systems, improved budget allocations, increased profits, and other advantages, are all expected from LAPOS's use. Feedback for improving landscape planning activities is dependent upon having specific, quantified

objectives. When criteria for these objectives are established, checks can be made; the relative status of a project determined; and corrective changes made. One should realize the decision that must be reached by LAPOS users, based on technical or logical grounds, is also a value-laden decision.

As one author writes:

Who we are and who we want to become is a human constructed decision, not to be presented by science. It can be dynamically changing as values change, but it remains a human judgement (63).

Nevertheless, human judgement can be guided by the research findings in areas such as: "Multi-objective Decision Theory," "Multi-attribute Utility Theory," and "Analytical Hierarchy Process."

A carefully processed set of landscape objectives for a whole region or for a whole country may foster a sense of the total community of humans, underline responsibility for the fate of the landscape, and relate self interest to the interests of fellow humans and future generations. Although it is possible to spend much time and money usefully on an assessment, a short and inexpensive assessment may be quite useful if it is carefully thought out and well designed.

On the whole, setting landscape planning objectives consists of a diverse set of studies with a common purpose: clarifying and quantifying objectives for users. The approach suggested here may assist in achieving that purpose.

Users of LAPOS should not be discouraged if they find themselves occasionally disoriented. It seems to this author that it will be better to follow a list of objectives imperfectly than to have none at all. The process does not have to be perfect to be useful. It can be a long-term one -- progressively adapting and gradually growing. Changes in large social systems usually occur on a slow, erratic basis; this may be called incrementalism. Setting objectives may help people achieve a purposive incrementalism. This would be progress. In conclusion, this chapter argues that the proposed LAPOS is not a new or a separate process to be carried out independently by a new type of expert. LAPOS may not change the basic challenges which face decision makers and landscape planners, but it may add new sophistication and an enlarged range of ways in which planners may go about addressing these challenges and answering basic questions of regional development.

Footnotes

1. R. H. Giles, Jr., "CAPS-Watersheds: Citizen Objectives for Watersheds as Human Living-Space, Note 3," 1983.
2. O. Faruque, Graphic Communication As a Design Tool, (New York: Van Nostrand Company, 1984), p. 62.
3. G. Feinberg, The Prometheus Project, (New York: A Doubleday Anchor Book, 1969), p. 222.
4. *Ibid.*, p. 225.
5. C. W. Churchman, The Systems Approach, (New York: Delacorte Press, 1968), p. 105.
6. S. P. Huntington, "The Democratic Distemper," The Public Interest, Vol. 41 (Fall 1975): 9-35.
7. A. M. Farahat, "Behavioral Aspects and Techniques in Environmental Design and Planning," Unpublished Paper, (Blacksburg, Va., Virginia Polytechnic Institute, 1977), pp. 20-28.
8. G. Eckbo, "Art, Science, Technology Democracy and the Landscape," Landscape Planning, Vol. 1, 1974, pp. 51-55.
9. J. G. Fabos, Land Use Planning, (New York: Chapman and Hall, 1985), p. 106.
10. H. Simon, The Sciences of the Artificial, (Cambridge: The MIT Press, 1981), p. 61.
11. R. Kaplan, "Assessing Human Concerns for Environmental Decision Making," in Improving Impact Assessment, Stuart L. Hart, et al., eds., (Boulder: Westview Press, 1984), pp. 37-56.
12. R. H. Giles, Jr., "CAPS-Watersheds: Citizen Objectives for Watershed as Human Living-Space, Note 3," 1983.
13. Of critical importance to the operation of the proposed LAPOS is an understanding of the difference between raw objectives generated in the first phase, and processed objectives, generated in the final product of the system. A list of "raw objectives" is unevaluated and unstructured, whereas a set of "processed objectives" contains objectives that have been rationally evaluated and organized for a specific region, time, and society.
14. In his 1983 study entitled "CAPS: Citizen Objectives for Watershed as Human Living-Spaces," Giles compiled a list which contained more than 300 objectives. He divided them into 28 major groups.
15. M. J. Gannon, Management: An Integrated Framework, 2nd Edition, (Boston, Mass.: Little, Brown and Company, 1982), p. 329.
16. M. K. Tolba, Development Without Destruction, (Dublin: Tycooly Publishing Ltd., 1982), p. 8.
17. Ibn Taimiyya, Ibn Taimiyya on Public and Private Law in Islam, trans. by Omar A. Farrukh (Beirut: Khayats Publishing, 1966), also see As-Siyasah Ash-Shariyah, (Beirut: Dar al-Kitab al Arabi, 1970), pp. 88-90.
18. A. W. Steiss, Models for the Analysis and Planning of Urban Systems, (Lexington: Lexington Books, 1974), p. 183.

19. J. O. Simonds, Landscape Architecture, The Shaping of Man's Natural Environment, (New York: McGraw-Hill Book Company, 1961), pp. 41 and 77.
20. M. M. Hufschmidt (Ed.), Regional Planning, (New York: Praeger Publishers, 1969), p. 10.
21. A. N. Strahler and A.H. Strahler, Elements of Physical Geography, 2nd Edition, (New York: John Wiley & Sons, 1979), p. 203.
22. UNESCO, Development of Arid and Semi-Arid Lands: Obstacles and Prospects, (Paris: UNESCO Press, 1976), pp. 26-34.
23. E. Eckholm and L.R. Brown, Spreading Deserts-The Hand of Man, (Washington, D.C.: Worldwatch Paper 13, 1977), pp. 32-33.
24. Ibid.
25. W. Lee, Formulating and Reaching Goals, (Champaign, Ill.: Research Press Co., 1978), pp. 25-26.
26. Ibid.
27. Fabos, 1985, p. 9.
28. Eckbo, 1974, pp. 51-55
29. O. Faruque, Graphic Communication as a Design Tool, (New York: Van Nostrand Co., 1984), p. 62.
30. E. H. Zube, Environmental Evaluation, (Cambridge: Cambridge University Press, 1980), p. 9.
31. B. Hackett, Landscape Planning: An Introduction to Theory and Practice, (Newcastle upon Tyne: Oriell Press, 1971), pp. 18-24.
32. R. F. Wells, "Application of the Principle of Minimization of the Entropy in the Achievement of Steady State Solutions for Dynamic Systems", (Ph.D. Dissertation, VPI & SU, Blacksburg, Va., 1974).
33. Giles, 1983.
34. Essentially landscape quality is an index to a collection of highly interlocked components that defy partitioning, and hence, any division would be either arbitrary or impractical. Herein is encountered the old debate, that of the "lumpers versus the splitters" in biology and that within the field of planning: Can the parts be known unless the whole is known? Is the long list of landscape objectives a whole or is it only a part? What is a suitable scale for aggregation of objectives? How general? How discrete? This dissertation cannot solve the above dilemma; it is beyond its realm.
35. O. Stuart, Systemic Urban Planning, (New York: Praeger Publishers, 1976), p. 135.
36. R. H. Giles, Jr., and M. J. Sirgy, "A General Systems Perspectives in Setting Objectives for Faunal Systems," Unpublished manuscript, 1985, Dept. of Fisheries and Wildlife, Virginia Polytechnic Institute, Blacksburg, Virginia.
37. For extensive coverage of methods and techniques of environmental impact assessments see D. M. McAllister, Evaluation in Environmental Planning; R. W. Burchell, The Environmental

Impact Handbook ; R. N. Andrews, Environmental Policy and Administrative Change; and many other sources.

38. R. L. Graf and R. H. Giles, Jr., "Calculating the Effectiveness of Fish and Wildlife Planning Regions," Proceedings of Northeastern Fish and Wildlife Conference. (New Haven, Conn., February, 1974), pp. 22-26.
39. W. Lee, Formulating and Reaching Goals, (Champaign: Research Press Company, 1978), p. 31.
40. G. Nadler, The Planning and Design Approach, (New York: John Wiley, 1981), pp. 63-68.
41. Ibid.
42. D. M. McAllister, Evaluation in Environmental Planning, (Cambridge, MA: The MIT Press, 1982), p. 105.
43. Giles and Sirgy, 1985.
44. K. Lynch, Site Planning, (Cambridge: The MIT Press, 1974), p. 278.
45. J. D. Balling and J. H. Falk, "Development of Visual Preference for Natural Environments," Environment and Behavior, Vol. 14, No. 1, pp. 5-28, 1982.
46. E. H. Zube, "Themes in Landscape Assessment Theory," Landscape Journal, Vol. 3, No. 2, pp. 104-110, 1984.
47. Gilbert, p. 25.
48. J. J. Kennedy III, "A Consumer Analysis Approach to Recreational Decisions: Deer Hunter Area Case Study", (Ph.D. Dissertation, VPI & SU, Blacksburg, VA, 1970).
49. P. A. Samuelson, Economics, 10th Edition, (New York: McGraw-Hill Book Co., 1976), p. 561.
50. Ibid., p. 453.
51. Giles and Sirgy, 1985.
52. M. C. Branch, Comprehensive Planning, (Pacific Palisades, CA: Palisades Publishers, 1983), p. 152.
53. McAllister, p. 113.
54. Branch, p. 152.
55. Ibid.
56. Giles and Sirgy, 1985.
57. N. R. Feimer and W. D. Conn, "Risk Assessment and the Public", Unpublished paper, VPI & SU, 1984.
58. McAllister, p. 68.
59. S. Rahman and L. Frair, "A Hierarchical Approach to Electric Utility Planning," Energy Research, Vol. 8, pp. 185-196 (1984).

60. R. H. Giles, "The Crests: A Guidance Document", (VPI & SU, Blacksburg, VA, 1982).
61. Giles and Sirgy, 1985.
62. The concept of weighted importance discussed here is one among several concepts that have challenged resource economists and planners. Other weighting determinants included: non-market as well as market; consumptive-non-consumptive; monetary/non-monetary value; option demand as in the case of speculating on the future possible creation of a market, or on the possible presence of natural resource (i.e., underground aquifers or minerals); enhancement value (land reclaimed and irrigated vs. land that is not); style-related markets (desert camping, safari parks, etc.); value-added problems (imported landscape construction equipment and systems), etc.
63. Churchman, 1968, p. 112.
62. Lee, 1975.

Chapter Seven: Summary and Discussion

An investigation of the state of knowledge, the nature, and the process of formulating landscape planning objectives, coupled with an analysis and assessment of selected development projects in the arid regions of the Middle East, have led the author to many conclusions. Eighteen of these pertain to the field of landscape planning and its applications in the arid Middle East. The remainder pertain to the design of the proposed landscape planning objectives system (LAPOS).

7.1 The Field of Landscape Planning

The term "landscape planning" means different things to different people. Currently it connotes no universally accepted pattern of activities, boundaries, or time. None of the definitions from the literature was comprehensive or precise enough to meet a set of proposed criteria. The following definition has been adopted and used in this dissertation:

Landscape planning is a rational activity and is a component of the comprehensive planning process. It includes four continuing, usually sequential but often parallel tasks: survey, analysis, design, and evaluation. The results of this activity should guide society's actions and aid decision makers in: a) maximizing the use of both natural and cultural resources; b) stabilizing or improving the productivity, beauty, and diversity of the landscape; and c) reconciling the needs of competing land users. Successful landscape planning optimizes the above in time and space subject to retaining potentials and flexibility for future decisions.

A typical difficulty facing the field of landscape planning is that, in contrast to environmental scientists, landscape planners tend to think about synthetic annual scenes rather than real scenes, and attempt to describe landscapes not from the ground but rather from an imaginary position above the ground. However, to be successful a landscape planner must play a dual role. On the one hand,

he or she should be a scientist whose world may have small components, one who seeks a type of control by ignoring all variables but one, one whose primary objective is to understand what exists in the landscape, and one who remains emotionally detached from the landscape. On the other hand, the same landscape planner should stay loyal to the original design paradigm of his or her field. The planner's basic mission is to put things together and to deal simultaneously and concurrently with all of the parts. He or she might be emotionally involved and spiritually attached to the natural and cultural landscape. A planner's primary objective is to prescribe a desired landscape and his utmost dream is to implement that design.

The field of landscape planning suffers from the plight of the clinician. Each situation is unique. There is almost no practical way to obtain large sample sizes appropriate for statistical analyses or scientific validation. There are ethical and other limits to testing many planning hypotheses that can be conducted on human populations. Nevertheless, efforts to understand human systems and to gain predictive power in models over time is a significant task that must be attempted by landscape planning researchers.

For example, total objectivity in evaluating the selected case studies from the arid Middle East was not entirely possible. Not all projects were equal in size, scope, or relative importance. Equal information on each case was not available to the author. However, a general evaluation of each project was made emphasizing how landscape objectives might be derived as well as how the role of the landscape planner might be examined in the regional development process.

7.2 The Arid Regions of the Middle East

After studying the unique issues of landscape planning and development in the Middle East, it became evident that the major challenge to development is aridity. The Middle East includes some of the driest regions on earth. Tens of thousands of people have died from food shortages in Africa

and the Middle East. A major reason for the deaths, which have occurred in different geographical locations, was the phenomenon of desertification, the spread of aridity, which is still dangerously active (1). Most studies suggest that desertification can be technically controlled. Politically, however, there seems to be a lack of adequate commitment to confront this challenge (2).

The survey included in Chapter Five indicates that other problems are also gaining importance. These include population explosion and partial or total loss of land area and quality for production. Loss of land productivity is due to soil erosion, salination, water logging, sedimentation, depletion of plant nutrients, deterioration of soil structure, and pollution. Together, these problems can seriously complicate the already massive challenge facing political leaders, international development experts, and landscape planners. Based on this survey, the author has suggested several related objectives. Similarly, a landscape planner practicing in the Middle East may assist his society in translating their present and future problems into relevant, operational objectives. The arid Middle East was by-passed by the first "green revolution". Despite huge investment in desert reclamation, the region's ability to self sufficient has, in recent years, been declining (3).

A serious problem facing any effort to develop the arid and semi-arid regions of the Middle East is the multiplicity of perceptions and attitudes toward them. To each population, the desert may reflect dissimilar concepts, incompatible norms, diverse criteria, conflicting objectives, and competing courses of action. The method of computing a grand index for each objective, as suggested in this dissertation, offers a solution to this problem. The recommended approach, as described in Chapter Six, may be able to satisfy these diverse interests on rational bases. However, in a few cases, having objectives does not solve problems. Some countries are limited no matter how well stated or well intended their objectives are. There are many good reasons why objectives are not and may never be achieved.

The development of adverse and marginal environments (as the Middle Eastern arid regions) will become increasingly unavoidable as more of these countries find themselves unable to continue the

use of their limited supply of non-arid lands to accommodate growth and demand for food, shelter, and other human needs and activities.

There is a trend of establishing landscape planning-related programs and projects throughout the arid Middle East in the last two decades. Political leaders and administrative staff seem to recognize the above problems and see landscape planning as legitimate functions within the development process.

The governmental agencies and academic institutions that manage and support landscape planning-related projects and programs are very recent phenomena in the arid Middle East. While the nations of that region are currently experiencing a most rapid growth in population, urbanization, and landscape transformation, they are mostly the nations with the least technological and human resources to cope with these changes. Locally trained landscape planners are in short supply in the Middle East. The major decisions related to all of the projects reviewed in Chapter Four were taken by either qualified but foreign landscape planners alien to the Middle Eastern culture and its desert environment, or by native politicians, economists, or scientists. Native landscape planners made very little, if any, contribution to the process of determining and setting landscape objectives or in other aspects of the planning process.

Until now in the arid Middle East, the landscape planning and management efforts have rarely capitalized on the cultural heritage of the Shariah (Islamic Law). So far, the implemented developments may suggest an elitist bias. Their images are those of extravagant luxuries rooted in Western values and/or serving foreign users (See Chapter 5.2.1 Section F, and 5.2.3). These are in contrast to the six principles of Shariah that are relevant to human decisions concerning natural resources and landscape values (4).

Paradoxically, traditional authoritarian leadership in the Middle East has resulted in quickly adopting and implementating enormous landscape planning projects which could have taken decades to pass through the typical Western system of government.

In contrast to Western countries that achieved their development through piecemeal private initiatives and through a reliance on market considerations to allocate their resources, most Middle Eastern governments initiated and managed all landscape planning projects. This situation is ideal on two counts. First, these countries are in a better position for planning and managing because they can avoid the mistakes made by industrialized countries during their earlier uncoordinated stages of development. Second, decisions regarding landscape objectives (i.e., what to do?) and landscape management (i.e., how to do it?) may be centrally determined and implemented much more easily than if many parties are involved.

Finally, just like all other types of development, landscape planning in the arid Middle East is colored by politics. Political circumstances affect to a great degree the types of problems addressed, the analytical methods used, the groups of persons and organizations involved, the kind of decisions taken, and the nature of objectives is declared and ultimately implemented.

7.3 Research into Objectives

That the state of the art and science of developing landscape objectives in its infancy is evident. That it could play an important role in landscape planning may be equally evident. The need for continued research seems equally obvious.

Without moving towards a systematic and comprehensive approach to planning and managing landscape objectives, the current inadequate situation will continue to frustrate the efforts of all involved parties. It is a situation in which a researcher does not reach a conclusion; a planner cannot establish a balanced structure of ideas; a citizen cannot visualize a clear picture for his/her future; and a politician cannot arrive at optimum decisions.

Chapter Five indicates that the lack of an objective-oriented approach to planning and the failure to apply effective methods of developing landscape objectives seem to be major drawbacks in nearly

all of the development projects studied. When one talks about developing a more objective-oriented approach to planning the landscape, this is not advocating a rigid by-the-numbers approach to regional development. Being objective-oriented does not mean being a slave to endless lists of objectives or operating without spontaneity or surprise. On the contrary, the ultimate reward of an objective-oriented planning of the arid Middle East is that it should free these societies from being slaves to the conditions that have been affecting them for centuries. Setting objectives, of course, is not a panacea. It is a skill, a practical skill that can help people in taking more control over their future. The key element in a successful landscape planning effort should be a set of processed objectives. Useful sets of objectives require both reliable measures of their dimensions and valid weights of the relative importance of each of these dimensions. Landscape objectives can best be understood and interpreted by assessing them separately. Each has six dimensions. These dimensions are believed to be: space, time, population, demand, marginality, and a Failure Index. A processed set of landscape objectives that provides for the arraying of all dimensions will be long and complex. It should eventually result in more than a mere rank or priority list of objectives.

Identifying and subsequently measuring the dimensions of landscape objectives provide a means for evaluating objectives occupying relatively similar positions in a list. However extensively the assessment of individual objectives is carried out prior to the making of decision, caution is in order. Comparing landscape objectives on the basis of their six dimensions and relative importance alone is insufficient. Synergy between objectives must, sooner or later, be considered. This is a significant yet invisible force (5). The proposed LAPOS does not deal with this challenging topic. An enormous research effort would be needed to examine this topic in adequate rigor and depth.

The rational paradigm of problem-solving is directly applicable to landscape planning. The planning process, therefore, provides landscape planners and decision-makers with the opportunity to address three basic questions about their region in a way that they cannot in the course of their typical day-to-day operational activities. These are:

- a. What is the present condition of the landscape?, i.e., what is the problem?
- b. What do we wish the future landscape to be?, i.e., what are the alternatives?
- c. Which direction should we pursue first?, i.e., which alternative is best?

Chapters Four, Five, and Six address the three existing approaches to setting objectives. Chapter Five assesses the inductive approach and shows its drawbacks including the lack of public participation, disorganized survey of objectives, and poor assessment of their relative importance. Chapter Four applies the problem-focused approach and demonstrates its advantages over the current inductive approach. However, this approach is judged to be inadequate because the resulting objectives are negatively and retrospectively oriented only. Chapter Six articulates a more comprehensive approach to setting objectives based on a deductive scheme (as suggested by Hackett) and on the assessment of the pros and cons of the other two approaches. The proposed Landscape Planning Objectives System (LAPOS) draws its raw objectives from various sources. Also, its process is more analytical than the two other approaches, i.e., it involves measuring six dimensions of landscape objectives and weighting their relative importance.

LAPOS displays several improvements over existing approaches: a) it responds to the needs of the typical landscape planner and thus makes the task of setting objectives much more manageable than the present situation, b) it requires information which is accessible to the planner from readily available sources such as the relevant public and governmental agencies, c) it provides the landscape planner with a screening method (See Chapter 6.5.2) for sorting out relevant and irrelevant objectives, and d) it provides systematic guidelines for preparing the objectives for public communication.

7.4 Some Ideas for the Future

LAPOS builds on existing methodologies and approaches and on the experience of many people. Also, this approach has not been field tested and should not be treated as a proven technique for preparing landscape objectives. It needs to be tested for comprehensiveness and ability to be implemented in the field and modified to correct problems encountered.

In contrast to various disciplines of science, landscape planning research has no rigid formality. It examines a problem without a fixed paradigm. It welcomes human diversity and landscape complexity, and accommodates the potentials of both multi-disciplinary investigations and interdisciplinary conclusions. The final product of landscape planning should encompass physical designs, i.e., projects and conceptual ideas, objectives, policies, strategies, methods, or programs. In order to build the proposed LAPOS, future research should include the following general areas:

1. extending the approach,
2. computerizing the approach,
3. testing and evaluating the approach, and
4. studying how the approach may be related to other fields and to the comprehensive planning process.

To be more specific, the following detailed tasks seem to be particularly significant:

- Evaluating differences in assessing the dimensions of objectives among people of the arid Middle East.
- Evaluating rates of change in the list of objectives and their dimensions and studying appropriate limits on changing rates.
- Exploring alternative ways of developing objectives.
- Relating landscape planning objectives to other types of objectives.
- Determining alternative ways of correlating objectives.

- Achieving economies in system operation, storing, manipulating, retrieving, and communicating landscape planning objectives.
- Applying and testing techniques such as the Analytic Hierarchy Process in determining weighted importance.

The next few years may be a timely era for landscape planning research. On the whole, the related field of international development is currently in the midst of profound transformation, turning much traditional planning doctrine obsolete. Today, monetary growth is not the only thing for which countries must strive in the mind of most development studies scholars. Modern developments are actions taken to achieve multiple objectives. A genuine student of development, therefore, should strive for a system to state and quantify these objectives.

This research has presented a new way of looking at an old subject: objectives. There is no mystery to the process of creating and managing objectives under the proposed LAPOS. If there will be any significant contribution by this dissertation, it is in explaining to development teams and lay people who are good at formulating objectives, but generally unaware of the actual steps they follow, how to make the task more efficient.

7.5 Limitations of LAPOS

The proposed LAPOS may give the impression of being complex or fanciful, since it is based on suggested techniques that have not yet been jointly applied. It should be noted that all of these techniques are now in use within various typical planning settings. The novelty of LAPOS is in the way the parts of the system are assembled. In implementing LAPOS, it is expected that several basic issues will surface among which are:

- A permanent place within an international agency is needed. Local planning units tend to be unstable because of budgets, perceived roles, and even being a target of people offended by

their potential actions. United Nations Environment Programme, for example, could help facilitating on a regional basis all LAPOS activities in the Middle East.

- Adequate start-up funding is needed. This is not an organization to grow gradually. It needs to be implemented with sizeable investment and allowed to become fully operational immediately. It might obtain full or partial funds from users, but it is almost the perfect public agency justifying public expenditures and not a marketing or sales-for-sustenance rationale.
- Some of the concepts are difficult to explain. An educational program is needed, but some concepts just cannot be taught to the masses. Careful selection of "need-to-know" will be a mass media public project.
- Staffing LAPOS may be a problem. Educational and training units for select personnel can be obtained, however.
- The time required for the representatives to assign numerical values to all of the objectives is long and very tiring. Special sessions, aids, and techniques may be needed.

LAPOS should be used to the extent that it can help landscape planners and leaders reach the stated general goals of their society and not to become an end in itself. Perfectionism is only a fault when the effort expended is out of proportion to the importance of the accomplishment.

The limitations of this dissertation serve to point out areas of additional inquiries that are yet to be answered. In Chapter Six, for example, a central office of public objectives was suggested to oversee the various tasks in LAPOS. There are several problems likely to arise in determining an optimum organization for LAPOS. Should this office be granted autonomy from the regional agency responsible of landscape planning or is a hierarchical structure to be preferred? What should be the duration of time of the central office of public objectives? And there are many other related questions.

Some researchers suggested that an ideal system of landscape objectives should include some type of a formula employing numerical values. Such an ideal system does not exist but it can be approximated. This dissertation has been based on this belief. The grand index computed for each

objective within LAPOS is a demonstration of this position. Nevertheless, mathematics does not explain any phenomenon (an objective or otherwise); it just describes it more effectively than words or graphics.

Landscape planning objectives are always present, whether explicit or implicit. The planner must realize that the shape of the future natural and cultural landscapes can be determined, even unknowingly, in the implicit judgements that a leader integrates into his or her decision-making process. Therefore, the decisive role that an explicit set of objectives could play in such contexts is self-evident. This is the ultimate contribution of LAPOS in developing the arid Middle East.

Footnotes

1. P. Psomopoulos, "Desertification and Human Settlements", *Ekistics*, Athens Center of Ekistics of the Athens Technological Organization, Vol. 43, No. 258 (May 1977), pp. 245-248.
2. There is almost unanimous agreement among scholars of arid land studies on this point. See for example: UNESCO, *Case Studies on Desertification*, 1980; Glantz, *Desertification: Environmental Degradation in and around Arid Lands*, 1977; and others. In their book, *Spreading the Desert: The Hand of Man*, 1977, Eckholm and Brown state:

The negative environmental trends called desertification are widespread, long-standing, and in many cases, accelerating. The technologies needed for reversing them are for the most part already available. Too commonly lacking, however, is a political commitment to the reversal of desertification commensurate with the size of the challenge.

3. The "Green Revolution" is a popular term that refers to the 1960's agricultural breakthrough in which such new strains as Mexican dwarf wheat and the IR8 strains of "miracle rice" helped avert mass starvation in Asia and Latin America.
4. A few authors (Llewellyn, 1980; Bakader et al., 1983; Serageldin, 1934; and Manzoor, 1984) have examined the influence of Islam on the concept of nature and resource management. Their writings show a distinct pattern given by Shariah. This pattern consisted of the following principles:
 - A belief in God's ownership of the universe and the economic trusteeship of humans.
 - A belief that the world was created for humans to use, to transform, and to enjoy. However, these and all other human activities are conditioned by the permanent needs of society.
 - The judgement of actions is not drawn in the light of simplistic mathematical formulas and production capacity. It is rather drawn and conceived in the light of a comprehensive system of values and facts.
 - To realize the ideals of Sharia and its economic justice, certain institutions should be established. Historically, these included ihya (land reclamation), igta (land grants), ijarah (lease of public land, hima (protected lands), awgaf (charitable lands), and hisbah (the office of public inspection and land management).
5. Ecologists have defined synergy as the interaction in which the total effect in nature is greater than the sum of the effects taken independently. In the case of landscape planning, progress toward an objective may either facilitate, interfere with, or be indifferent to the attainment of some other objectives. There relationships can either be negative in the case of a conflict, positive in the case of an overlap, and neutral in the case of unrelatedness. Objective interrelationships are identified using paired comparisons. Fundamentally, the landscape analyst investigates whether the interrelationship between objective x and objective y is an unfavorable (i.e., conflict), favorable (i.e. overlap), or does not interact at all. A favorable interrelationship indicates objectives which could be pursued simultaneously. An unfavorable interrelationship indicates conflicting objectives. Such a condition calls for considering objective substitution, abandonment, or modification.

Appendix A.

Giles' Sectoral Typology of Objectives in Wise County, Virginia

1. Community Identity
2. History
3. Cultural Development
4. Religion
5. Esthetics and Beautification
6. Landscaping and Vegetations
7. Open Space
8. Ownership
9. Organization and Operation
10. The People
11. Health
12. Education
13. Security and Justice
14. Recreation and Leisure
15. Employment
16. Safety
17. Fire Control
18. Civil Defense
19. Industry, Commerce, and Finance
20. Food and Nutrition
21. Social Services
22. Communications
23. Taxation and Finance
24. Transportation
25. Utilities and Energy
26. Waste
27. Living Spaces
28. Land Use

Appendix B.

The Declared Management Objectives of Asir National Park

The management objectives listed represent desired conditions to be achieved in order to fulfill the purpose of the park. The objectives provide a framework that enables management to design operation, development and maintenance programs, as well as a standard by which to assess the progress of these programs.

Boundaries - To include within the park boundaries representative portions of the Asir landscape, from the western crest of the Arabian Shield through the highest and most scenic portions of the Sarewat Range, to and including the coral reefs and offshore waters of the Red Sea, and to adjust these boundaries when required to better realize the purpose of the park.

Land Classification - To classify and manage all parklands for their highest and best use in achieving the park purpose and objectives.

Wildlife - To protect and manage the native wildlife of the Asir and, where feasible, reintroduce native species that have been eliminated from the region, and to provide for the enjoyment of wildlife by park visitors.

Plant Life - To manage the native plant life in each of the park's land classification units to best carry out the intent of each unit, and to identify and give particular management attention to plant species and associations that are endemic or which require special protection to assure continuation.

Research - As a major addition to the national parks and equivalent reserves of the world, to conduct needed research that will help management realize the park purpose and objectives; and to encourage and support, to the extent possible, research into the geologic, biotic and cultural resources of the Asir by scholars from around the world.

Agriculture and Pastoral Use - To continue, within certain portions of the park, agricultural and pastoral uses by the people of the Asir on lands classified for that purpose, in order to perpetuate the cultural heritage and to make it a part of the visitor's enjoyment of the park.

Cultural Resources - To identify, inventory, and appropriately protect the cultural resources, archeological and historical, within the park; and to provide for their enjoyment without impairment by the park visitor.

Visitor Use - To provide the facilities, services and use opportunities to permit a varied, year-round program of visitor use that will encourage and permit a variety of uses within the park, deriving their meaning primarily from association with park resources.

Information - To provide information to the visitor at strategic entry and concentration points on the use opportunities in the park, on park regulations and restrictions, and on services and such equipment and supplies that may be necessary for such uses.

Interpretation and Education - To provide facilities, personal services, literature and other media to inform the visitor of the park's resources, their significance, and the effect of mankind's actions upon them.

Access and Circulation - To provide access and circulation within the park having minimum visual impact and causing minimum physical and biological disturbance to park resources.

Park Facilities - To provide only those facilities in the park necessary to carry out the approved visitor use program; for visitor protection, and those park management activities that must be carried out within the park. Management facilities not required on site, such as staff housing, headquarters and maintenance facilities, will be located centrally.

Visitor Facilities on Non-Park Land - To encourage, under appropriate Government regulations, the provision of visitor accommodations and services in the vicinity of the park.

Concessions - To provide concession facilities in the park when they are necessary to fulfill the park purpose and management objectives, when they cannot adequately be provided outside the park.

Design and Construction - To assure quality design and construction of all park facilities, including structures, roads and trails, etc., in harmony with the park environment.

Maintenance - To provide adequate equipment and trained staff necessary to realize long life of park facilities, and to keep them clean, sanitary and safe for use by visitors.

Appendix C.

The Declared Governmental Objectives of Asir National Park

The Asir Kingdom Park is a prototype for what may develop into a system of Kingdom Parks and related reserves established to identify and protect for the enjoyment of the Saudi people significant scenic, natural, cultural, and recreational resources of the Kingdom. To assure that the Kingdom Park fits into such a scheme, and to assure that its development and management will be in concert with other activities of the Government of Saudi Arabia relating to the development and security of the Kingdom. Its planning and development should conform to a suggested "Policy for Kingdom Parks, Related Reserves, and Antiquities."

**The vita has been removed from
the scanned document**