INDIGENOUS INSTITUTIONS: A RESOURCE FOR ENVIRONMENTAL IMPACT ASSESSMENT AND PLANNING IN GHANA

by

Seth Appiah-Opoku

A thesis
presented to the University of Waterloo
in fulfilment of the
thesis requirement for the degree of
Doctor of Philosophy
in
Regional Planning and Resource Development

Waterloo, Ontario, Canada, 1997

© Seth Appiah-Opoku 1997

National Library of Canada
Acquisitions and Bibliographic Services
395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale du Canada
Acquisitions et services bibliographiques
395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-22188-1

Canada

The University of Waterloo requires the signatures of all persons using or photocopying this thesis. Please sign below, and give address and date.

ABSTRACT

The thesis traces the evolution, procedure and constraints to environmental assessment in Ghana. It also reviews development paradigms and planning theories pertaining to environmental decision-making and demonstrates the need for planners to respond to specific conditions in different parts of the world with appropriate planning theories and concepts. A contentious issue is the need to explore and incorporate relevant aspects of indigenous institutions and practices in environmental impact assessment and planning in developing countries.

Focusing on Ashanti Region of Ghana, the thesis discusses the nature and operation of indigenous institutions and in particular, their ecological knowledge, beliefs, practices, and social norms that are relevant to environmental assessment and planning processes in the country. These aspects of indigenous institutions not only have the potential to complement western scientific knowledge in a way that would improve environmental impact assessment studies and planning but also encourage local participation and bottom-up approaches to environmental and planning decisions.

The thesis highlights specific avenues for incorporating indigenous knowledge in environmental decision-making and planning. There is the need to establish assessment and cooperative management boards that would include representatives of indigenous institutions. In addition, the development of technical dictionaries and training manuals or modules based on indigenous ecological knowledge and practices could improve assessment and planning processes in Ghana.

Constraints to the integration of indigenous and western scientific knowledge systems are discussed. One of the key constraints is the rapid and continuing loss of indigenous knowledge, in part due to the spread of a global consumer culture and the effects of western education on younger generations. If indigenous knowledge is to be preserved and passed from generation to generation, it will have to be recognized by the institutions of power and influence. Planners and policy makers would have to learn that indigenous knowledge is not just a relic of the past but is something that is important now and will be worth having in the future. In this sense, the integration of indigenous knowledge in assessment and planning processes may become part of the solution. Other constraints include: (a) the difficulty in changing entrenched attitudes of bureaucrats and politicians; (b) powerful internal and external forces; (c) ignorance, illiteracy, and linquistic barriers; and (d) lack of systematic records and common measurements for indigenous knowledge systems.

Thus, the integration of indigenous and western scientific knowledge systems in environmental impact assessment and planning may require structural changes, as well as changes in the attitudes and perceptions of most planners, governments and policy makers in both developing and developed countries. Moving toward decentralized decision-making, efficient communication, the restoration of participatory democratic institutions and the guarantee of basic human rights would facilitate the incorporation of indigenous knowledge system in environmental assessment and planning.

ACKNOWLEDGEMENTS

I thank God for the strength and wisdom to undertake this study without price. I cannot be thankful enough for the fortune of being able to undertake PhD studies against many odds. For instance, in the course of writing this thesis, I sustained soft tissue injuries in two motor vehicle accidents and this reduced the pace of my academic work.

I appreciate having as my supervisor and advisor, Professor George Mulamoottil, who guided me patiently and thoroughly through each stage of my PhD studies. His enthusiam, financial support, and encouragement throughout the period helped me to publish three papers in highly reputable international journals and contributed immensely to the successful completion of this thesis. Other members of my thesis committee were Professors Bob Gibson, B. Hyma, and Ross Newkirk. They offered encouragement, creative advice and guidance. I thank them for sharing their time, ideas and reference materials with me whenever I approached them for assistance. As my career unfolds, I would always remember the contribution of my thesis committee members.

I am grateful to Dr. P.C. Acquah, J. Allotey, Osei-Amoyaw, and Mrs. Adarkwa Dadzie of Ghana's Environmental Protection Agency, Accra, for their cooperation and assistance during my field work in Ghana. Professors Alex Asiedu and Kojo Amanor of University of Ghana, Legon, provided advice and guidance during the field work. In the same vein, Professors S.K. Afrane, Mensah Aborampah, and K. Adarkwah of the Planning Department, University of Science and Technology, Kumasi, Ghana, were very helpful. I thank them all.

Six research assistants conducted part of the interviews and travelled the length and breadth of Ashanti Region with me. They include: Mr. F.A. Codjoe, a headteacher at Juaben Ashanti; Mr. P.K. Kusi of Krapa Junior Secondary School, Ejisu; Mr. Akwasi Dade of Mfensi Junior Secondary School; and three students from the University of Science and Technology, Kumasi, Ghana. I salute them for their enormous sacrifices and contribution to this study.

My deepest gratitude goes to the International Development Research Council (IDRC) in Ottawa, without whose financial award my field work in Ghana would not have been possible. Ms. Rita Bowry, a program officer of the IDRC, administered the award quite efficiently. I thank her for the advice and moral support. I also thank the School of Urban and Regional Planning and the Graduate Studies Office at University of Waterloo for the opportunity and financial assistance that enabled me to pursue PhD studies at the time when government budget cuts in Ontario had reduced educational opportunities for most Ontarians.

I cannot forget Mrs. Edie Cardwell, the graduate secretary at the School of Urban and Regional Planning. On numerous occasions that I approached her for answers to puzzling academic inquiries, she proved to be a great asset to the School of Urban and Regional Planning. I thank her from the bottom of my heart. I thank my colleagues Mrs Linda Hayward, Alice Nabalamba, Raymond Asomani-Boateng, and Gunnar Hillgartner for their occasional assistance and company. Finally, I congratulate my wife, Augustina, and our three children (Fred, Stacey, and Seth Jnr.) for their patience and endurance throughout the period that I stayed away from home in order to accomplish this task.

TABLE OF CONTENT

Abstract iv
Acknowledgements vi
Table of Contents viii
List of Tables xi
List of Figures xii

CHAPTER ONE: RESEARCH BACKGROUND 1
1.0 Introduction 1
1.1 Conceptual Framework 3
1.1.0 The Concept and Theories of Development 4
1.1.1 Economic Growth & Modernization 5
1.1.2 Dependency 8
1.1.3 Basic Human Needs 9
1.1.4 Self-Reliance and Popular Participation 10
1.1.5 Alternative Development 11
1.1.6 Environmental Sustainability/Justice 13
1.1.7 Summary 14
1.2 Defining Indigenous Institutions 14
1.3 Indigenous Knowledge 17
1.4 Rationale for the Study 23
1.5 Overview of Ghana--A Brief Geography, History, and Culture 26
1.6 Study Area--Ashanti Region, Some Background Information 30
(a) Biophysical Characteristics 31
(b) Economic Characteristics 35
(c) Social Characteristics 36
1.7 Outline of the Thesis 37

CHAPTER TWO: THEORETICAL ORIENTATIONS OF ENVIRONMENTAL IMPACT ASSESSMENT: IMPLICATIONS FOR DEVELOPING COUNTRIES . . . 38
2.0 Introduction 38
2.1 The Concept of Environmental (Impact) Assessment 38
2.2 Planning Theories Underpinning Environmental Impact Assessment 43
2.2.1 Synoptic/Rational Comprehensive 45
2.2.2 Incremental 46
2.2.3 Advocacy 47
2.2.4 Transactive 49
2.2.5 Social Learning 50
2.3 Applying Planning Theories to Environmental Impact Assessment in Developing Countries 52

2.3.0 The Case of Ghana: Environment and Development Policies 54
2.3.1 Evolution of Environmental Impact Assessment in Ghana 56
2.3.2 Environmental Impact Assessment Procedure in Ghana 61
2.4 Summary 65

CHAPTER THREE: FIELD RESEARCH AND DATA COLLECTION METHODS 67
3.0 Introduction 67
3.1 Scope of the Research 67
3.2 Research Objectives 68
3.3 Key Research Questions 68
3.4 Designing Interview Guides 69
3.5 Field Research Methods 70
3.6 Data Presentation 74
3.7 Limitations of the Research 76

CHAPTER FOUR: RESEARCH FINDINGS 81
4.0 Introduction 81
4.1 Indigenous Social Institutions 82
4.1.0 Kinship System 83
4.1.1 Clan and Family System 83
4.1.2 Indigenous Land Tenure System 85
4.1.3 Indigenous Religious Beliefs and Practices 86
4.1.3.1 The Supreme Being (God) 87
4.1.3.2 Ancestral Influence on the Living 87
4.1.3.3 Divinities and Spirits 89
4.2 Indigenous Political Institutions 91
4.3 Indigenous Judicial Institutions 94
4.4 Indigenous Economic Institutions 96
4.4.0 Indigenous Healing Practices 96
4.4.1 Indigenous Farming Practices 103
4.4.2 Indigenous Hunting and Gathering Practices 110
4.5 Environmental Problems and Constraints to Environmental Impact Assessment in Ghana 114
4.6 Summary 122

CHAPTER FIVE: DISCUSSION OF FINDINGS 124
5.0 Introduction 124
5.1 Potential Contribution of Indigenous Institutions to Environmental Impact Assessment (EIA) and Planning 124
5.2 Incorporating Aspects of Indigenous Institutions in EIA and Planning: Opportunities and Constraints 136
5.3 Implications for Ghana's EIA Procedure 147
5.4 Summary 153

CHAPTER SIX: SUMMARY AND CONCLUSIONS 155
6.0 Introduction 155
6.1 Key Characteristics of Indigenous Institutions in Ghana 155
6.2 Indigenous Beliefs, Social Norms, and Practices Relevant to EIA and Planning 157
6.2.1 Indigenous Beliefs 157
6.2.2 Social Norms 158
6.2.3 Environmental Conservation Practices 158
6.2.4 Indigenous Ecological Knowledge 159
6.2.5 Potential Contribution of Indigenous Institutions 160
6.3 Conclusions 160
6.4 Directions for Future Research 162

Literature Cited 164
APPENDICES 183
Appendix A: List of Undertakings Requiring Mandatory EIS in Ghana 183
Appendix B: Sample of Public Notice Under Ghana's EIA 186
Appendix C: Sample of Interview Guides 187

List of Tables

Table 1.1 Characteristics of Indigenous and Non-indigenous Institutions 16
Table 1.2 Indigenous Knowledge and Western Scientific Knowledge Compared 19
Table 2.1 Status of EIA in Developing Countries 55
Table 3.1 A Framework for Data Collection & Analysis 75
Table 4.1 Age-Gender Distribution of Elders 82
Table 4.2 Age-Gender Distribution of Healers 97
Table 4.3 Educational Status of Healers 100
Table 4.4 Number of Plant Species used by Healers 101
Table 4.5 Age-Gender Distribution of Farmers 104
Table 4.6 Educational Status of Farmers 104
Table 4.7 Age-Gender Distribution of Hunters 110
Table 4.8 Educational Status of Hunters 111
Table 4.9 Age-Gender Distribution of Key Government Officials & Other Respondents 115
Table 4.10 Educational Status of Key Government Officials & Other Respondents 115
Table 4.11 Disciplinary Background of Key Government Officials & Other Respondents 116
Table 4.12 Key Environmental Problems in Ghana 116
Table 4.13 Key Constraints to EIA Practice in Ghana 119
Table 5.1 Integrating Indigenous Knowledge in Ghana's EIA Process 152
Table 6.1 Summary of Findings--Key Characteristics of Indigenous Institutions in Ashanti Region of Ghana 156

List of Figures

Figure 1.1 Map of Ghana: Vegetation Zones 27
Figure 1.2 Map of Ghana: Administrative Regions 29
Figure 1.3 Map of Ghana: Ashanti Empire and Influence 32
Figure 2.1 Map: EIA Systems Worldwide 40
Figure 2.2 A Flow Chart of Ghana's EIA Procedure 62
Figure 3.1 Map of Ashanti Region: Showing Areas Surveyed 72
Figure 4.1 Photograph: Lake Bosomtwi at *Kuntanase* near Kumasi 90
Figure 4.2 Photograph: A Traditional Chief 93
Figure 4.3 (a) Photograph: A Traditional Priest Possessed by deity 99
(b) Photograph: A Traditional Priesthood Dancing 99
Figure 4.4 Photograph: Centre for Scientific Research into Plant Medicine 103
Figure 4 5 Photographs: Indigenous Farmer Using the Slash-and-Burn Method 106

Chapter One

RESEARCH BACKGROUND

1.0 Introduction

Most developing countries are implementing institutional frameworks for environmental policy that are based on Western European and North American models, and often with funding from donor nations (Amanor, 1994). The adoption and promotion of donor policies often hinders the positive contribution of indigenous systems to the development process. Therefore, policy makers in these developing countries are drawn towards international environmental prescriptions that have much stronger linkages with Western science and policy than with the socioeconomic and institutional conditions in their countries. The potential contribution of indigenous institutions to environmental assessment and planning in developing countries is often overlooked or undervalued.

The Western concept of "development" is widely interpreted as necessitating change, and it is often characterized as a movement from the **old** to the **new** or from **traditional** to **modern** ways of life. Based on this notion, indigenous institutions and life-styles are often regarded as symptoms of underdevelopment and obstacles to socioeconomic advancement. Thus, they are erroneously viewed as excessive baggage that is borne by society with no relationship to its basic processes of self-preservation except insofar as it disrupts them (Dove, 1990).

The views of indigenous people about nature have too often been unjustly considered as somehow inherently simple, primitive, or naive; reflective of an earlier and therefore inferior stage in human cultural progress; and beyond this, however poetic or endearing, as completely irrelevant to our sophisticated modern needs and times (Knudtson and Suzuki, 1992). Accordingly, one covert aspect in development planning, policies, and practices in modernizing institutions is the depreciation and attempted alteration of indigenous cultures and life-styles (Dove, 1990).

In reality, as will be noted in Section 1.1.0, development does not mean a wholesale and blind acquisition of symbols or signs of modernity. Nor does it imply that everything about indigenous life-styles must be rejected in favour of a foreign or modern system. One of the catalysts to spark the international surge of interest in indigenous ecological knowledge and environmental resource management practices was the 1980 World Conservation Strategy (WCS). Part of the strategy to achieve sustainable development[1], suggested by WCS, is to recognize indigenous systems as sources of ecological information and to involve local people directly in the management of natural resources (International Union for the Conservation of Nature, 1980). The recommendations of the WCS were further echoed in the publication of *Our Common Future* (World Conservation on Environment and Development, 1987). The report calls for the development of a science based on the priorities of local people and the creation of a technological base that blends both indigenous and modern approaches to problem-solving. Although these reports have been criticized on several grounds, they have succeeded in drawing attention to the potential role

[1] Defined as "development that meets the needs of the present generation without compromising the needs of future generations" (WCED, 1987).

of indigenous people in environmental management.

A similar call was also made at the 1992 Earth Summit in Rio de Janeiro. Critical to the successful implementation of principles enshrined in the Rio Declaration, especially Agenda 21, is the recognition of the contribution of indigenous peoples and their ecological knowledge systems (Keating, 1993). In this regard, we must reevaluate the relevance of native or indigenous institutions and their knowledge systems to our spiritually and environmentally turbulent modern lives, and in recognizing their intrinsic value, take immediate actions to honour and protect them around the world (Knudtson and Suzuki, 1992).

1.1 Conceptual Framework

What is it about indigenous institutions that needs to be explored in order to explain their potential role in environmental assessment and planning in developing countries? To answer this question meaningfully, one has to establish a conceptual framework that gives some insight into the complex development problems in developing countries and the need to harness available local resources, knowledge and technology for national and regional development.

Against this background, this section reviews development concepts and theories that have historically been applied in one form or another in developing countries with little or no success, as well as new or emerging development paradigms that offer a gleam of hope. The review will inform how the objectives of the thesis may be perceived and interpreted.

1.1.0 The Concept and Theories of Development

According to Bryant and White (1982), development is one of the most compelling concepts of our time. It provokes painful questions about values, techniques, and choices. It raises anew the classical query about the nature of the "good" society, as well as the problem of who is to decide on society's content and course. Because these are large and difficult problems, it is easy to lose them in generalizations, using the term "development" as a euphemism for change, modernization, or economic growth. Development is more complex than any of these words suggest.

Development is a multidimensional process involving major changes in social structures, popular attitudes and national institutions as well as the acceleration of economic growth, the reduction of inequality and the eradication of absolute poverty. The process is expected to balance socio-cultural, economic, political, and environmental needs of a population in an attempt to provide for their basic material and non-material needs. The goal of development is the realization of human potential and the overall improvement of life whilst safeguarding the environment (Gandhi, 1968). The United Nations Development Program's *Human Development Report* (1990) elaborates on the essential components of development as follows:

- **Improved life sustenance:** this implies the ability to provide for such basic necessities of life without which life would be meaningless. These include food, shelter, clothing, and health.
- **Equity issues:** this deals with distributional issues. For instance, no matter how fast an economy grows, if only a small segment of the population benefits from it, development has not occurred. There is the need to reduce inequalities among the inhabitants in a given economy.

- **Empowerment:** development entails acquiring leverage for the poor. The only way to have a built-in mechanism for correcting grossly unfair allocation decisions is for people, especially the marginalized, to have influence and use it to raise their concerns onto the public agenda and to participate in the decision-making process.

- **Sustainability:** implies that development should be in harmony with the environment in both the short and long-run. The finiteness of natural resources requires society to consider the prospects for a sustainable future. This requires socio-economic and political sustainability.

Thus, development is seen as an ongoing process of positive structural changes in socio-economic, cultural, political, and institutional aspects of life that are in harmony with all other elements of sustainability. In this sense, development must be conducted in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987).

In simple terms, development is defined as a series of quantitative and qualitative changes occurring among a given population and the converging effects indicate in time, a rise in the standard of living and other favourable changes in their way of life (Dorvlo, 1980). In trying to achieve this objective, underdeveloped countries have adopted policies and programs that are based on Western development paradigms such as *Growth and Modernization*, *Dependency*, *Basic Human Needs*, and *Alternative Development*. A brief review of the theories may provide a conceptual basis for this thesis.

1.1.1 Economic Growth and Modernization

This was a popular development paradigm in the 1950s and 1960s. It focused on the concept of *stages of economic growth* in which the process of development was viewed as a series of pre-

determined successive stages that all countries experience with time (Rostow, 1960; Thronton, 1982).

One of the proponents of economic growth and modernization paradigm was Walt Rostow (1960). Writing in the early 1960s, Rostow made a number of judgements about the world economy, the most influential of which was his "stages of growth" approach to development. He argued that all societies have to pass through five stages of economic growth, namely: (a) the traditional society; (b) the pre-condition for take-off; (c) the drive to maturity; and (d) the era of mass consumption. Underdeveloped countries were linked to the traditional society stage in which science and technology are at their primitive, backward or subsistence stage. On the other hand, developed countries were said to be in the era of high mass consumption. How then could underdeveloped countries take-off to the era of high mass consumption and join the community of full-fledged developed countries?

In economic sense, the paradigm proposed mechanization, rapid industrialization and growth; in the social sense, its objectives were defined as increasing individual mobility and establishing procedures for equitable resource allocation. Social change and education were important targets but the focus on these issues tended to overlook the role of traditional or indigenous institutions and their norms. In political sense, modernization implied concentration of power, emergence and expansion of a modern bureaucracy along the lines of those in Western industrialized countries (Huntington, 1971; Higgott, 1983; Gendzier, 1985; Chazan et. al., 1985).

Unfortunately, underdeveloped countries did not seem to have the necessary pre-requisite for modernization. The economic legacy of colonialism had damaged the prospects of industrialization in most underdeveloped countries. This is because the economic task under colonial governments was to get raw materials out of underdeveloped countries and into metropolitan countries. Ports, roads, and some railroads were built to attain this objective. For several decades, most underdeveloped countries served as hunting grounds for corporate adventurers who took out a great deal of resources and profits and left behind poverty and resentment. The kind of economies that were left behind by colonial powers were largely devoid of industrial pre-requisites and practices except for limited transport networks (Anderson, 1971). As a consequence, the establishment cost for new industries in underdeveloped countries, in the area of infrastructure alone, tends to be much higher than those in the developed countries. Coupled with this problem is the absence of indigenous entrepreneurs with sufficient accumulated capital to initiate industrial enterprises (World Bank, 1981).

Foreign aid and investments in the form of capital, manpower, and modern technology were seen as the stimuli required to propel economic growth in underdeveloped countries (Pekurel, 1987). Unfortunately, foreign aid and investment have distorted the development process in underdeveloped countries in directions that are based on external prototypes which are often inappropriate or damaging to recipient economies (Bauer, 1985). This has kept most underdeveloped countries in perpetual poverty and indebtedness. Consequently, the utility of the growth and modernization paradigm, as a strategy for development in underdeveloped countries, was questioned particularly in Africa which was frustrated by its incapacity to progress toward

a desired goal of societal betterment (Chazan et. al., 1992).

1.1.2 Dependency

The dependency paradigm offers some insight into the constraints to development in less developed countries. It emanated from debates over the reasons for underdevelopment in colonized and newly independent countries (Perkurel, 1987). In sharp contrast to modernization paradigm, dependency focuses attention on identifying the root causes of underdevelopment. The basic argument by dependency theorists is that underdevelopment is conditioned by the development and expansion of the economies of developed countries to which underdeveloped countries are linked as a result of the world capitalist system (Prebisch, 1950; Sunkel, 1969; Furtado, 1973; Dos Santos, 1970; Roxborough, 1979).

The central theme of dependency paradigm is that underdevelopment is a product of an historical pattern of exploitation of impoverished countries by more wealthy ones and that the link between underdeveloped countries and their developed counterparts has worked in favour of the latter (Amin, 1987). In this relationship, the developed world operates like a pumping machine, drawing from the undeveloped countries the very resources that put the former ahead in terms of development (Chazan et. al., 1992). Underdeveloped countries produce mainly labour-intensive primary raw materials for exports at cheaper prices. In return, they import capital intensive products in the form of industrial goods, technology, and skilled manpower at higher costs. This often results in perpetual unfavourable terms of trade; a process which Amin (1987) refers to as an "unequal exchange".

In addition, cultural ties established through colonialism are said to have resulted in a new national elite in underdeveloped countries who, unable to identify themselves properly with local values, norms, and tradition, prefer to measure their success and status in society by acquiring sophisticated taste, preferences, and life-styles of foreign origin. The result has been local elites' denial of all that is good in local or indigenous culture in favour of foreign lifestyles (Roxborough, 1985; Ameyaw, 1987). In this sense, the elite in less developed countries frequently hold a vested interest in underdevelopment through their economic ties with the corporate system (Harrington, 1968).

As a solution to the problems with dependency, adherents of the paradigm often highlight the need for indigenous solutions to development problems in underdeveloped countries. The basic human needs and self-reliance paradigms point toward this direction and were therefore embraced by policy makers in less developed countries by the mid-1970's.

1.1.3 Basic Human Needs

The Basic Human Needs paradigm was introduced by the International Labour Organization in 1976 and calls for a balance in national plans between the emphasis on economic growth and improvements in the quality of life of citizens, especially the poor and marginalized (Streeten, 1984). The central theme of the paradigm is that a realistic development requires the fulfilment of basic individual and collective necessities such as food, shelter, health, and security. With the satisfaction of these basic needs, it is hoped, people would progressively achieve the social and material conditions which determine their life, work, and environment (Litsios, 1977).

However, several questions about the basic human needs paradigm remain unanswered. For instance, who determines basic needs? Should the objective of meeting basic human needs be an end in itself or as an instrument for developing human resources? It is sometimes argued that the paradigm conceals a call to revolution (Streeten, 1997). For this reason, it needs further conceptual refining to attain optimal effectiveness in underdeveloped countries (Pekurel, 1987).

1.1.4 Self-reliance and Popular Participation

The modern world first witnessed self-reliance practised in India at the time of Mahatma Gandhi, and China under Mao ZeDong. However, the concept was brought to greater prominence in the international scene by the non-aligned nations at their 1970 meeting in Lusaka. The non-aligned nations proposed a fundamental structural transformation in national policy, leading to a complete withdrawal from the international economic order (Pekurel, 1987).

In its rudimentary form, self-reliance as a development strategy requires inhabitants of a defined area to cooperatively undertake the building and rehabilitation of their community using their own efforts and resources (Frank, 1969; Gaulting 1980; Kolo, 1986). Development action is often called for at the local or grassroots level. Self-help, local resources and initiatives, and local leadership are the major instruments in this process (Matowanyika, 1991). Thus, the paradigm encourages the use of indigenous knowledge and local cultural attributes in development planning.

1.1.5 Alternative Development

Alternative development aims at improving the conditions of life and livelihood for the excluded majority, whether on a global, national, regional, or local scale (Hettne, 1982; Friedmann, 1992). It is the brain child of an "invisible college" of international development specialists who were frustrated by the mainstream theories of development which emphasized economic growth and a single-minded pursuit of industrialization. These specialists succeeded in formulating principles that they hoped would lead to a simultaneous improvement in the conditions of the poor and the marginalized (Drabek, 1987). According to Friedmann (1992), these principles include the following:

- permitting the poor to acquire the power and control over their own lives and the natural and human resources that exist in their environment;
- strengthening the inherent capability of the poor to define development goals, draw up strategies for self-reliance and be masters of their own destinies;
- refusing to compromise on issues related to the social and cultural identity of indigenous, native, or poor societies;
- placing special emphasis on utilizing and developing the indigenous efforts that enhance self-reliance; and,
- recognizing that all development efforts must include women as equal partners.

In this sense, the alternative development paradigm places emphasis on empowering the poor and marginalized to enable them take active control of their lives (Barimah and Nelson, 1994). A basic assumption in the empowerment literature is that certain groups in society are marginalized because they are powerless or lack the capacity to influence official decisions irrespective of their potential contribution to societal goals and aspirations (Harold, 1991).

Empowerment approach to development places emphasis on autonomy in decision-making of territorially organized communities, local efforts, participatory democracy, and experiential learning (Friedmann, 1992).

Torre's (1986) themes characterizing the empowering process could guide both planners and the marginalized to pool their strengths together for development. The themes include: (a) development of critical consciousness; (b) co-operative group efforts to influence change; (c) skill development; (d) recognition from others. Developing critical consciousness entails awareness of injustices, oppression, and the way in which power structures are maintained; co-operative group efforts are seen in mediating structures such as consumer, neighbourhood and community organisations; skills development leads to a sense of personal value and self-esteem; and, the recognition from others that personal knowledge and experience are valid and useful also leads to a sense of personal value and self-esteem (Freire, 1970; Gaventa, 1980; Harold, 1991).

A basic condition for participation of the marginalized in decision-making and problem solving is the development of their confidence and capacity for participation (Kolo, 1986). This entails empowerment especially in the development of their skills, critical consciousness, and co-operative group efforts. These increase the ability of the marginalized to have influence and to raise their issues onto the public agenda (Bryant and White, 1982).

1.1.6 Environmental Sustainability/Justice

Every generation receives a natural and cultural legacy in trust from its ancestors and holds it in trust for its descendants. This trust imposes upon each generation the obligation to conserve the natural environment and cultural resources for future generations (Weiss, 1990). Thus, justice or equity is an issue within the territory of development planning. In this sense, theories of environmental justice, particularly, justice *within* the environment and justice *to* the environment may be helpful (Gleeson and Low, 1997). According to Gleeson and Low (1997), justice *within* the environment relates to the distribution of environmental quality within human populations. It goes beyond the tolerance of differences and advocates a proactive stance in environmental impact assessment and planning. It requires the culture of listening, understanding, and fostering others experiential knowledge, and could therefore guide environmental planners to integrate indigenous systems in EIA and environmental management.

Similarly, justice *to* the environment is concerned with the relationship between humanity and nature. It is about the recognition of the duties towards nature and ethics of nature and respect (Rolston, 1989). It gives rise to a philosophy that links humans directly to nature and makes them part of it, not over and against it (Schulkin and Sarokin, 1996). This is based on the assumption that part of our humanity is the connection with nature and therefore, there is the need to confront human values and practices that degrade the environment. Thus, this theory could guide development planners to recognize indigenous belief systems, norms and practices that incorporate respect for nature--both animate and inanimate.

1.1.7 Summary

The foregoing discussion is about failure and a gleam of hope. The failure is that of mainstream development paradigms such as *modernization, dependency,* and *basic human needs* to address poverty and environmental sustainability issues in underdeveloped countries, particularly those in Africa. The gleam of hope is the emerging practice of the alternative development and environmental justice or sustainability paradigms.

Alternative development focuses attention on inclusive democracy and public participation, ecological sustainability, appropriate technology, gender equality, intergenerational equity, and utilizing and supporting indigenous efforts to secure sustainable livelihood. Empowerment is at the core of the alternative development paradigm whilst commitment to environmental justice confronts human values and practices that degrade the environment and focuses attention on environmental sustainability. In this sense, the new and emerging development paradigms provide a gleam of hope. They could guide environment and development planners to recognize and utilize relevant aspects of indigenous knowledge, belief systems, norms, and practices in environmental impact assessment and planning processes.

1.2 Defining Indigenous Institutions

In defining indigenous institutions, it is probably appropriate first, to outline the characteristics of indigenous people. According to Durning (1993), indigenous people (or "native" or "tribal" people) are found on every continent and in most countries. The extreme variations in their ways of life and current circumstances defy a common definition although they are often identified by

the following common characteristics:

- they are descendants of the original inhabitants of an area taken over by more powerful outsiders;
- have distinct but often subordinate language, culture, or religion;
- have custodial concept of land and other resources, in part defining themselves in relation to the habitat from which they draw their livelihood; they often live in rural areas and maintain strong ties to a subsistence economy (Sen, 1992);
- have social relations that are often tribal, involving collective management of natural resources, networks of bonds between individuals, and group decision making; and,
- have relations that are often spiritual, routine, and historical and are regulated by native or indigenous institutions.

Central to the understanding of any society are its institutions, which are the regularized, patterned, and relatively repetitive processes in a society. They prescribe relations and ensure that the reciprocal action of role players fit into one another (Assimeng, 1981). Indigenous institutions represent established local community systems of authority and other phenomena derived from the socio-cultural and historical processes of a given society. They originate from local culture, have firm roots in the past and are variously referred to as informal, local, pre-existing, or native institutions (Matowanyika, 1991).

Indigenous institutions are often found at local or community level and their operation reflect the knowledge and experiences of their people. They are easily distinguished from non-indigenous institutions (Table 1.1). The latter are established through forces external to a given community and have functional and structural arrangements that are fairly standard (Uphoff, 1986). Also, non-indigenous institutions operate at national and international levels and reflect

Table 1.1 Characteristics of indigenous and non-indigenous institutions

Characteristics	**Non-indigenous Institutions**	**Indigenous Institutions**
Origin	Established through forces external to local culture and origins	Established through endogenous forces consistent with local culture & origins
Nature of operation	Reflect development strategies of the West	Commonly live or maintain strong ties to a subsistence economy
Level of operation	Fairly standard at national & international levels	Operate at local or community level and often reflect knowledge & experience of a particular people

Source: Adapted from Uphoff, 1986.

a specific image of development followed by Western industrialized countries throughout recent centuries (Giarelli, 1996). In this study, indigenous institutions are used synonymously with national, regional, and local or community level institutions that have firm roots in local culture and history.

In Africa and other parts of the world, early contact with Europeans resulted in the domination of indigenous institutions by a foreign bureaucracy or non-indigenous institutions often staffed and run by nationals (Mair, 1967). Although after independence, the new national bureaucracies

sought to keep native or indigenous institutions out of politics, the traditional rights and dignities of these institutions were preserved (Anderson, 1971). Consequently, tribal or indigenous authorities and systems of control and influence still exist in most African countries and are the focus of the present study.

According to Apter (1968), three factors give rise to the nature and organisation of indigenous institutions. These are: (a) behavioral alternatives; (b) goal orientation; and (c) social norms. **Behavioral alternatives** refer to systems of authority and roles, particularly, as they are legitimized in indigenous social and political structures such as family, the hierarchy of chieftaincy, the village council, and other structures entailing direct exercise of authority. **Goal orientation** refers to expectations or philosophy of life by which individuals view their future and adjust their activities. An example is the basic philosophy of life in many indigenous societies, which is built on the perpetuation of life for all objects--both animate and inanimate. **Social norms** refer to the sanctioned aspects of social actions enshrined in indigenous cosmological patterns which are permeated by spirituality and reverence for ancestors. Culturally acceptable environmental ethics and practices in indigenous societies emanate from these principles.

1.3 Indigenous Knowledge

Indigenous knowledge is generally referred to as folk ecology, ethnoecology, rural people's knowledge, marginalized knowledge, and local oppressed knowledge (Deshler, 1996). It is a body of knowledge built up by a group of people through generations of living in close contact with nature. It entails a system of classifications of natural resources, a set of empirical observations

about the local environment, and a system of self-management that governs resource use. The quantity and quality of indigenous ecological knowledge varies among community members, depending upon gender, age, social status, intellectual capability, and occupation (Johnson, 1992). Indigenous ecological knowledge often takes the following forms (Bourque et. al., 1992, Agrawal, 1995):

- **Knowledge of Biotic Materials:** an intimate and detailed knowledge of the environment, including plants, animals, and natural phenomena;
- **Technical Knowledge:** development and use of appropriate technologies for primary resource utilization, uses of biotic materials, and humane environmental conservation practices; and,
- **Cultural Knowledge:** cultural practices and beliefs, a holistic worldview that parallels the scientific discipline of ecology.

Indigenous ecological knowledge has several distinguishing characteristics (Table 1.2). It is the concrete expression of worldviews which do not regard human society as something separate from environment; instead, it emphasizes the unity and symbiosis of man and nature. It is checked, validated, and revised daily and seasonally through the annual cycle of activities and differs from Western science in a number of ways (Howes, 1980). Western science has adopted a set of assumptions on which knowledge generation is based and by which it is tested for validity (Wolfe *et. al.*, 1992). These include:

- **Reductionism:** understanding of a whole and complex phenomenon can be achieved in terms of more elemental events;
- **Objectivism:** the observer must deliberately separate her or himself from that which being observed and learn about it through replicable probes; and,
- **Positivism:** what is measurable is scientifically real, and what is real is measurable.

Table 1.2 : Indigenous Knowledge and Western Science Compared

Characteristics	**Western Science**	**Indigenous Knowledge**
Intellectual Hegemony	Dominant	Subordinate
Mode of Data Creation	Reductionism Objectivism Positivism Academic	Holistic Subjective Experiential Oral Tradition
Explanation	Scientific Inquiry Natural Laws Hypothesis Laboratory experiments	Spiritualism Beliefs and values Inexplicables Isolated instances of "crude" experiments
Ecological Classifications	Transcend local, regional, and national boundaries; aims at universality	Specific geographical and culture context
Recognition of Source of New Knowledge	Copyrights Patent rights Authorship	Notion of recognition is generally absent

Source: Adapted from Wolfe *et. al.*, (1991)

By contrast, indigenous knowledge is holistic, subjective, and experiential in character. Also data gathered by Western science is often selective and based on scientific inquiry including tested hypothesis, whereas those generated by indigenous knowledge are more inclusive and based on spirituality including the inexplicable. On one hand, scientists strive to understand the processes of nature, express underlying causalities in theory, and harness theory to manipulate the environment. On the other hand, indigenous people generally share the worldview that a large part of their environment is controlled by supernatural powers. Ecological classifications that are

based on Western science transcend local, regional, and national boundaries whereas indigenous classifications are often site specific and are different in another culture.

Indigenous knowledge is often seen to exist in a local context, anchored to a particular setting and at a particular time (Agrawal, 1995). Western science has been divorced from an epistemic framework in the search for universal validity (Banuri and Apddel-Marglin, 1993). Until quite recently, Western science had attained a virtually undisputed intellectual hegemony, whereas indigenous knowledge had been pushed to the epistemic peripheries and its utility poorly recognized (Kloppenburg, 1992). Western scientific discovery often has authorship, a notion of recognition, or copyright attached to it. On the other hand, indigenous knowledge is localized, transmitted orally, and the notion of giving individual credit is often absent (Deshler, 1996). It provides the basis for local level decision-making.

Even though natural scientists have only begun to recognize the knowledge systems of traditional resource-dependent communities, anthropologists have commented on the rationality and validity of such knowledge systems for decades (Rappaport, 1968). The work of Gibbons (cited in Brokensha et. al., 1980) in Sudan for example, suggests that by relying on local informants and drawing on their experiential knowledge, it was possible to undertake a perfectly satisfactory soil survey and mapping in a few days whereas formal scientific approach took several months. Similarly, Richards (1985) who worked in West Africa concluded that experiential knowledge of local people about the grasshopper *(Zonocerus Variegatus)* in relation to feeding and breeding habitat equalled that of western-trained ecologists in sophistication and

detail. Also, Walker (1985) has observed that for centuries, before the advent of Western science and civilization on the continent of Africa, the Masai and other tribal herdsmen knew when rain would fall based on the behaviour of the *Safari* ant which moves to the wing phase of its reproductive cycle three weeks prior to rainfall. Almost three decades ago, Conklin (cited in Chambers, 1983:87), wrote of the Hanunoo swidden cultivators in the Philippines:

> more than 450 animal types and over 1600 plant types are distinguished. Partly as result of their intensified interest in plant domestication and detailed knowledge of minute differences in vegetative structures, hanunoo plant categories outnumber, by more than 400 types, the taxonomic species into which the same flora is grouped by scientists or botanists.

These experiential knowledge systems are not simply the result of accumulated passive observations. Often, they include years of analytical and experimental approaches to learning. For instance, Swift (cited in Chambers, 1983:91) revealed that pastoralists in Mali who noticed that, with time, drinking a lot of tea made people nervous and irritable wondered as to whether the tea or the sugar was the causal agent. To find out the causal agent, they poured water and sugar on a liver of freshly slaughtered animal and there was no visible reaction. However, a similar experiment with tea and sugar gave a visible reaction. They concluded rightly that tea was the causal agent.

Despite evidence pertaining to its validity, indigenous ecological knowledge is not sacrosanct--it has limitations. The limitations include the following:

- through the process of acculturation, indigenous norms are no longer being passed down to the younger generation (Osherenko, 1988);

- lack of systematic records and common measurements make indigenous ecological knowledge vulnerable. It is site specific and so cannot transfer experiences easily to other sites; and,

- language barriers exacerbate obstacles to understanding indigenous knowledge, particularly by outsiders. Understanding of natural causalities in indigenous ecological knowledge systems requires comprehension of the local language.

According to Kroma (1995), formal education in developing countries is contributing to the demise of indigenous knowledge by both commission and omission. Formal education admits children into a new world which lies outside the traditional or indigenous boundaries of their communities. The prolonged absence of school children from indigenous communities deprives them of indigenous experiential knowledge. Also, formal education tends to promote Western science and values at the expense of indigenous knowledge and values. It fails to put forward indigenous knowledge as worthwhile subject matter for the learning process and thereby creates attitudes in children that militate against the acquisition of indigenous knowledge. Notwithstanding these limitations, indigenous ecological knowledge seems to have survived the test of time in many indigenous communities. It is the foundation of productive initiatives of indigenous people. According to Matowanyika (1991), several indigenous systems have tenaciously survived within groups in Africa. As history unfolded to accommodate the vagaries of colonial expedition in Africa, the indigenous people managed to keep their own history and cultures alive in many subtle forms while also adopting several of the external ideas. It is possible that indigenous norms and practices are changing or evolving rather than dying. In any case, the indigenous system should not be judged for its worth according to a static image of the past.

In metaphoric sense, if the concept and theories of development and indigenous institutions constitute the foundation on which the structure of this thesis rests, then indigenous ecological knowledge is the cornerstone. The thesis seeks to explore the potential role of indigenous institutions in environmental impact assessment and planning--a task that largely depends on the ecological knowledge base and practices among members of local institutions. This knowledge base covers all aspects of life and has much to add to the repertoire of development options. This is not to romanticize indigenous ecological knowledge. This thesis favours a more balanced approach in trying to blend culturally appropriate and sustainable aspects of indigenous knowledge and practices with Western scientific knowledge in environmental impact assessment and planning.

1.4 Rationale for the Study

Since the 1972 United Nations Conference on Human Environment held at Stockholm, significant changes have taken place in the attitudes and perceptions of developing countries and foreign aid agencies to environmental issues and problems. The question is no longer hinged on the necessity to incorporate environmental considerations in development projects in developing countries. Rather, the real issue is how to incorporate environmental considerations in planning, management, and the implementation of development projects in these countries. This was the concern of the Expert Group Meeting on Environmental Impact Assessment in Developing Countries, held in Guangzhou, China between March 7-24, 1983 (Biswas, 1990). It was also the message that evolved when nearly 200 persons from 40 countries attended a four-day Workshop on Impact Assessment for International Development in Barbados, in June, 1987 (Pierce, 1990).

Many donor nations, institutions and non-governmental organizations have expressed the need for environmental assessment in developing countries. For instance, in March 1989, The World Bank promulgated an official policy on environment to be followed by all staff and borrowers involved in projects in developing countries. The government of Canada is in the process of drafting the Project Outside of Canada (POC) regulations that will define the essentials of assessment procedures to be followed in developing countries where Canada is a proponent or provides funds for a project (Appiah-Opoku, 1994).

As a result of these initiatives, an increasing number of developing countries have adopted environmental impact assessment procedures that have much in common with Western models despite contextual differences. Yet, Western development approaches, from modernization theory to basic human needs approaches that were adopted in developing countries proved unsatisfactory due to several reasons, including the following (Warren, 1991; Atte, 1992; Kakonge, 1995; Agrawal, 1995; Mwinyimbegu, 1996):

- failure to incorporate positive aspects of local knowledge and perceptions into working procedures;
- total dependence on foreign ideas, goals, technology, and supervision. These were generally inappropriate because of differences in physical, socio-economic, cultural, and political contexts between developing and developed countries; and
- expense, not only in terms of imported materials and technology but also the galaxy of outside experts in all fields needed to implement the approaches and their lack of commitment to the goals and aspirations of host nations.

Against this background, a practical alternative to mimicking Western approaches to environmental assessment and resource management in developing countries could evolve by

studying and improving indigenous approaches to environmental management. In the words of Brokensha (1986:5) "...it is essential first to examine what indigenous people know before telling them what to do". After all, development, as Goulet (1975:156) notes, "is not a cluster of benefits given to people in need but rather a process by which a populace acquires greater mastery over its own destiny". Many in the development community have come to accept the likelihood of frequent failures in their work if it does not incorporate indigenous needs, concepts, and resources (International Development Research Centre, 1993).

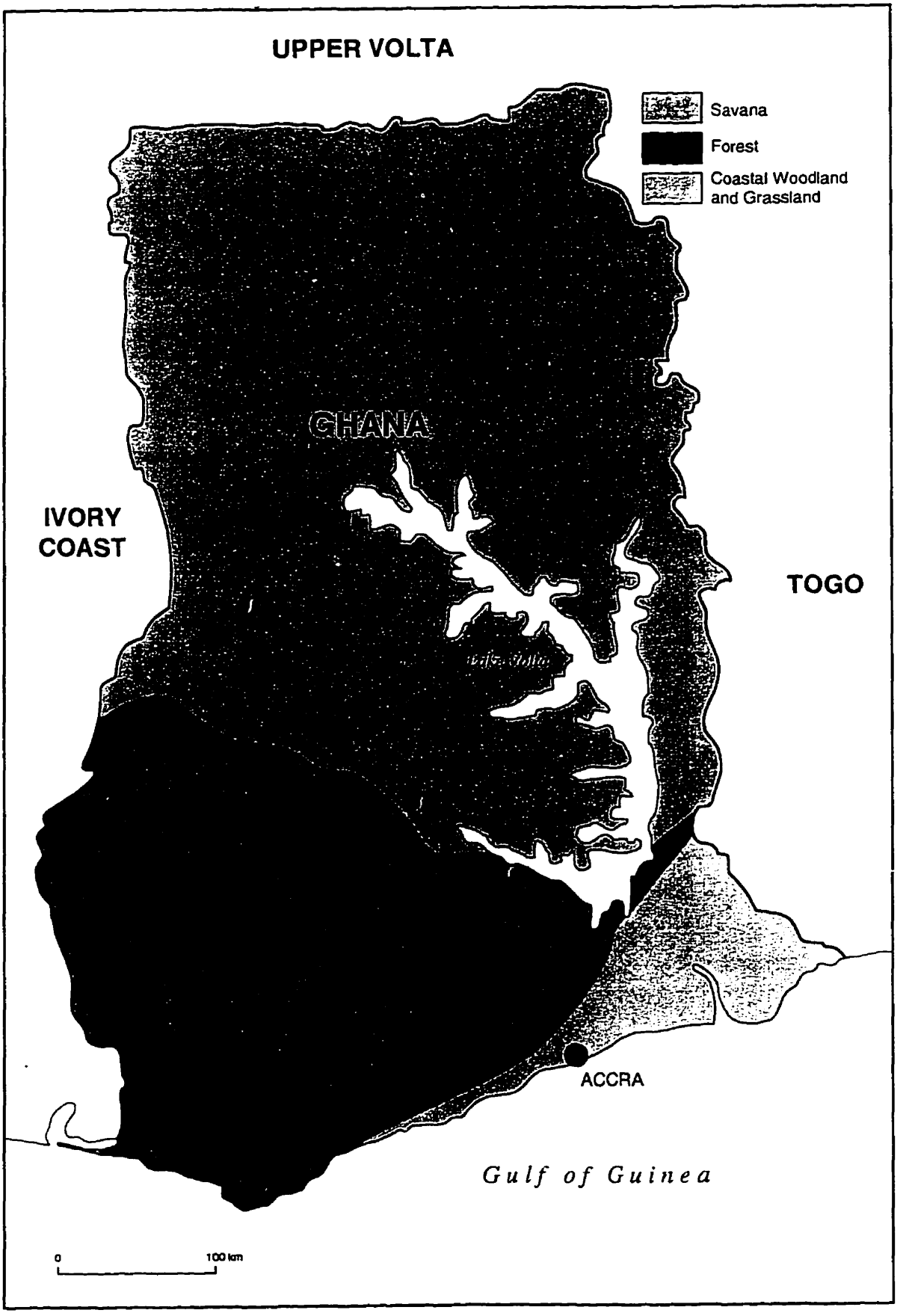
In the search for solutions to environmental problems, environmental planners and policy makers may have to explore indigenous institutions as a valuable source of social, cultural, and biophysical information and values. With detailed interactive knowledge of their environment, indigenous people often have insights regarding living in harmony with the Earth that the technocrat has lost (Klee, 1980). Also, the growing recognition of the limits of Western science in solving environmental problems of increased complexity and magnitude has resulted in calls for the incorporation of indigenous people and their ecological knowledge systems in resource management and development (Redclift, 1987). Kakonge (1995) argues that efforts to promote sustainable development within the framework of Agenda 21 in developing countries should be based on re-examining and applying indigenous knowledge and techniques, as opposed to a wholesale importation of Westernized methods and ideas. The goal is to attain the optimum combination of the best practices from indigenous knowledge and Western scientific knowledge. It is in this light that this thesis explores the potential contribution of indigenous institutions to environmental impact assessment and planning in Ghana.

1.5 Overview of Ghana--A Brief Geography, History, and Culture

Ghana is located on the Atlantic coast of West Africa and is bordered by Ivory Coast to the west, Togo to the east, and Burkina Faso to the north. It lies near the equator and covers 238,539 square kilometres. Its proximity to the equator results in high temperatures throughout the year. Annual mean temperature ranges from 26.1^0 to 28.9^0 Celsius. Closed forests are confined primarily to the southwest, savanna vegetation to the north, and coastal woodland and grassland to the south east (Figure 1.1). The closed forests shelter over 2,100 plant species and numerous endangered species. Much of the country's original vegetation has been considerably modified, degraded, or removed through human interference (Dorm-Adzobu *et. al.*, 1991). Considerable minerals exist in the form of gold, diamonds, manganese, and bauxite. The country ranks second to South Africa in annual output of gold in the World. Petroleum deposits have been discovered in large quantities offshore. Export earnings come mainly from agriculture, forestry and mining activities. Thus, the country's potential as a strong economy and environmental integrity lies in sustainable exploitation of available land resources (Environmental Protection Council, Ghana, 1991).

Until independence from British rule in 1957, Ghana was known as Gold Coast. The name was given to this part of the coast of Guinea in West Africa by European pioneers of trade and adventure of the fifteenth and sixteenth century who found gold to be in common use among the native people. The first recorded English trading voyage to the country was made in 1553 and in the course of the next three centuries the English, Danes, Dutch, Germans, and Portuguese all controlled various parts of the coast at different periods. A bond between the British government

Figure 1.1: Ghana--Vegetation Zones

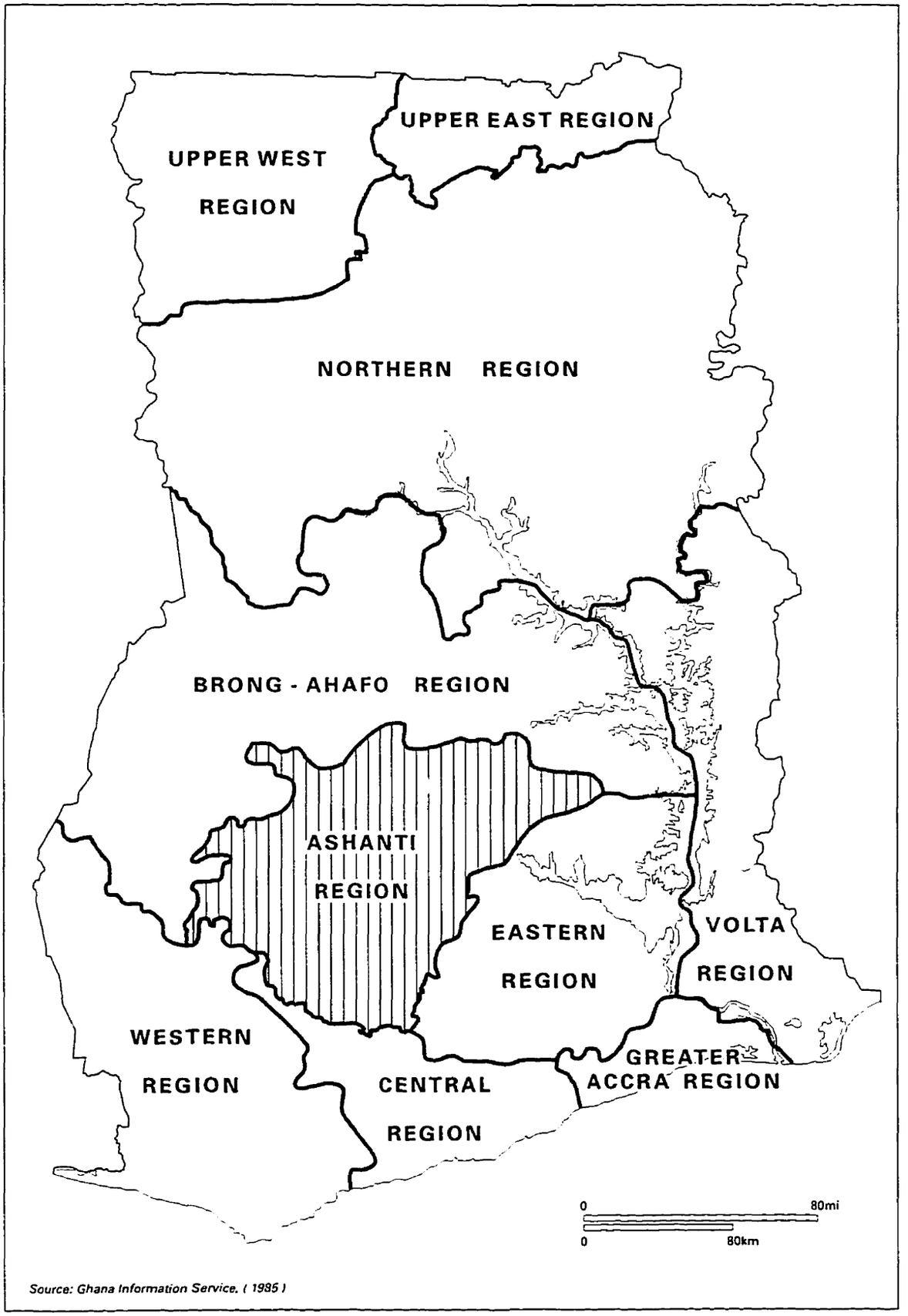


and some traditional chiefs in 1844, gave the British power and jurisdiction along the coastal area of the country. Not until the nineteenth century was the interior, occupied mostly by the Ashantis, reached by Europeans. Britain assumed full responsibility for the government of the then Gold Coast and its hinterlands in 1901 (British Information Services, 1956).

The foundations for a new nation were laid by the patient efforts of European traders, missionaries, indigenous people, local elites and government officials. A modern system of administration gradually extended into the hinterland from small coastal trading settlements. The construction of railways and roads provided the arteries for an expanding economy which, as time went on, sustained relatively higher living standards and an increased network of social services (British Information Services, 1956). On these foundations, modern institutions of local and central government were gradually constructed, incorporating much that was valuable in indigenous practices (Ayittey, 1991). Traditional chiefs were elected as ex-officio members to the colonial legislative assemblies, had authority to levy taxes, and were responsible for the implementation of government programs at the local level. British rule was marked by the progressive development of governing institutions.

Today, chieftaincy as an institution is enshrined in the country's constitution and chiefs continue to play a key role in the implementation of government programs at the local level. The chiefs also have a forum at the regional and national levels where they meet occasionally to discuss matters of regional and national interests. Thus, much of the old is still present in the modern new administrative set up. Today, there are ten (10) administrative regions in Ghana

Figure: 1.2: Ghana - Administrative Regions



Source: Ghana Information Service. (1995)

(Figure 1.2). Ghana is now under a democratic rule with a Fourth Republican constitution modelled as a hybrid of United States and British constitutions. British influence continues to be felt in every aspect of the Ghanaian society but most strongly in language, education, and formal institutions. For instance, the Town and Country Planning, Environmental Protection Agency, and Lands Department are modelled along those of the British system.

Culturally, the people of Ghana belong to two major linguistic groups. These are the *Gur* and the *Kwa* groups of languages found to the north and south of the Volta River respectively. The dominant linguistic group is the *Kwa* to which most of the languages of the peoples of Ghana belong. It is further divided into the *Akan* (45%) sub-group living principally on the west coast, in the forest zone and on the plains of the Volta; the *Ga-Adagbe* (9%) on the east coast, and the *Ewe* (13%) in the mid and south-east. Among the Akans, the most dominant ethnic group is the Ashanti. The Akan group has always lived in centralized states under the authority of chiefs and kings, whereas the other two groups did not traditionally live in states but only in small communities under clan or lineage heads. It was only later, during the reign and expansion of Ashanti empire in the eighteenth century, that nearly all ethnic groups in Ghana adopted the institution of chieftaincy from the Ashantis (Boahen, 1975).

1.6 Study Area--Ashanti Region, Some Background Information

Anthropologists generally interest themselves in a relatively small group of people or sample that they wish to study and get to know very well (Lystad, 1968). Due to the constraints of time and resources, the field research for this thesis adopted a similar approach and focused on

Ashanti Region of Ghana. Another reason is that the culture and lifestyles of the Ashantis are typical of Akans (the largest ethnic group) in Ghana (Figure 1.3) . The choice of Ashanti region was also based on the following considerations:

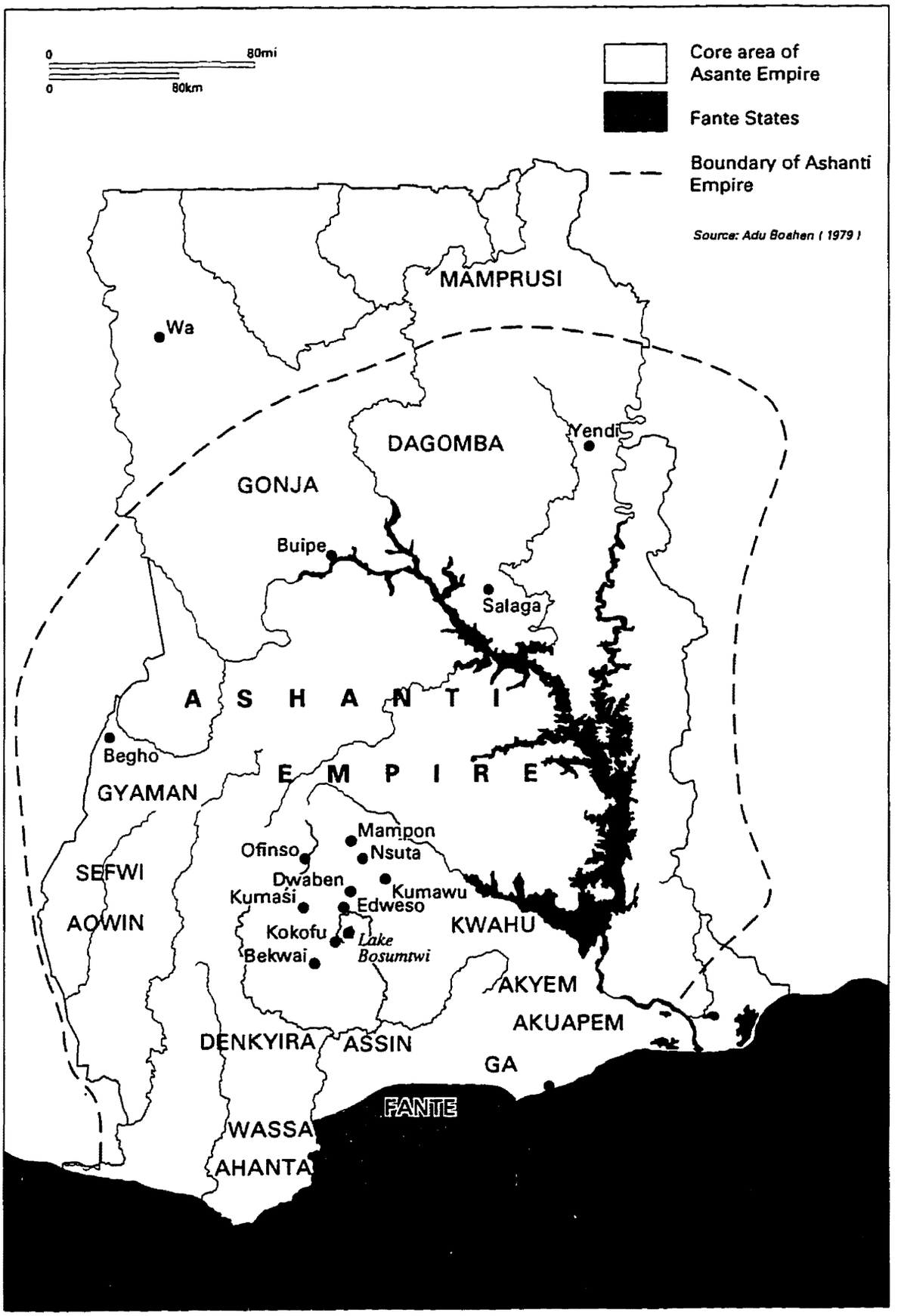
- Historically the Region influenced the culture in other parts of the country as an empire;
- The Region is a late comer to colonial rule (1901) and therefore managed to retain most of its culture;
- Availability of historic and current records on indigenous knowledge and institutions;
- Presence of major environment and development problems; and,
- The researcher's familiarity with the local dialect.

(a) Biophysical Characteristics

Ashanti region experiences wet semi-equatorial climatic conditions with warm temperatures throughout the year. Over the whole country, mean monthly temperatures never fall below 25^0 Celsius. This is explained by the fact that the country is close to the Equator. The hottest months of the year are March and April, just before the rainy season. August is the coolest month. The annual range of temperature for the region is 7^0 to 9^0 Celsius.

The region experiences two rainy seasons with mean annual rainfall between 125cm and 200cm. The first rainy season is from May to June, with the heaviest rainfall in June, and the second is from September to October. The rainfall pattern is erratic with a dry season between December and February (Dickson and Benneh, 1977). Four major climatic conditions are identified in a year. These are: (a) the main dry season--January to March; (b) main rainy season--April to June; (c) pre-harvest or minor rainy season--July to September, and (d) main harvest season--October to December. The annual rainfall is sufficiently high to allow for leaching and

Figure: 1.3 Map of Ghana: Ashanti Empire and Influence by 1901



loss of soil nutrients. Plants thus attempt to preserve nutrients in leaf growth and evergreen species make up about half the total species in this region (Amanor, 1994).

The region lies in a moist semi-deciduous forest zone. In its original form, the forest consists of three layers or strata of trees. The middle and lower layers have continuous canopies in a manner which makes it difficult to distinguish one from the other. The upper tree layer consists of scattered trees, between 35m and 45m high whilst trees of the middle layer are between 15m and 35m high. The trees in the upper and middle layers exhibit deciduous characteristics during the long dry season (November to March). The trees do not all shed their leaves at the same time nor are the trees of the same species leafless together. For this reason, it seems more appropriate to call it semi-deciduous. The lower layer consists of numerous varieties of trees and are between 10m and 15m high. Immediately below this layer is the undergrowth with ground vegetation which consists of low young trees, seedlings and herbs (Dickson and Benneh, 1977). Due to rapid expansion of cocoa industry in this region and the effects of bushfire and other human activities, very little of the original forest remains. Most of what is left is secondary forest. Apart from the big trees which farmers usually leave standing on their farms, the secondary vegetation consists of climbers, shrubs and soft wood plants.

In order to protect watersheds, streams, rivers, and endangered flora and fauna in this fragile ecosystem, about 57 forest reserves have been established since 1925 in the Ashanti region (EPA, 1995). Wildlife such as the porcupine, the giant hog, leopard, buffalo, elephant, and fox are among the 720 species that have been recorded in the region. In the region, there are few

amphibians and fish species, of which no quantitative information is available (EPA, 1995).

The principal soils covering nearly the entire region are *oxysols* and forest *ochrosols*[2]. The forest oxysols are predominant, and have developed from highly weathered parent materials under reduced amount of rainfall (Ahn, 1970; Dei, 1992). Unlike forest oxysols which are highly leached, yellowish, very acidic, and nutrient poor, the forest ochrosols are less leached, reddish, slightly acidic to neutral, and better supplied with nutrients. These soils are generally light and sandy, and thus easily cultivated (Dei, 1992). As will be noted in Section 4.4.1, indigenous farming systems in the region are well adapted to these biophysical conditions.

Wood is the region's principal source of fuel and it is used either directly or indirectly in the form of charcoal. Only three of the 57 forest reserves in the region, covering a total area of 2,410 square kilometres, are rated ecologically stable. These are the Onuem Bepo reserve, Dampia range, and Supuma Shelter belt all in Bekwai area. Areas where forest degradation has reached alarming proportion are within Ejisu-Juaben and Sekyere East districts (EPA, 1995).

Land degradation and soil erosion are rampant in several areas and this is attributed to surface mining, sand and stone quarrying activities, bush fires, and overgrazing (EPA, 1995). The region also experiences water and air pollution problems. These result from a combination of such factors as population pressure, inadequate toilet facilities, and lack of proper waste disposal

---

[2]*Ochrosol* means 'highly coloured soils'-- *ochro* is derived from a Greek word meaning well coloured.

facilities for industrial and domestic waste treatment. In urban centres such as Kumasi, Mampong, Kumawu, and Obuasi, untreated domestic and industrial waste are dumped in such rivers as Subin, Oda, Kwabrafo and Pompora Rivers which serve as sources of drinking water for sections of the population. The problem of water pollution is compounded by frequent use of chemicals for inland fishing. Air pollution in the region is quite localised in mining and industrial areas such as Kumasi, Obuasi, and Asonomaso. The pollutants include dust, carbon monoxide, sulphur dioxide, and arsenic oxides. For instance, in Obuasi, as a result of the roasting operation in a gold mine, huge volumes of toxic arsenous oxide and sulphur oxides smoke pours incessantly out of the 186 foot mine chimney rendering the surrounding countryside barren. A recent experiment revealed a high proportion of arsenic concentration in human hair in Obuasi (EPA, 1995).

(b) Economic Characteristics

Agriculture is the dominant primary economic activity in the region employing over 77% of the region's population and about 90% of the rural population. Farming is mostly on a small scale depending largely on slash-and-burn using simple implements such as the hoe, axe, and cutlass. There are only a few large-scale commercial farming activities mostly concentrated in the northern sector of the region (Dickson and Benneh, 1977). Livestock, cash and food crops production are the major agricultural activities in the region. The traditional cash crops include cocoa, coffee, cola, avocado, pea and citrus fruits. Other crops grown are ginger, bast fibre and sugar-cane. The food crops cultivated are maize, cassava, rice, yam, cocoyam and plantain. Cattle, sheep, goats, pigs, and poultry are raised on a limited scale (EPA, 1995).

There are over 4,000 manufacturing industries in Ghana (EPC, 1990). Half of these industries are classified as either medium or large scale. Ashanti Region has almost 25% of the total industries in Ghana. Large-scale industries in the region are mostly concentrated in urban centres and include mining, furniture, sawmills, and agro-industries. Traditional industries are scattered throughout the region and include the following: wood carving; pottery and ceramics; kente weaving and dyeing; and palm oil making.

(c) Social Characteristics

With a total population of 2,090,100, Ashanti region accounts for 17% of the entire population of the country with a population density of 86 persons per square kilometre compared to the average national population density of 51 persons per square kilometre. The region's population is predominantly rural; nearly 80% of the population lives in small towns, villages, and hamlets (EPA, 1995).

The region has twenty-one traditional councils with a very rich cultural heritage. The King of Ashanti (Asantehene) is the traditional head of the Ashanti Kingdom. The administrative headquarters of the kingdom is Kumasi. The King rules the region through paramount chiefs and subchiefs. He occupies a Golden Stool which, according to history, contains the souls of all Ashantis. The stool unites the Ashantis and it is believed to have acted as the basis for Ashanti empire until British colonial rule of the region began in 1901 (EPA, 1995).

1.7 Outline of the Thesis

The thesis is divided into six Chapters. Chapter 1 provides a conceptual background of issues that are examined and expanded upon in the rest of the thesis. These include the concept and theories of development, indigenous institutions and their knowledge systems, and the rationale for the study and choice of study area. Chapter 2 is divided into two sections. The first section reviews the concept of environmental assessment and its logical links with land use planning. As well, the section discusses planning theories underlying environmental impact assessment and the need to incorporate relevant aspects of indigenous knowledge and practices in assessment and planning. The second section reviews the evolution, procedure and constraints to environmental impact assessment in Ghana.

Chapter 3 provides an explanation of the approach used to investigate the research objectives. It discusses the research design, field research, and analysis and presentation of data. The research methods used at each stage of the research process are also discussed. Limitations of the methods are outlined and discussed at the end of the chapter. Chapter 4 presents three sets of research findings. These are the result of interviews conducted with: (a) village elders; (b) indigenous healers, hunters and farmers; and (c) government officials, academicians, environmentalists, and nongovernmental organizations respectively. Based on the research findings, Chapter 5 discusses aspects of indigenous institutions that are relevant to assessment and planning in Ghana. Chapter 6 provides a summary of key findings that address the research objectives. It also provides conclusions from the study and directions for future research.

Chapter Two

THEORETICAL ORIENTATIONS OF ENVIRONMENTAL (IMPACT) ASSESSMENT: IMPLICATIONS FOR DEVELOPING COUNTRIES

2.0 Introduction

This chapter is divided into two sections. The first section reviews the concept of environmental impact assessment and its logical links with land use planning. As well, the section discusses planning theories underlying environmental impact assessment and the need to incorporate relevant aspects of indigenous knowledge in assessment and planning processes. The second section reviews the evolution, procedure and constraints to environmental impact assessment in Ghana. The discussion explores openings for the integration of indigenous knowledge system in environmental impact assessment and planning processes. The chapter is largely based on reviewed literature.

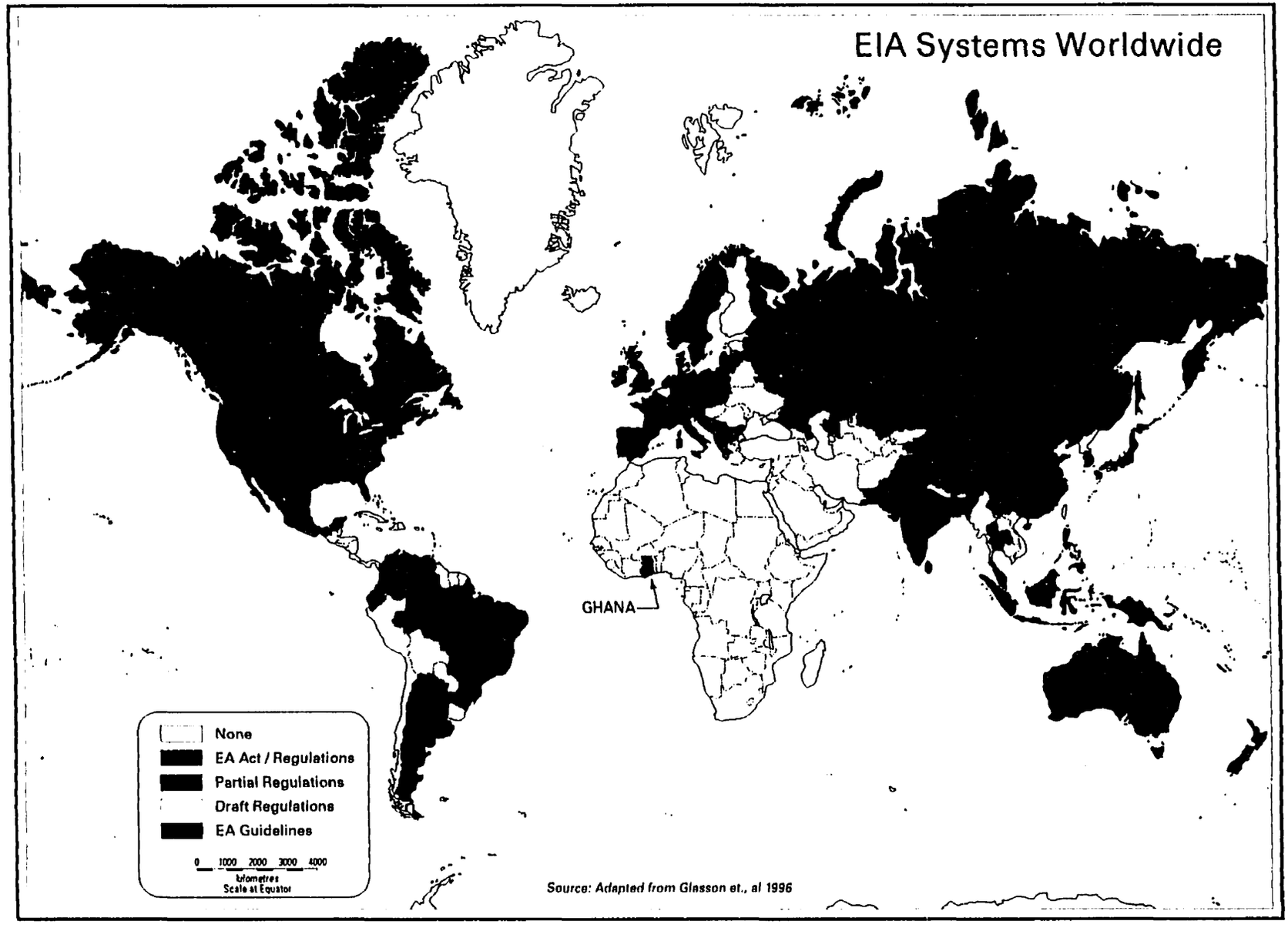
2.1 The Concept of Environmental (Impact) Assessment

All ecosystems have a threshold of tolerance for pollution and disturbance beyond which the system may suffer anything from temporary upsets in quality to complete destruction which often results in public outcry (Fortlage, 1990). Such outcries in the United States resulted in the enactment of an environmental legislation by Congress in 1969. The United States became the first country to establish environmental impact assessment process in 1970 when President Richard M. Nixon signed into law the *National Environmental Policy Act* of 1969 (Couch, 1993). In subsequent years, environmental impact assessment processes in various forms have been introduced in many other countries and jurisdictions, and have been accepted by the World Bank

and other bilateral agencies, and inter-governmental bodies (Tolba *et al.*, 1992). These range from mandatory regulations, acts or statutes which are generally enforced by requiring the preparation of Environmental Impact Statement (EIS), to *guidelines* which are not enforceable but generally impose obligations on proponents (Figure 2.1). Other legislation allows government officials to require EIS to be prepared at their discretion. Elsewhere EIS are prepared in an *ad hoc* manner, often because they are required by donor agencies such as The World Bank, USAID, or CIDA.

There is no generally agreed or universal definition of environmental assessment. The vocabulary and definition of environmental assessment is still in a state of development and consolidation. Its practitioners tend to give their own meanings to words and phrases (Fortlage, 1990). For instance, Environmental Assessment is often used synonymously with Environmental Impact Assessment (Beanlands and Duinker, 1983), though the two differ in scope and potential effectiveness. Environmental Impact Assessment (EIA) focuses on the prediction and assessment of environmental impacts, and the mitigation of those impacts, **usually on a project-specific basis** whereas Environmental Assessment (EA) attempts to understand interacting elements and processes of the environment including human activities for decision-making purposes and is **undertaken at various stages of management, planning, and policy-making** (Gardner, 1989). Fortlage (1990) argues that there is no absolute definition of environmental assessment as a single concept. It is a compound term embodying ideas and techniques which have developed over the years as a result of increasing concern with the dire consequences of human interference with the environment, and has been variously defined as follows:

Figure 2.1 EIA Systems Worldwide



- a process or a set of activities designed to contribute pertinent environmental information to project or program decision-making. In doing so, it attempts to predict or measure the environmental effects of specific human activities or do both, and to investigate and propose means of mitigating those effects (Beanlands and Duinker, 1983).

- an activity designed to identify and predict the impact on the bio-geophysical environment and on human health and well-being of legislative proposals, policies, programs, projects and operational procedures, and to interpret and communicate information about the impacts (Munn, 1985).

- a vehicle for incorporating environmental considerations along with conventional technical, financial, socio-economic, cultural and political considerations in decision-making (Gibson, 1993).

In view of the variety of definitions that environmental assessment enjoys, it is helpful to define its components. Theoretically, the term **"environment"** encompasses both the natural and human components of the environment and their inter-relationships (Canadian Environment Assessment Research Council, 1988). The term **"impact"** is considered synonymous with effects and their significance (Fortlage, 1990). This is critically discussed by experts. During and after development, **impact** is calculated ideally as the difference between the measured condition of the variable of interest with development, and the expected condition without development (Duinker, 1989). Several types of impacts are identified by Glasson et. al., (1994). These include: (a) direct and indirect impacts; (b) cumulative impacts; (c) adverse and beneficial impacts; (d) actual and perceived impacts; and (e) reversible and irreversible impacts. According to Lawrence (1994), the **"assessment"** component of EA involves the following:

- **Analysis** -- data collection and compilation, the identification of effects and interactions among effects, and description, measurement and prediction of effects and interactions among effects (Armour, 1990).

- **Synthesis** -- the interpretation of the significance of effects and interactions among effects, and the aggregation and evaluation of individual and cumulative effects, both with and without mitigation (Westman, 1985; Armour 1990).

- **Management** -- mitigation, compensation and local benefits, the management of predicted impacts, monitoring and contingency measures, communications, and consultation activities (Armour, 1990).

Thus, environmental assessment is essentially a comprehensive approach to decision-making in which analysis, synthesis, and management of predicted impacts of development policies or programs and projects play major roles. The overall purpose is to prevent biophysical and socio-economic damage through enlightened decision-making and ecological rehabilitation. According to Gibson (1993), an ideal environmental assessment process involves the following:

- Identification of the purpose of undertaking. This involves examination or clarification of the need or opportunity to be served and the determination of initial scope of inquiry;

- Identification of reasonable alternatives to the undertaking. This involves delineation of possible means of meeting a defined need or opportunity, and the elimination of options that are not feasible;

- Assessment of alternatives to the undertaking. This involves identification and study of existing environment that may be affected, prediction of potential effects, identification of reasonable mitigation options, and the evaluation of potential non-mitigable effects and risks in areas of uncertainty;

- Selection and elaboration of preferred alternatives. This involves comparison of alternatives and identification of preferred alternative(s), as well as detailed planning and mitigation measures;

- Documentation and submission of assessment and proposal. This involves preparation of the assessment document and submission to approval agency, and public notice;

- Review of assessment and proposal. At this stage, the assessment document is reviewed by government agencies and interested public. This may involve public hearings and other dispute resolution procedures. Conclusions are drawn by a review panel or agency;

- Decision of approval, rejection, or approval with terms and conditions, or subsequent specific approval where required; and,
- Implementation and monitoring. This stage involves implementation including mitigation, monitoring of actual effects and compliance with commitments and conditions of approval, correction, and re-evaluation.

Thus, an ideal environmental assessment process is comprehensive, proactive, and participatory with obligatory examination of alternatives. It guides, encourages, and forces environmental responsibility into all stages of the conception, planning and approval of environmentally significant undertakings. It encourages public involvement and pays careful attention to matters of public concern. This is desirable to combat possible narrow biases of proponents. A broad public involvement is also desirable because environmental assessment is a useful learning process for everyone. However, due to the confusion associated with the term "environmental assessment" this thesis uses the term synonymously with "environmental impact assessment and planning" and "assessment." These terms incorporate broader planning issues.

2.2 Planning Theories Underpinning Environmental Impact Assessment Practice

Although there is no clear evidence that environmental impact assessment in the USA or elsewhere emerged out of land use planning practice, procedurally and technically, the two seem to have a great deal in common (Armour, 1990; Lawrence, 1992). Both land use planning and environmental impact assessment evolved quite separately but in similar directions and with a common purpose.

The approach to land use planning in many jurisdictions, including Ghana, centres on two major activities: (a) the preparation of official or master plans for areas under local or regional government jurisdiction; and (b) development approvals for specific land uses based on socio-cultural, economic, political, and biophysical considerations. Thus, both land use planning and environmental impact assessment are anticipatory in the sense that they precede decision-making and share the goal of broadening and improving decision-making beyond the narrow technical and economic agenda of considerations. In the initial stages of their development, both disciplines emphasized biophysical and spatial considerations. Over time, the orientation of both fields has broadened to encompass a range of social, cultural, economic, institutional and political concerns. Again, both land use planning and environmental impact assessment have struggled with many of the same issues including, for example, the role of the public and the potential for reconciling conflicting values (Lawrence, 1992; Appiah-Opoku, 1994). It is therefore not surprising that theories that underpin land use planning also provide reasonable basis for examining environmental impact assessment practice (Appiah-Opoku, 1994).

Faludi (1973) classifies planning theories into two major categories: *Substantive* and *Procedural*. Substantive planning theories deal with the subject matter (what) of planning and the subjects (for whom) of planning. In contrast, procedural planning theories are concerned with the planning process and organizational forms of planning (Alexander, 1986). Hudson (1979) and Friedmann (1987) identify five major procedural planning theories that could provide the basis for examining environmental decision-making. These are: Synoptic/Rational Comprehensive, Incremental, Transactive, Advocacy, and Social Learning.

2.2.1 Synoptic/Rational Comprehensive

The Synoptic or Rational Comprehensive is the dominant theory in planning practice and the point of departure for most planning approaches (Hudson, 1979). Despite many years of criticisms, it continues to be unyieldingly present in the practice of environmental planning (Lawrence, 1992). Briassoulis (1989), identifies the following process as the thrust of this theory: objective and exhaustive analysis of the environmental and socio-economic conditions along the lines of a systems analytic framework; identification and formulation of alternative solutions to environmental problems; and selection of the best solution that meets objective scientific criteria. The process is similar to most environmental impact assessment which also involves identification of the purpose of the undertaking, alternatives to the undertaking, selection and elaboration of preferred alternative, and implementation and monitoring.

In its quest to be more scientific, Synoptic/Rational Comprehensive theory relies heavily on quantitative techniques such as cost-benefit analysis, pre-project experiments, statistical analysis, and trend extrapolations (Field and MacGregor, 1987). Thus, the theory confers an aura of scientific precision that encourages planners and administrators to search for quantitative solutions to environmental problems and to rely on technical standards rather than to seek knowledge and insights from those who are supposed to benefit from development policies, programs and projects.

The Synoptic/Rational Comprehensive theory is extremely effective at maintaining the existing power under a mask of rationality, efficiency and science (Goodman, 1972). However, this theory

is criticized on the grounds that it treats environmental planning and management as a "technical, value-free, apolitical activity" with little or no consideration of the local socio-economic and political climate (Beazley, 1989).

Among other things, application of Synoptic/Rational Comprehensive theory thrives on such pre-conditions as the presence of rigorous scientific capabilities, organized scientific data, instruments for data analysis and integration, and efficient institutions. To a great extent, these pre-conditions are lacking in most developing countries, especially in Africa.

2.2.2 Incremental

In his article, "The Science of Muddling Through", Lindblom (1979) stressed that policy decisions are better understood, and better arrived at, in terms of the push and tug of established institutions that are adept at getting things done through decentralized bargaining processes best suited to a free and democratic political economy (Hudson, 1979). This is the thrust of Incremental theory. Justifying this theory in environmental planning practice, Lindblom (1979) argued:

> we did fall into our environmental problems through piecemeal gradualism. That still leaves open the possibility that the same route is the only route out of the problem... And because everything is interconnected, it is beyond our capacity to manipulate variables comprehensively...The whole environmental problem is beyond our capacity to control in one unified policy. Therefore, we need to find critical points of interventions.

This is manifested in cases where environmental problems are given attention only when they have reached crisis proportions. An example in Canada is the Oldman River Dam in Alberta for

which the application of environmental assessment was considered after about 70 percent of construction work had been completed. The decision to apply environmental impact assessment to the dam was the result of Canada's federal court ruling that "fisheries, Indians and Indian lands could be affected by the dam and its reservoir" (Toronto Star, 1990:A19; Appiah-Opoku, 1990). However, there was an earlier environmental review by the Alberta Environmental Council, a semi-independent government body, which recommended against the project but this was ignored.

On the basis of Incremental theory, environmental crises are handled individually and isolated from their broader contexts within the range of available possible means. Consequently, environmental impact assessment studies are unable to address adequately issues of cumulative impacts (Briassoulis, 1989; Appiah-Opoku, 1994). Thus, clearly, the Incremental theory does not meet environmental soundness criterion because of its limited vision of unbounded environmental problems (Edmund, 1981). This theory thrives on efficient institutions, data integration systems, and coordination mechanisms and general consensus on the development issues. These conditions are lacking in most developing countries.

2.2.3 Advocacy

Advocacy theory is rooted in adversarial procedures modelled upon the legal profession. The theory evolved in response to public policies that combined a superficial pluralism with the effective exclusion of the poor and minorities, and also in response to professional planning culture that was monolithic in its devotion to land use and a not-easily-accessible public interest

(Clavel, 1994).

The apparent bias of proponents in favour of their own interests and proposals means that an effective environmental impact assessment process, especially the review component, must have a somewhat adversarial character (Gibson, 1990). The "not-in-my-backyard" syndrome associated with the siting of locally unwanted land uses (LULUs) and a number of court cases resulting from the siting of landfills and environment impact assessment studies are manifestations of the advocacy approach. Some well-known Canadian examples are the Ontario Regional Municipality of Halton's landfill site, and the Oldman River Dam in Alberta which sparked a series of court actions. They reflect public concerns about the present and future quality of life, including both the biophysical and socio-economic components of the environment (Gibson, 1993). Advocacy theory is usually applied to defending the interest of the marginalized and the disenfranchised against the established powers of business and government (Alinsky, 1971; Heskin, 1977; Hudson, 1979).

In working through the courts, advocates have injected a stronger dose of explicit normative principles into environmental impact assessment studies and have fostered greater sensitivity to unintended impacts of projects. The increasing requirement of assessment studies for large-scale projects in most parts of the world is, to a very large extent, the result of advocacy. However, Goodman (1972) criticizes it as a token that creates the impression of allowing the poor to be in control of their own development affairs, while keeping the political and economic structures which oppress them intact.

Advocacy theory is best applied under conditions of participatory democratic institutions, a high degree of tolerance, a legal aid system or intervenor funding, and a truly independent judiciary. These conditions are not apparent in most developing countries, especially those with dictators. For instance, on November 10, 1995, the Nigerian government hanged environmental activist Ken Saro Wiwa despite protests from the Commonwealth and other peace-loving nations. Ken Wiwa's "crime" was a protest with members of his Ogoni tribe of Nigeria against environmental havoc being caused by Shell--a multinational petroleum company (Wiwa, 1996). In Kenya, a District Commissioner's permit is required for a meeting of more than five (5) people who are not related (Wanjiku, 1996).

2.2.4 Transactive

A fundamental premise of Transactive theory is that the process of societal guidance is too important to be left entirely to experts (Kolo, 1986). It focuses on the experience of people's lives to reveal policy issues to be addressed (Friedmann, 1973).

On the basis of this theory, environmental impact assessment is not carried out with respect to anonymous target communities, but in face-to-face contact with people affected by the assessment decisions. It focuses **less** on field surveys and data analyses, and **more** on experiential learning and interpersonal dialogue marked by a process of mutual learning (Hudson, 1979; Afrane, 1991; Appiah-Opoku, 1994). An example in Canada is the Berger Inquiry on the Mackenzie Valley Pipeline proposal which conducted hearings in affected native communities. The hearings offered native people the opportunity to tell the Inquiry, in their own language and

style, what their lives and experience led them to believe the impact of a pipeline and an energy corridor would be. According to Berger (1984), the hearings revealed that native people who lived in the affected areas had a great deal that was worthwhile to consider and that the judgement of planners and policy-makers might not always be right.

Transactive theory also promotes the evolution of decentralized planning institutions that help people take increasing control over social processes governing their welfare. Environmental impact assessment studies are evaluated not only in terms of what they do for target communities through delivery of goods and services, but also in terms of the adverse impacts on people's dignity, norms and values, and their capacity for growth (Appiah-Opoku, 1994). This takes the form of biophysical and socio-economic risk assessments. To a great extent, Transactive theory is seen in the decision-making process of indigenous institutions in most developing countries, especially in Africa and could form the basis for environmental assessment (Appiah-Opoku, 1994).

2.2.5 Social Learning

Social Learning theory provides some useful information on the ideal intent of participatory planning and public involvement in environmental decision-making. It focuses on building the capacities of citizens and institutions for autonomous decision making (Argyris and Schon, 1975; Korten and Klauss, 1984; Friedmann, 1987). The central theme of this theory is that the capacity of stakeholders for active and sustained participation in environmental impact assessment processes depends largely on their ability to learn about, cope with, and adjust themselves to new

experiences and challenges (Kolo, 1987). This entails a form of tacit and informal learning involving **cognitive enhancement** and **moral development** (Friedmann, 1987; Webler *et al.*, 1995). Cognitive enhancement enjoins planners and environmental experts to learn about the following:

- The state of a problem (information and knowledge);
- Possible solutions and the accompanying consequences (cause-effect relations, prediction);
- Interests and values of the target population (information, explanation);
- Methods, tools, and strategies to communicate well and reach agreement with the target Population; and
- Holistic or integrative thinking.

Moral development pertains to the ability of environmental planners and stakeholders to make informed judgements about right and wrong. In so doing, they are able and willing to set aside egoistic demands and act for the common good of society. In this sense, the Social Learning theory could guide environmental planners to:

- Develop a sense of self-respect and responsibility to oneself and others, regardless of how these may impact on one's own interest or values, and acting accordingly;
- Take on the perspectives of others;
- Learn to integrate new cognitive knowledge into the choice of preferred course of action or project; and,
- Learn to cooperate with others in solving collective problems (Webler *et al.*, 1995).

In addition, Social Learning theory requires environmental planners to develop a transactive relationship with stakeholders in a way that is conducive to **open dialogue and mutual learning** (Schein, 1969; Friedmann, 1987). The essence of open dialogue is to make stakeholders aware of the realities around them, and of the need to participate in the struggle to transform their world for the better. The theory encourages the principle of learning directly from indigenous people

by trying to understand their knowledge systems and incorporating them directly in decision-making. It has the potential to simultaneously guide planners to appreciate indigenous systems by expanding their knowledge base and empower indigenous people by transferring the initiative for action to them (Singh and Titi, 1995). It has been demonstrated that the exclusion of indigenous knowledge and experiences from development activities has had disastrous consequences in every regions of the world where outsider knowledge has been imposed without regard to local knowledge (Lansing and Kremer, 1995; Kroma, 1995; Cashman, 1989).

2.3 Applying Planning Theories to Environmental Impact Assessment in Developing Countries

The regions of the world that have not attained a high material standard of living -- most of Asia, Africa, and Latin America -- are often referred to as "underdeveloped", "emerging", "developing", or "Third World" countries (Anderson, 1971). Todaro (1985) distinguishes three major groups of countries within the Third World. These are the 42 poorest countries designated by the United Nations as "least developed", the 88 non-oil-exporting "developing nations", and the 13 petroleum-rich OPEC countries whose national incomes increased dramatically during the 1970's.

In spite of geographic, historic, cultural, and demographic differences, most developing countries share a common set of socio-economic and development dilemmas that define their state of underdevelopment. According to The World Bank (1992) and Todaro (1985), these include:

- Low income per capita and widespread absolute poverty;
- High and rising levels of unemployment and under-employment;

- Low and stagnant levels of agricultural productivity;
- Rapid urbanization and growing imbalances between urban and rural levels of living and economic opportunities;
- Low level of participation of women in development;
- Severe balance of payments and international debt problems;
- Substantial and increasing dependence on foreign and often inappropriate technologies, institutions and value systems; and
- Hostile political climate with a tendency toward authoritarian rule.

Thus, the socio-economic and political conditions in developing countries are more turbulent and unpredictable compared to the developed world. These conditions do not encourage effective application of the procedural planning theories discussed in Section 2.2. It is therefore not surprising that progress towards adopting environmental assessment as a management tool has been extremely slow (Ebisemiju, 1993; Appiah-Opoku, 1994). Table 2.1 shows that only 20 of the 121 sovereign developing countries are known to have laws at the national level requiring EA for certain kinds of projects and programs. Only 7 of the 20 with EIA systems have laid-down procedures for environmental impact assessment. The validity of Table 2.1 may be questioned because of changing circumstances of the application of environmental assessment in developing countries. Nevertheless, it dramatizes the slower pace of environmental impact assessment adoption in developing countries.

In stressing the importance of theory, Leonardo da Vinci warned that "those who practice before they have learned the theory resemble sailors who go to sea without a rudder" (McConnell, 1981; Appiah-Opoku, 1994). Developing countries do not seem to have appropriate planning theories to steer environmental impact assessment. Only 7 of the 20 with EIA systems have Acts and procedures for environmental impact assessment. These are: Ghana, The

Table 2.1: Status of EIA in Developing Countries

REGION	TOTAL NUMBER OF COUNTRIES	COUNTRIES WITH EIA SYSTEMS
Africa	52	1
Asia & Pacific	24	12
Caribbean	11	-
Latin America	20	7
Middle East	14	-
TOTAL	121	20

Source: Adapted from *Ebisemiju* (1993)

Philippines, Thailand, Malaysia, China, Mexico, and Brazil (Ebisemiju, 1993). Based on foregoing discussions, it seems that Transactive and Social Learning theories, and Alternative Development paradigms such as Empowerment and Environmental Sustainability and Justice could form the basis for environmental impact assessment and development planning in much of the developing world. This is especially true in Africa where the basic tenets of these theories are present in the decision-making processes of indigenous institutions (Appiah-Opoku, 1994).

2.3.0 The Case of Ghana: Environment and Development Policies

Ghana has experienced development planning without systematic analysis of potential environmental impacts since 1919 when the then colonial British government introduced a 5-year development plan for the country (Adarkwa, 1983; Ofori, 1991). This trend continued after the country's independence from the British with heavy reliance on *modernization* theory as the major development strategy. According to Amin (1973), this strategy focused attention on

agricultural mechanization, industrial diversification, and provision of urban infrastructure and public services.

The Ghana Industrial Development Corporation was established in the late 1950's and was charged with the task of establishing 600 factories within 10 years. In a rush to fulfil the dream of modernization, manufacturing industries were established at a break-neck speed and without proper assessment of their impacts on the local environment. Also, in the early 1960s the Volta River Project at Akosombo was started. The project was meant to exploit Ghana's huge bauxite reserves, provide irrigation possibilities and electricity for industrial expansion. Unfortunately, the construction of the Volta River Dam, described by Moxon (1984) as human's greatest lake, has provided excellent breeding ground for *trypanosomiasis,* which causes river blindness and almost half of the human population over 40 years of age living along the banks of the Volta lake have lost their eye sight. Between 1960 and 1964, the incidence of *bilharziasis*[3] rose from a mere 5% in riparian children to an outrageous 90% among children who live near the lake, and today virtually all the people inhabiting the entire shoreline are infected (Moxon 1984). Conceived as a modernization showpiece, the Volta River Dam has had adverse environmental impacts on the local people. The government conceded too much to corporate investors of the Volta Project, in terms of ruinous concessions on taxation and mitigation of project impacts (Amin, 1973).

[3]*Bilharziasis* is a urinary form of water-borne disease

During the same period, the Tema seaport and fishing harbour was constructed. The project involved a resettlement of 12,000 people living in old Tema and the transplanting of over 200 communal and family gods (Amarteifio *et. al.*, 1966). Implementation problems pertain to the failure of project officials to understand local resource use and nuances, and use local value sets to interpret project impacts. Most villagers who were resettled lost all that was culturally dear to them, including burial grounds and shrines. This led to a feeling of depression, inadequacy and insecurity especially, among the elderly.

Since 1983, Ghana has been pursuing Structural Adjustment Program (SAP) under the African Priority Program for economic recovery of the World Bank and International Monetary Fund (Rothchild, 1991). The SAP has necessitated very intensive infrastructural rehabilitation and resource exploitation, especially in the timber and mining sectors of the Ghanaian economy (Ofori, 1991). The potential environmental impacts of SAP has been recognized by the government and this has resulted in the enactment of environmental impact assessment Act in Ghana.

2.3.1 Evolution of Environmental Impact Assessment in Ghana

Ghana's attention was first focused on environmental issues at the 1972 Stockholm Conference on Human Environment (Environmental Protection Council, 1991). In 1973, Ghana created the Environmental Protection Council (EPC) which became the first governing body in Africa to focus on issues of environmental management. One of the functions of the EPC was to ensure the observance of proper safeguards in the planning and execution of development projects that

are likely to interfere with the quality of the environment (Allotey and Amoyaw-Osei, 1996). Following its establishment in 1973, the EPC recognized the need to formally introduce a systematic procedure for evaluating the environmental effects of development projects (Abrokwa-Ampadu and Ampadu-Agyei, 1987). In March 1981, a draft Investment Code was published to consolidate and reenact existing legislations relating to investments in Ghana with a view to attracting large-scale foreign investors into the country. The EPC seized the opportunity to impress on the law-makers that there was the need to include in the code, provisions that would ensure that the country's environment was not degraded by such investments (Osafo, 1983).

In 1985, Ghana's Investment Code was legalized under Provincial National Defence Council Law 116. The law regulates investment in four key sectors of the economy, namely, manufacturing, construction, agriculture, and tourism. It requires investors to show sufficient evidence that their proposed project(s) would not have any deleterious effects on the environment. The government set up the Ghana Investment Centre (GIC) as the agency for encouraging, promoting, and coordinating private investment in the Ghanaian economy. The GIC is required to appraise enterprises and note any effect an enterprise is likely to have on the environment and the measures proposed for the prevention and mitigation of any harmful effects (Environmental Protection Council, 1991).

Furthermore, the EPC set up a EIA committee in 1985 to examine ways in which a EIA system could be developed in Ghana. There were other initiatives by the government. For

instance the PNDC Law 207, enacted by the government in 1988, makes the District Assemblies responsible for the development, improvement, and management of human settlements and the environment in the district. It also empowers them to monitor the execution of projects under approved development plans and evaluate their impacts on people, the local, district, or national economies, and the national environment.

Another significant development with implications for environmental assessment was the inauguration of the *National Environmental Action Plan* (NEAP) held in Ghana in June 1989. The NEAP entails a strategy to address key environmental problems in Ghana and it is being implemented over a 10-year period (1990-2000). The Plan calls for the institution and implementation of an environmental quality control program in the form of environmental assessment of all new investments that would be deemed to affect the quality of the environment.

These efforts demonstrate the commitment of the Ghanaian government to ensure that the environmental impacts of development projects and programs are given serious consideration in the development planning process. Yet, until 1995, there was no formal environmental assessment procedure in Ghana. There was only a systematic environmental review procedure in which the EPC was the main governmental body that decided whether or not an environmental impact certificate or permit should be issued to proponents of undertakings (EPC, 1991). The system apparently fails to protect Ghana's environment from degradation. For instance, a study of the environs of the Prestea Goldfields in Ghana showed serious and diverse effects on the ecology of the area including the River Pra, into which effluent is directed (EPC, 1994).

In the middle forest belt around sections of River Birim, a strange epidemic gradually destroyed human flesh and was linked to the toxic smoke of arsenous oxide and sulphur oxides emitted from the Ashanti Goldfields Mining Company (AGC) Limited (Ofori 1991). A recent experiment revealed a high proportion of arsenic concentration in human hair in Obuasi (EPC, 1994). Again, in the western region of Ghana, residents of Dumasi village took up arms to protect their environment and threatened to take measures against what was alleged to be extensive environmental pollution caused by a nearby mining activity that had received an environmental impact approval from Ghana's Environmental Protection Council. Journalists who visited the village claimed that rivers and streams had turned muddy due to sludge pouring from the mine of Billiton Bogoso Gold Limited. Houses were collapsing from the impact of dynamiting and crops were being damaged by toxic emissions from the mines (Graham, 1993).

These developments brought about such adverse environmental impacts and strengthened the desire for formal legislative backing for environmental impact assessment studies in Ghana. Consequently, an *Environmental Protection Agency Act* (Act 490, 1994) to legally establish an Environmental Protection Agency (EPA) was passed by Parliament in December 1994. Under the *Act*, Ghana's Environmental Protection Council (EPC) was renamed Environmental Protection Agency (EPA) with more powers to ensure environmentally sound development. In accordance with Sections 12 (1) of the *Act*, the EPA:

> may by notice in writing require any person responsible for any undertaking which in the opinion of the Agency, has or is likely to have adverse effect on the environment to submit to the Agency in respect of the undertaking an environmental impact assessment containing such information within such period as shall be specified in the notice.

Thus, Ghana's *Environmental Protection Agency Act* gives the EPA legal backing to request project proponents to conduct and submit environmental impact assessment studies for approval. Where it appears to the EPA that the activities of any undertaking poses a serious threat to the environment or to public health, the Agency may serve enforcement notice on the person(s) responsible for the undertaking to take such steps as the Agency thinks necessary to prevent or stop the activities.

In July 1995, Ghana's EIA procedures were published and formally launched in Accra. This resulted from a combination of several efforts of government officials, financial institutions, local authorities, universities, industrialists, private agencies, nongovernmental organisations, and international bodies notably, The World Bank, USAID, and the Overseas Development Agency (ODA) of the United Kingdom. With the enactment of environmental impact assessment law and formal launching of its procedures, Ghana has moved to the second stage in what Gibson (1994) describes as EA evolution:

- ***Stage 1*** -- Pollution reduction through measures which react to identified local problems, with solutions considered technical matters to be addressed through negotiation of abatement requirements;
- ***Stage 2*** -- EIA stage. Reactive pollution control plus impact mitigation through assessment and project approval. Focus is on narrowly project-specific EIA instead of the broader, proactive EA; and,

- *Stage 3* -- EA stage. Integration of broader environmental considerations in project selection and planning through EA process with obligatory examination of alternatives and socio-economic as well as biophysical effects, public reviews. It involves integrated planning and decision-making for sustainability, addressing policies and programs as well as projects, cumulative effects, with processes devoted to empowering the public as well as ensuring steps towards sustainability.

2.3.2 Environmental Impact Assessment Procedure in Ghana[4]

Ghana's environmental assessment procedure took some guidance from several countries in the West despite contextual differences. These countries include Canada, Australia, Japan, and the United Kingdom (Environmental Protection Agency, 1995). The major activities in Ghana's EIA process include the following: scoping, impact prediction, mitigation measures, documentation, and impact review and monitoring (Figure 2.2).

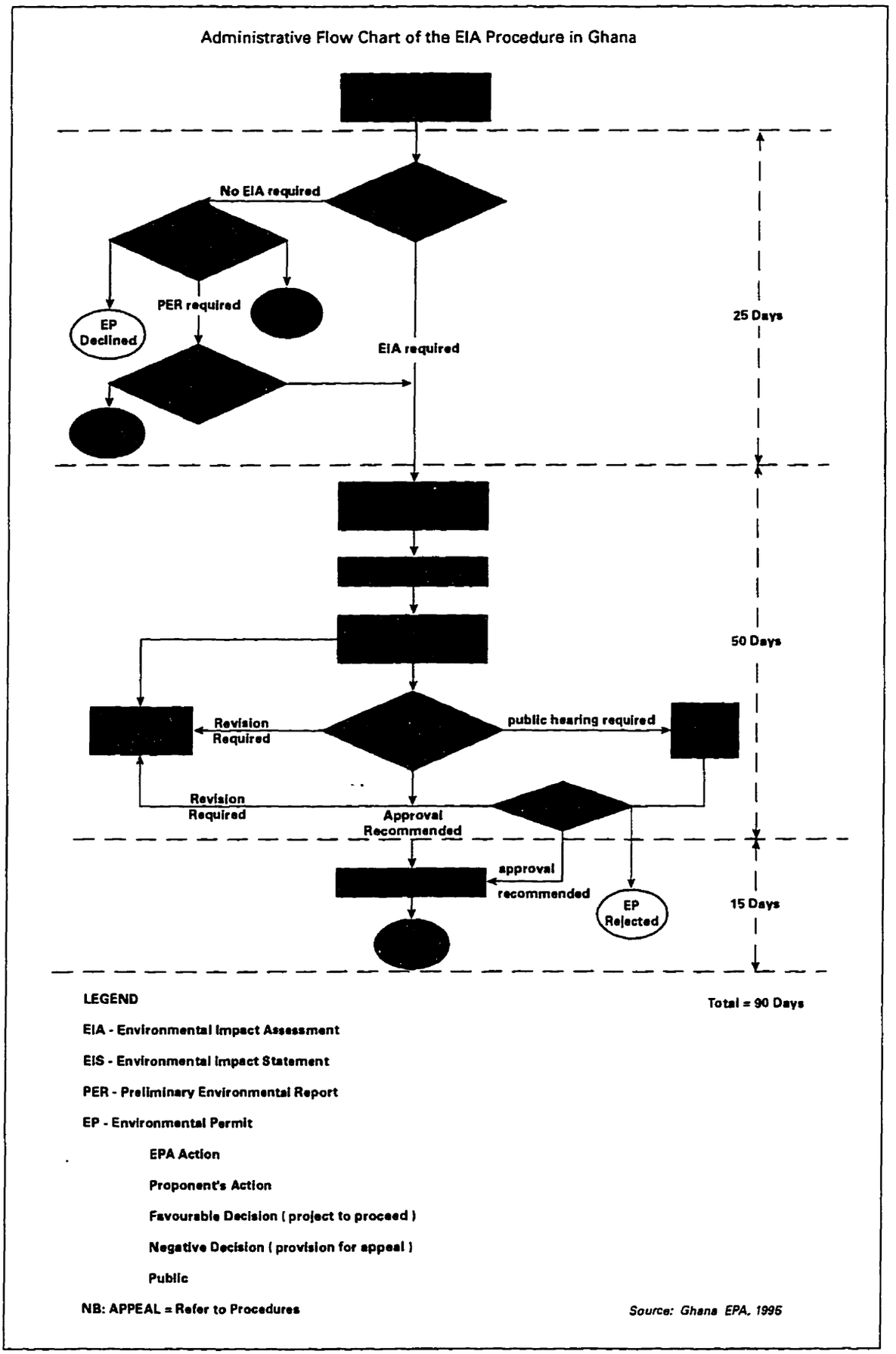
Every undertaking that may have significant impact on the environment is required to be registered with the Environmental Protection Agency (Appendix A). In addition, environmental impact study is mandatory in environmentally sensitive areas such as the following:

- all areas declared by law as national parks, watershed reserves, wildlife reserves and sanctuaries including sacred groves
- potential tourist areas such as historic, archaeological and cultural sites
- habitats of endangered or threatened species and indigenous wildlife
- areas proned to natural disaster and bush or forest fires

The responsibility for determining what constitutes significant impact on the environment lies with the EPA. In making its decision, the EPA consults with a cross-sectoral committee regarding

[4]For details see Environmental Protection Agency (1995).

Figure: 2.2 A Flow Chart of Ghana's EIA Procedure



potential impacts and public concerns. Within 25 days, the EPA is expected to prepare a screening report summarizing its decision which could be one of the following: objection to the undertaking; no objection; preliminary environmental assessment is required; or environmental impact assessment is required.

Where in the opinion of the EPA, a significant impact on the environment may result from the proposed undertaking, the proponent is asked to consult with interested and affected parties and embark on a program of public information in the locality of the proposed undertaking. The proponent prepares a **scoping** report. This involves a rigorous analysis of the possible impacts of a proposed undertaking with a view to identifying those impacts which are worthy of a detailed study. Within 15 days of receiving the scoping report, the EPA must communicate its comments to the proponent of the undertaking. Based on the outcome of the scoping report, a proponent may be asked to commission a full-scale environmental impact study. The study must cover the following (EPA, 1995):

- A description of the proposed undertaking and an analysis of the need or reasons for the undertaking;
- The objective(s) of the undertaking;
- Other options for carrying out the undertaking;
- Alternatives to the undertaking;
- A description of the present environment that would be affected directly or indirectly by the undertaking;
- A prediction of future environmental conditions of the area **with** and **without** the undertaking;
- Proposed measures to prevent or mitigate adverse environmental impacts; and,
- A proposal for environmental management program to cover construction, operation, and decommissioning stages of the undertaking.

Where a draft EIS is found unacceptable, the proponent is asked to re-submit a revised statement at a later date or to conduct further studies and modify the statement as necessary. Where a draft environmental impact statement (EIS) report is found to be acceptable, the EPA sends copies to the appropriate local authority to be made accessible to stakeholders in the locality. A 21-day public notice of the final EIS report is given by the EPA through newspaper advertisement and postings at appropriate public places (Appendix B). If a strong public concern over the proposed undertaking is expressed, the EPA appoints a panel of 3 to 5 persons to hold public hearing and gather more information on the concerns of the public and how best these concerns could be addressed. At least two-thirds of panel members must be residents of the geographic area where the project will be undertaken. The EIS draft report is reviewed by the EPA and a cross-sectoral technical committee including officials of the Ministry of Environment, Science and Technology, and other government agencies. Based on initial terms of reference, EIS reports are graded as follows:

- ***A*** -- Excellent, no tasks left incomplete
- ***B*** -- Good, only minor omissions and inadequacies
- ***C*** -- Satisfactory despite omissions and inadequacies
- ***D*** -- Parts are well attempted, but generally unacceptable
- ***E*** -- Poor, significant omissions and or inadequacies noted
- ***F*** -- Very poor, important tasks poorly done or not attempted

Initial approval is in the form of provisional environmental permit which is issued by the EPA. This allows the proposed undertaking to commence on environmental grounds while attempts are being made to address any inadequacies of the EIS. The permit is valid within a period of eighteen (18) months from the date it is issued. If work does not commence after this period, the permit becomes void and the undertaking must be re-registered. The provisional environmental

permit is regularized within a time-span of up to 24 months of its issuance and project commissioning. The basic requirements for the regularization of the provisional permit are evidence or confirmation of the following:

- Satisfactory commencement of development, operation, and performance review;
- Observance of relevant approval conditions; and,
- Compliance with mitigation and other impact management measures outlined in the EIS report.

In the event that a proponent is dissatisfied with unfavourable decision by the EPA at any stage of the process, there is a right of appeal to the minister responsible for the environment who appoints a board to hear the appeal and take a final decision on the proposed undertaking. The EPA has established an Inspectorate Department in accordance with Section 15 of Act 490. The general objective of the Inspectorate Department is to undertake compliance monitoring, evaluation and enforcement of EIS approval conditions and other provisions of the Act.

2.4 Summary

This chapter is divided into two sections. The first section discussed the concept of "environmental assessment" and indicated that due to the confusion associated with the term, this thesis uses the term "environmental assessment" interchangeably with "environmental impact assessment and planning" and "assessment" and they incorporate broader planning issues. The section also reviewed planning theories underpinning environmental impact assessment. There are logical links between EIA and planning. The discussion also revealed that transactive and social learning theories could form the basis for environmental impact assessment and planning

in most developing countries. In the orthodox court system, good judges consider the specific situations, both of offenders and of victims, before sentencing an individual. The planning profession can learn from this and respond to specific conditions in different parts of the world with appropriate planning theories and concepts.

The second section reviewed the evolution, procedure and constraints to environmental impact assessment in Ghana. In terms of environmental assessment evolution, Ghana is at the EIA stage which focuses on the prediction and assessment of environmental impacts and mitigation of those impacts, usually on project specific basis. Ghana may eventually adopt the broader and more proactive assessment process.

Chapter Three

FIELD RESEARCH AND DATA COLLECTION METHODS

3.0 Introduction

The study explored the potential contribution of indigenous institutions to environmental impact assessment and planning. This chapter provides an explanation of the approach used to investigate the research objectives. It discusses the methods for research design, field research, and analysis and presentation of data. Limitations of the methods are outlined and discussed at the end of the chapter. I am less than satisfied with the research methods and the predominantly descriptive approach taken in this thesis, especially in view of opinions expressed elsewhere that a growing number of field studies on indigenous knowledge are descriptive rather than analytical (Mathias, 1995). Due to the exploratory nature of the research and the difficulties in collecting quantitative data in Ghana, as is the case in most developing countries, qualitative methods were largely utilized and the findings are largely descriptive.

3.1 Scope of the Research

The research proposal was developed in April 1994. After extensive literature review in Canada, an initial survey in Ghana was undertaken between October 1994 and January 1995. The purpose of the initial survey was to explore the feasibility of the project, identify a study area and sample population, establish rapport with potential key informants and conduct informal interviews. The trip was helpful in defining the scope of the research, recruiting and training three (3) local school teachers and another three (3) university students as research assistants, and obtaining informal data. A second survey in Ghana was undertaken between May and September 1995.

During this period, formal interviews were conducted with key informants from the following categories: (a) village elders; (b) indigenous healers, hunters and farmers; and (c) government officials, academicians, environmental sector, and nongovernmental organizations. Research assistants conducted most of the interviews in the second category with close supervision and monitoring by the researcher.

3.2 Research Objectives

The study explored the potential contribution of indigenous institutions to environmental impact assessment and planning. Focusing on Ashanti region of Ghana, the objectives of the research were:

- To identify indigenous institutions and key characteristics;
- To identify indigenous ecological knowledge, beliefs, norms, and practices pertaining to environmental management;
- To identify key environmental problems and constraints to environmental impact assessment;
- To identify potential contribution of indigenous institutions to environmental impact assessment and planning; and,
- To suggest ways to incorporate relevant aspects of indigenous institutions in environmental assessment and planning.

3.3 Key Research Questions

On the basis of the knowledge acquired after extensive literature review and the initial visit to the field, key research questions were refined to include the following:

1. What kinds of indigenous institutions exist in Ashanti region?
2. What is the decision making process and mechanisms for information dissemination and conflict resolution within these institutions?
3. What is the nature of authority, power relations, and spatial interactions in these institutions?
4. What kinds of indigenous ecological knowledge exist in these institutions?
5. What kinds of indigenous religious beliefs and norms in these institutions contribute to

environmental management?

6. What indigenous practices contribute to environmental conservation?
7. What are the problems with Ghana's environmental assessment procedure?
8. What aspects of existing indigenous institutions are relevant to the solution of these problems?
9. How can the relevant aspects of indigenous institutions be incorporated in environmental assessment and planning?

3.4 Designing Interview Guides

Fundamental differences exist between survey research among ethnic groups in Africa and that conducted in developed countries (Appiah-Opoku, 1992; Wanjiku, 1996). For instance, in Canada, survey interviews could be conducted by telephone or by mailing questionnaires to potential respondents. This is not the case in Africa where the bulk of the population do not have telephones in their homes and the postal system is highly unreliable. There is also a problem of high illiteracy rate among the indigenous population and this makes it difficult to obtain effective responses from mailed questionnaires. Chambers (1983) identifies other constraints pertaining to the use of questionnaire surveys in rural and indigenous communities of the Third World. The constraints include the following:

- Questionnaires often embody concepts and categories of outsiders rather than those of the indigenous people, and thus impose meanings on the social reality;
- The misfit between the indigenous and outsider concepts is likely to be substantial and the questions asked may construct artificial chunks of "knowledge" which distort or mutilate the reality in indigenous communities;
- Questionnaire surveys are not good ways of exploring social relationships or identifying causal relationships; and,
- Questionnaires often concentrate on what is measurable, answerable, and acceptable as a question. They do not probe less tangible and more qualitative aspects of respondents lifestyles.

Thus, the use of conventional questionnaire survey as a tool for gaining insights into the lives and conditions of indigenous people in Africa has many drawbacks. For this reason, face-to-face interviewing, using a semi-structured interview guide, was considered a better approach in the context of indigenous Ashanti communities (Appendix C).

The interview guides entailed a set of structured open-ended and close-ended questions. The open-ended questions produced largely qualitative information that were extremely helpful because of the exploratory nature of the research. On the other hand, the closed-ended questions were useful in gathering quantitative data. The questions were ordered in a way that made it easier to conduct ordinary conversation on the subjects of inquiry and in the area of specialty of a key informant. Thus, different sets of questions were used for each category of key informants. The questions reflected the depth and specificity of information required from each category of respondents.

The questions were pre-tested and amended in the light of certain ambiguities and ethical issues that could have led to inadequate and misleading responses or hostilities in the field. Final interview guides and procedures were approved by the *Office of Human Research and Animal Care* (OHRAC) of the University of Waterloo.

3.5 Field Research Methods

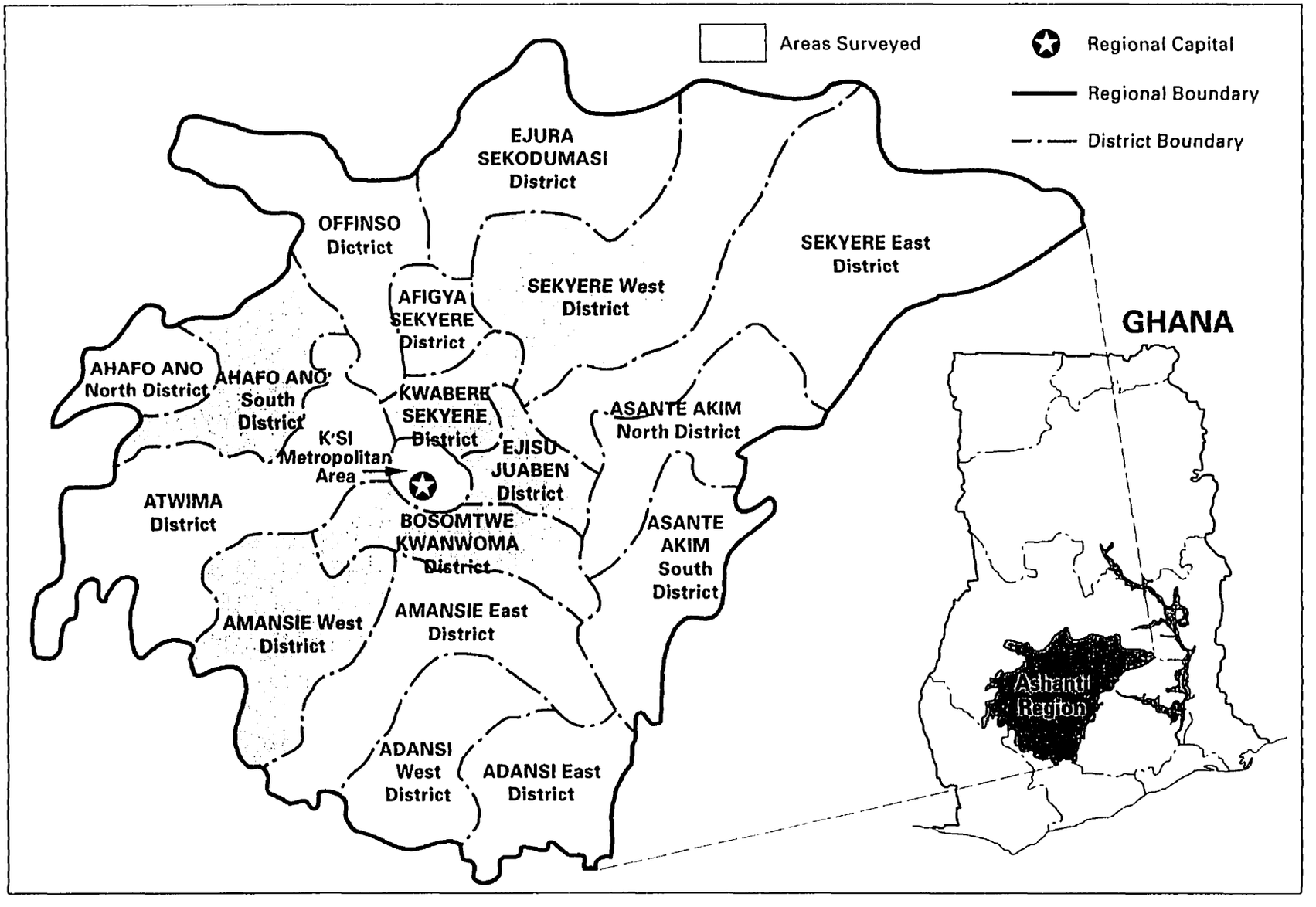
As has already been noted in Section 3.2, the goal of the research was to explore the potential contribution of indigenous institutions to environmental assessment and planning. The exploratory

nature of the field research relates to matters that are central to ethnography and participatory action research. These allow for richness of explanation while making significant contribution to empirical understanding of societal actions and survival mechanisms (Berg, 1989; Patton, 1990; Creswell, 1994).

In deciding on a research approach for the study, the following issues were considered: (a) the exploratory nature of the research objectives; (b) not much has been written about the research topic; and, (a) the need to listen to key informants and build a picture based on their ideas. Based on these considerations, the study largely utilized qualitative methods for data and information gathering. The methods include: formal and informal interviews, transient observations, photographs and audio recording, and content analysis of secondary data. These methods were particularly effective in exploring issues affecting the physical survival of the target population and their relationship with the local environment.

Within the constraint of time and resources, it was not feasible to conduct interviews in all the 18 administrative districts of Ashanti region. A random sampling technique (Babbie, 1990) was used to select 6 districts where interviews were conducted (Figure 3.1). With the help of the six research assistants, a list of 304 potential key informants in 20 randomly selected small towns, villages, and hamlets was compiled. In selecting the districts and settlements for interviewing, attempts were made to obtain ample representation of the cultural, biophysical, and socio-economic conditions of the region. Thereafter, random sampling technique was used to interview 180 individuals (Berg, 1989). These were: indigenous farmers (50); indigenous hunters (50);

Figure: 3.1 Map of Ashanti Region: Showing Areas Surveyed



traditional healers (50); village elders (10) key government officials (5); academicians (5); environmental sector (5); and officials of nongovernmental organizations (5). The list of potential respondents from indigenous institutions was compiled from population census data and local council tax records. However, snowball technique was used to compile the list of potential key informants from government agencies, academic, environmental, and NGO sectors. Although each member on the list had equal chance of being interviewed, some potential informants could not be interviewed for a variety of reasons ranging from unavailability during repeated calls to unwillingness to participate in the survey. For instance, some traditional healers were not willing to divulge any information or "secrets" (as they put it) about their healing practices to the interviewers. Moreover, some traditional priests and priestesses needed permission from their deities or gods. For inexplicable reasons the permission was not granted in some instances. According to Kumar (1987), key informant interviews are appropriate for generating information and ideas pertaining to socio-economic conditions of an area, or characteristics of organizations and institutions including cultural patterns, behaviour patterns, norms and beliefs.

Interviews were preceded by visits to explain the purpose of the survey and to seek permission and indulgence from the village chief and heads of the various institutions identified for the survey. With the interviews endorsed by these respected members of the communities, informants appeared to have greater confidence in the researchers and were therefore willing to cooperate. Potential respondents were assured of the confidentiality of their names and responses. This often involved simple customary rite with "drinks" offered by the researcher to solicit the guidance of local gods and deities for the success of the fieldwork. In most instances, a village chief or head

of an indigenous institution would assemble potential key informants, present them with part of the "drinks" offered, and ask them for their cooperation and active participation in the survey. The researcher and his assistants seized these opportunities to facilitate and conduct focus group discussions. The primary role of the researcher was to facilitate discussions. In most cases, discussions were tape recorded after permission had been granted by the interviewees.

The focus group interviews offered spontaneous responses to the research questions through discussions; provided opportunities for participants to share their feelings, insights, and personal experiences pertaining to the questions asked; and allowed respondents to react and build upon the responses of other participants (Kumar, 1987). The indulgence of some of the group members was stimulated by the comments of others. These were recorded using audiotape. However, notes of the discussions were also taken for the following reasons: tapes could not record the body language of respondents; the notes acted as security against unforeseen problems associated with the tape such as faulty recording or loss of the tape; and more importantly, to cross-check transcribed records. Information and data gathered through key informants were supplemented by secondary data from official government publications and other closely-related literature (Table 3.1).

3.6 Data Presentation

Interview transcripts, field notes, and observations are often not amenable to analysis until the information they convey has been condensed and made systematically comparable (Bruce, 1989). In order to accomplish this, both qualitative and quantitative methods were used to analyze the

Table 3.1: A Framework for Data Collection and Analysis

KEY RESEARCH QUESTIONS	DATA SOURCES	DATA COLLECTION METHODS	MODE OF DATA ANALYSIS
1. What kinds of indigenous institutions exist in the study area?	• Key informants eg. elders academicians, gov't officials, NGOs • Published/Unpublished materials	• Formal/Informal interviews • Content Analysis of secondary data/information	• Qualitative Methods eg. common themes, categories, patterns & relationships
2. What are the key demographic characteristics of respondents?	• Indigenous, healers, farmers, hunters, elders, academicians etc.	• Formal interviews	• Quantitative Methods eg. SPSS
3. What is the decision making process and mechanisms for information dissemination & conflict resolution within indigenous institutions?	• Key informants from indigenous institutions eg. elders, farmers hunters, and healers • Published & Unpublished materials	• Formal and informal interviews • Content analysis of secondary data/information	• Qualitative Methods eg. common themes, categories, patterns & relationships
4. What is the nature of authority, power relations, and spatial interactions among members of the indigenous institutions?			
5. What kinds of beliefs, social norms, ecological knowledge and practices in these institutions contribute to environmental conservation?			
6. What are the key environmental problems and constraints to environmental impact assessment (EIA) and planning in Ghana?	• Key informants, eg academicians, gov't officials, environmentalists, NGO officials etc. • Published & unpublished data and information		
7. What aspects of indigenous ecological knowledge, norms, beliefs, and practices are relevant to EIA and Planning in Ghana?			
8. How can relevant aspects of indigenous institutions be incorporated in EIA & Planning in Ghana?			
9. What are the implications of the findings for EIA & Planning in Ghana and other developing countries?			

data and information gathered from the field. For instance in analysing interview transcripts, the compelling issue for the qualitative method was to discover categories, relationships, facts and assumptions that addressed the objectives of the study. In doing so, the transcripts of interviews, field notes, and related literature were reviewed with careful attention to details. Thereafter, common themes, connections, and patterns of inter-relationships among findings were identified and organized in a simple format. Finally, facts, implications and conclusions were drawn in the light of the research objectives. In translating local dialects of certain plant species to the English language, assistance of a specialist was sought.

Statistical analysis was applied to quantitative data sets that were gathered mainly from closed-ended questions posed to indigenous healers, farmers, and hunters. These include age, gender, and educational status of respondents. However, open-ended questions such as those relating to the ranking of environmental problems and key constraints to EIA practice in Ghana produced quantitative data. The quantitative data were edited, categorized, numerically coded and analyzed to produce frequency counts and percentages.

3.7 Limitations of the Research

Like most empirical research undertaken in developing countries, this study has limitations. The limitations include: (a) the relatively short period of time spent in the field; (b) problems associated with the use of research assistants; (c) reluctance on the part of some key informants to participate in the interview; and (d) health problems encountered by the researcher in the field.

According to Devereux and Hoddinott (1993), most often the longer the time spent in the field, the better the quality of data gathered. This is because longer periods of time in the field often allows for greater flexibility in the research schedule, more time to investigate topics and establish rapport with key informants, and more opportunities to apply triangulation techniques to cross-check information or make comparisons between the differing perceptions of groups within the target population. As noted earlier, this study involved two separate trips for fieldwork in Ghana that covered a combined period of seven months. Considering the tasks involved in the fieldwork, seven months seemed inadequate for a thorough study on the research topic in the Ghanaian context. Efforts were made to reduce the limitations associated with the time constraint.

For instance, instead of covering two or more administrative regions of Ghana, one region was chosen for the study; instead of participatory or ethnographic research which seemed ideal for this kind of research, formal and informal interviews were conducted; despite the advantages of one-person research, the use of research assistants was indispensable; and instead of relying on public transport to reduce cost and conserve energy, a car was rented to increase the pace and flexibility of the fieldwork.

Another constraint relates to the time of interviews. The original intention was to conduct interviews during the day. However, in the field, it soon became clear that the target population, especially indigenous farmers and hunters, were mostly not accessible during the day except on sacred days including Sundays. This imposed a further limitation on the time available for interviewing. As a compromise, arrangements were made for the researcher and his assistants to

stay among the target population and to conduct interviews in the evenings and other times until their tasks were completed. As it turned out, this arrangement helped the research team to quickly establish rapport with respondents. Thus, to a large extent, the arrangement eliminated what Chambers (1983) refers to as "rural development tourism"--a phenomenon of the brief rural visit by outside experts and professionals.

One of the strengths of personal interviewing is that the researcher is often closer to respondents and this enhances his or her understanding of the strengths and limitations of the research. Thus, the choice of whether to work alone, or to delegate part of the interviewing responsibilities to research assistants becomes important for this reason (Devereux and Hoddinott, 1993). In this study, research assistants conducted some of the interviews because interviewing entailed a large volume of work in a relatively shorter period of time. However, efforts were made to reduce the disadvantages associated with the delegation of tasks to research assistants. For instance, research assistants were selected on the basis of the following: (a) familiarity with the area; (b) previous research experience and ability to assist in the transcription process; (c) level of motivation and enthusiasm in the topic of enquiry; (d) honesty, communication skills and adaptability to field situations; and, (e) knowledge of the local language and contextual information about localities chosen for interviews. The six research assistants assisted in the interviewing process. In order to ensure uniformity in the interviewing process, a training workshop was conducted for the research assistants where ideas and techniques for establishing rapport and collecting data from the target population were discussed. Examples of similar interviews were also discussed at the workshop and there was a role-play which allowed

opportunities for each research assistant to answer questions pertaining to the research objectives. In addition, the researcher conducted the first couple of interviews with each research assistant to give a clear idea of the interview procedure and nature of information required.

At the final stage of the fieldwork, the researcher received treatment for *typhoid fever*[5] despite considerable precautions taken before the fieldwork, including immunization against several tropical diseases. The onset of typhoid fever coincided with planned interviews with school children to identify the extent of inter-generational transmission of indigenous knowledge and environmental practices. According to Osherenko (1988), children often learn values in school that conflict with those essential to their native culture--values that stress individuality and competition over indigenous communal relations and cooperation. This was worth exploring in the context of Ghana. The sickness also reduced the number of planned call-backs that could have been undertaken to cross-check data and information gathered before leaving the field.

Other limitations hinged on failing memories of some respondents and transcription problems. For instance, questions related to the age of respondents often met with blank faces and raised eyebrows largely because of failing memories. In this case, respondents were encouraged to make estimations based on their knowledge of popular historical events in the country. The problem with transcription of recorded information relates to the probability of distortions due to linguistic differences. For instance, some of the responses in the local dialect including local names of

[5]This is a deadly disease caused by bacteria *bacillus* through contaminated food or water. A researcher who refuses to eat or drink water in rural Ghana is viewed with suspicion.

plants and animals that could not be easily translated into the English language without some element of simplification or distortions. Therefore, in such cases a specialist assistance was sought.

Chapter Four

RESEARCH FINDINGS

4.0 Introduction

A central theme of the research was to explore aspects of indigenous knowledge, beliefs, norms, and practices pertaining to environmental management. This chapter presents three sets of research findings. Sections 4.1 to 4.3 present the result of interviews conducted with ten (10) village elders. The elders were randomly interviewed at different locations in the study area. The interview questions for this category of respondents covered such areas as nature of indigenous institutions in the study area; authority or power relations and decision-making processes in these institutions; and their belief systems, norms, and practices pertaining to environmental management. None of the respondents in this category was aware of the official environmental impact assessment process in Ghana.

The second set of findings (Section 4.4) is the result of interviews conducted with 150 key informants representing the following: indigenous healers (50); indigenous hunters (50); and, indigenous farmers (50). The interview questions covered such areas as respondents' demographic characteristics, ecological knowledge, beliefs, and norms pertaining to environmental management. Like the elders, none of the respondents in these categories was aware of the official environmental assessment process in the country.

The third set of findings (Section 4.5) is the result of interviews conducted with twenty (20) key informants from the following categories: government officials (5); academicians (5); environmentalists (5); and nongovernmental organizations (5). Respondents in these categories were familiar with Ghana's environmental assessment process. Hence, interview questions focused on identifying key environmental problems and constraints to environmental impact assessment practice in the country. The intention was to explore avenues to incorporate relevant indigenous knowledge and practices.

4.1 Indigenous Social Institutions

The ten (10) elders interviewed were mostly traditional leaders and above 40 years of age. The age and gender distribution of the respondents are shown in Table 4.1. In the communities surveyed, elders are respected and honoured for their age and experiential knowledge.

Table 4.1: Age-Gender Distribution of Respondents (Elders)

Gender	Age Cohort					Total
	31-40	41-50	51-60	61-70	70+	
Male	--	1	2	1	1	5
Female	--	2	1	2	--	5
Total	--	3	3	3	1	10

Respondents revealed the following as the key indigenous social institutions in the study area: kinship system, clan and extended family system, and indigenous land tenure system and religion.

4.1.0 Kinship System

The kin group is a person's initial community. According to all the ten (10) elders interviewed, kinship system in Ashanti is a network of relationships established by blood and marriage. It extends to include the dead and the unborn members of a given local group.

Relationships among members of the kin group are governed by rules embedded in a local culture. There are expectations of rights and obligations within the kinship system. For instance, a person's privilege to become a chief or queen, inherit property or use a piece of land is determined by kinship ties. Members are expected to observe social norms and values within the kin group. There is a high degree of solidarity among members and they tend to live in the same neighbourhood and close to each other.

4.1.1 Clan and Family System

According to the elders, Ashantis are organized through the female line, into *abusua* (clan). The abusua is a subset of the a kinship group. It is a matrilineal unit and descent is traced exclusively through the female line. Each person is said to belong to his or her mother's abusua. Inheritance of property and succession to office within the clan are strictly through the female line.

Clans in Ashanti are often designated by totems, which provide a means of group identification. The totems are said to have been of some service to the ancestors, and are therefore not eaten, harmed, or destroyed by most indigenous people. Another reason is that totems are considered as members of one's clan (*abusua*). Depending on the circumstance of

their birth, individuals in a clan may also have a totem. For instance, an elder revealed that as a taboo, she does not eat the meat of a rat because she is a twin. Other respondents confirmed this taboo and explained that twins in Ashanti risk becoming blind if they ever eat the meat of a rat.

There are eight major clans in Ashanti. These include Asakyiri, Asona, Ekuona, Bretuo, and Asene. The totem of the *Asakyiri* clan are the vulture and the eagle, and this was interpreted by the elders as wisdom or strength; the *Asona* has the elephant, fox, and crow as its totems, and they stand for wisdom and cunning; that of the *Ekuona* is the buffalo, meaning conscientiousness; the Bretuo has leopard as its totem which implies aggressiveness; and the *Asenee* clan has the bat as its totem and it implies diplomacy. Perhaps the desire among indigenous people to preserve their totems contributes to the conservation of biodiversity in the region.

Within a clan is a segment called *fiefo* (family), which consists of immediate relatives, such as a person's brothers and sisters, nephews or nieces, and grandchildren, all in the maternal line. The family is often led by an elderly male called *fiepanyin* (family head) who is respected and recognized as having experiential knowledge and wisdom based on deeper understanding of the value system in the family and the community as a whole. It is within this family unit that the greatest degree of collective responsibility lies. Decisions affecting a whole family are made by consensus at meetings attended by a majority of the members and presided over by the family head.

The family often holds property such as land, cocoa or oil palm plantation for use by its members and regulates the use of such properties through indigenous beliefs, norms, and social sanctions. Through its experienced elders, the family resolves land and other resource-use conflicts involving its members.

4.1.2 Indigenous Land Tenure System

Closely linked to the clan and family system in Ashanti is the indigenous land tenure system. This is the arrangement by which the individual acquires land for farming, housing, and for other uses.

According to the elders, the fundamental principle of indigenous land tenure system in Ashanti is communal or group ownership. Under this system of land tenure, the ultimate or allodial rights to land are usually held corporately by a social group formed on the basis of kinship, clan, or family. Land is normally held by a chief or head of a social group in trust for all members and is popularly referred to as "stool"[6] land. However, in the actual management and exercise of his or her functions with respect to the land, the head is to articulate the consensus of the whole group. A greater portion of land in Ashanti is held under this system of arrangements. The elders also revealed that land in Ashanti is shrouded in spiritual and religious myths and the concept of the **Earth** as a deity or goddess, *Asaase Yaa*, is held by most . They believe that the **Earth** has a power of its own, which could be helpful if propitiated and harmful if neglected. They also

[6]Queenmothers in Ashanti sit on stools. The term is also used in reference to a chief's jurisdiction. Hence "stool" lands.

believe that the land has been given to them by their ancestors and the onus is on them to preserve it and hand it over to their descendants. These beliefs and attitudes to land ownership facilitate collective decision-making about land resources and ensures the conservation of land for future generations.

4.1.3 Indigenous Religious Beliefs and Practices

Eight (8) of the ten (10) elders interviewed were christians and the rest described their religion as paganism. Interestingly, all the ten (10) respondents were unanimous on religious beliefs and practices in indigenous Ashanti society. They explained that indigenous Ashanti religion is not documented like the Bible or the Koran. Rather, it is entrenched in the hearts, minds, oral history, rituals, and experiences of the indigenous people. It is primarily communal, and when one is born into a community, one simply assimilates the religious ideas, attitudes and practices of the community. According to the elders, religion provides the basis of morality among indigenous and serves as a deterrent against aberrant behaviour and as incentive to good conduct.

Three major realms of spiritual or religious influence pertaining to environmental management in Ashanti are: (1) *Onyame* or the Supreme Being (God) or Creator, who is considered as the first among equals; (2) the cult of the human but divinized ancestors of the clan, *asamanfo*; and (3) *Abosom* or divinities and spirits associated with nature.

4.1.3.1 The Supreme Being (God)

According to the elders, there is a general belief among most Ashantis that the Supreme Being or God is the Lord of the Heaven and Earth, the creator of the world and humanity, the giver of life, and the source of all moral values. God is also believed to be all-knowing, eternal, and discerner of hearts. Nothing escapes God. Some of the elders mentioned local proverbs to buttress these beliefs about God: *wo pese woka asem kyere Onyame a, ka kyere mframa* (if one wants to speak to God, one should speak to the wind), which implies that God is all-knowing, present everywhere, and has unlimited or universal power; *Onyame mpe bone* (God abhors evil) implying evil doers should be prepared to face the wrath of God; and *Gye Onyame* (no one except God) implying the omnipotence of God. To a greater extent, these beliefs about God influence the people to do what is right, good, and just and avoid what is wrong, bad, and unjust in daily activities of life including natural resource management.

4.1.3.2 Ancestral Influence on the Living

The elders revealed a general belief among Ashantis concerning the concept of life after death. They believe that after one's death, the departed soul continues to exist among the living. Although the relations and mutual obligations with the living change after one's death, the departed soul continues to exist. A respondent, an elderly woman at *Feyiase,* expressed this idea vividly in a local poem:

> Those who are dead are not dead: they are there in the thickening shadow. The dead are not under the earth: they are in the tree that rustles; they are in the wood that groans; they are in the water that runs; they are in the hut; they are in the crowd. The dead are not dead.

Thus, the ancestors are believed to be spirits who are constantly observing the behaviour of the living; protecting and rewarding those who act in accordance with societal norms, and punishing with misfortune those who exhibit deviant behaviours. Among Ashantis, the ancestors are held in high esteem because they are believed to have led exemplary lives on earth and fulfilled certain standards before their death. The standards include moral uprightness, good behaviour devoid of "unclean" diseases such as tuberculosis or leprosy, and had died at an old age and of a natural cause. Thus, people who departed tragically or died through suicide or "unclean" diseases do not qualify to become ancestors. The belief is that such a death is brought about by a person's hidden crimes, not excluding wanton destruction of the environment and uncleanliness. The desire to be regarded as an ancestor after one's death serves as an incentive for good conduct and environmental cleanliness among the living. Also the people associate old age with experience and knowledge of rules of respectful behaviour.

The ancestors receive constant attention and worship. Libation and food sacrifices are often the norm. For instance, the ancestors are believed to be present at a dining table and Ashantis often acknowledge this presence with sacrifices of part of their meals at the table. Indigenous ace believe that having joined the spiritual world, the ancestors who once lived among the living on earth are in a position to influence life on earth for better or for worse. This belief serves as a deterrent against aberrant behaviour among the living. Burial and ritual sites are believed to be the abode of ancestors and are kept as sacred groves. Resource exploitation activities such as farming, hunting, and tree cutting are prohibited in these places until certain rituals are performed. In most of these sacred groves, economically and socially important ecological species

are clustered as tombstones and they have preserved the biological diversity of the region.

4.1.3.3 Divinities and Spirits

The elders revealed a belief among indigenous ace that divinities and spirits or lesser gods were created by the Supreme God to perform special functions on earth. Whereas the Supreme God lives in cosmic space (sky), the lesser gods or divinities have their places of abode on earth and are believed to dwell in such natural resources as rivers, lakes, seas, rocks, trees, hills, and certain animals. Not surprisingly, in almost all the indigenous communities surveyed, the exploitation of these natural resources is regulated by social norms and taboos.

Indigenous Ashantis regard the Earth and large bodies of water as sacred. For instance, a respondent at *Kuntanase* village near Kumasi revealed that Lake *Bosomtwi* is considered sacred among inhabitants of the surrounding settlements, and this prevents it from becoming polluted with human waste. Tradition forbids the use of boats on the lake. Instead, the fishermen sit on flat boards, rafts, or pieces of wood when fishing (Figure 4.1). Fishing is totally forbidden on certain portions of the lake and also during the months of July and August which is the breeding period for the fish. To the indigenous people, the spirit of the lake is believed to be resting during this period.

There are local taboos or prohibition of activities that are believed to defile the Earth. These include rape or murder in the bush and there are elaborate rituals to propitiate the earth whenever such acts occur. There are also rituals to seek permission from the spirit of the Earth to dig a

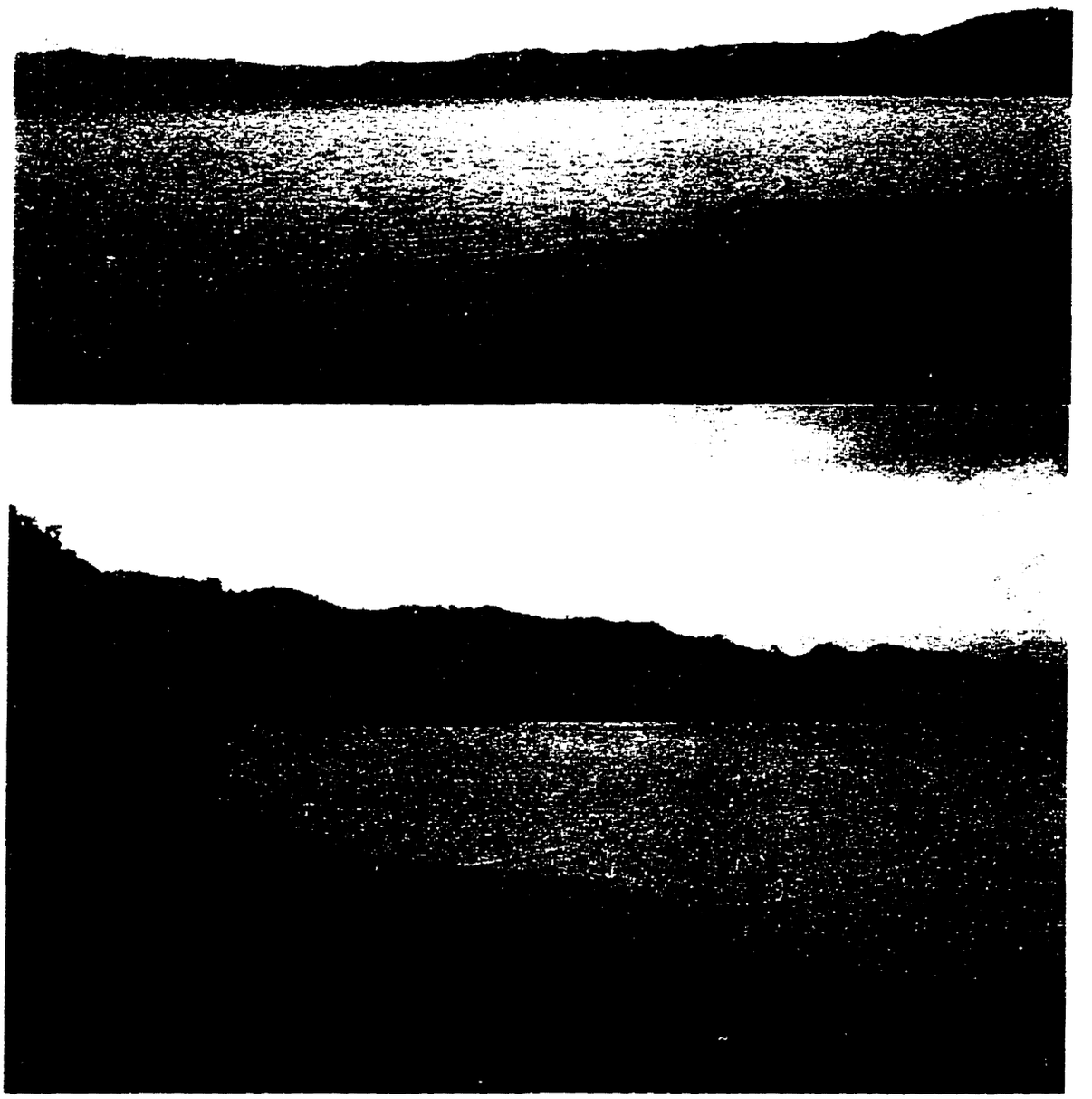


Figure 4.1: Lake Bosomtwi at Kuntanase, near Kumasi. Fishermen sit on flat boards, rafts, and pieces of wood when fishing.

grave for the dead. The general belief is that failure to honour the spirit of the Earth or acknowledge her magnanimity in this way, may provoke anger and vengeance.

The elders also revealed a belief among indigenous ace that human beings are not the only creatures held to be endowed with souls surviving after death. To Ashantis, all living things share this attribute equally with humans though the souls (sasa) of certain animals and plants are believed to be more important than others, just as the soul of a chief or king is deemed more powerful than the almost negligible soul of a servant. Similarly, the souls of mighty trees are held in high esteem and such trees are often personified in proverbs as for instance when the death of a traditional leader or a chief is communicated to the people as odupon atutu (a mighty tree has been uprooted). Also, trees and animals with powerful *sasa* (souls) are believed to be vindictive. A general belief among respondents was that the *sasa* (souls) can interfere in what might otherwise turn out to be a successful life. For instance, the *sasa* can make a man impotent, hasten death, cause madness or bring other hardships to bear on the offender. As a result, certain socio-religious rites and ceremonies are often conducted to propitiate the souls of those animals and trees before or after they are subdued by hunters, herbalists, or wood-carvers.

4.2 Indigenous Political Institutions

The elders regard indigenous political institutions as sacrosanct. This was also the view of a respondent from the academic community who revealed that central governments and constitutions during and after colonial rule in Ghana, have consistently recognized and guaranteed

the operation of indigenous political institutions in the country. Nationally, they are popularly referred to as *chieftaincy* institutions.

These institutions consist of a series of hierarchical levels of authority. The levels begin with household units and progress through the family, lineage, village, town, division, paramountcy, and finally the Ashanti nation. Considerable autonomy is exercised at each level of the political hierarchy with laid-down, though unwritten, procedures. Territorially, every independent polity comprises a principal town or capital, surrounded by outlying subordinate towns and villages. Cases or conflicts are resolved at the household level, through family, lineage, and eventually to the highest authority, the chief, if the need arises (Figure 4.2). Similarly, the chief communicates through the same channel down to the household. Decision-making at each level of authority is based on transactive processes and mutual consensus. According to the elders, this process is aimed at ensuring that persons making decisions will not have cause for regret at a later date. Whenever the chief and his elders sit in council to deliberate on matters affecting the community, each member of the community can make his or her voice heard either in person or through the representative of his or her lineage.

There are also checks and balances within the indigenous political system. For instance, the chief is bound by custom to act with the consent and on the advice of his elders who are themselves representatives from different lineages in the town or village and are subject to similar restraints from members of their lineages. Public opinion is expressed at the council either through the elders who, as heads of lineages, are often in contact with members of their



Figure 4.2: A traditional chief in a full traditional regalia

community or through the *nkwankwaahene* (leader of the masses). There is an important elective principle in the appointment of chiefs that enjoins responsible choices for excellence. This is further reinforced by rules which permit destoolment of chiefs and thus emphasize a principle of accountability in leadership. The elective principle could be broadened and used to galvanize local loyalties and pride in support of a modern system of local government.

The chief and his elders are collectively responsible for the administration of the town or village. Traditionally, they have responsibility to maintain law and order within their village or town. Their gongs are used in summoning people to community meetings and for disseminating information in the communities. A gong is a hanging rimmed metal disk that produces a loud sonorous tone when struck with a piece of wood. The chief's messenger (or village crier) uses this sound to attract villagers attention before announcing a message from the chief. The traditional duties of a chief include the following: (a) maintaining a link between his people and the ancestors; (b) maintaining the moral and ritual purity of his people; (c) acting as the principal custodians of "stool" lands in trust for the dead, the living, and the countless generations yet unborn; and (d) mobilizing the people for communal labour that often entails weeding and cleaning of public places of convenience, and construction of roads, drainage systems, schools, and clinics.

In their role as intermediaries between the living and the ancestors, the chiefs pour libations and perform other rituals to propitiate the spirits of the ancestors. As custodians of stool lands, they oversee the transfer of land to families and other interested parties. The chiefs influence land-use patterns in their communities through their role in allocating land for farming, timber concessions, housing, and communal facilities.

4.3 Indigenous Judicial Institutions

The elders were unanimous in their accounts of the nature and operation of indigenous judicial system in Ashanti. According to them, the system works on a series of levels or a hierarchy of

courts. In simple cases of everyday life experience, an aggrieved person may approach his or her family head and lodge a complaint. This leads to peaceful resolution of a conflict by the family head. There is also a trial by family court consisting of heads of households of an extended family or kinship groups. The family court is an arbitration gathering that settles internal disputes involving such cases as a person's right to the use of natural resources and inheritance of property.

Next in the hierarchy is the village chief's court or divisional court. These courts handle disputes that could not be resolved by a family court. The village chief's house is the last court in a village for serious cases of sacrilege or infringement of taboos in the village. At the apex of the hierarchy are the Omanhene's court and the Asantehene's (King of Ashanti) court. These serve much like appeals court and the supreme court respectively.

The process of arbitration at the indigenous courts is reminiscent of the Western system except that there are no lawyers involved. The parties, as for example in a land dispute, are asked to make preliminary payments, *dwomtadie*, a kind of earnest money. Witnesses in the case are sent into concealment until the parties have made full statements in court and have been questioned by the open court. They are then called upon to give evidence and are cross-examined by parties to the dispute and the court's panel consisting of the chief, queen, and elders.

In reaching a verdict, the chief considers all the issues and evidence before the court, and the advice of all the subchiefs or elders at the court. In situations that lack clarity, the courts are

guided by precedents, and the experiential knowledge and wisdom of the elders. At the conclusion of a trial, the guilty party is often fined and also asked to pacify the offended party. Often, the court imposes fines on culprits to serve as a deterrent to deviant behaviours in the society. This system of arbitration is particularly useful in resolving land disputes and enforcing social prohibitions or taboos and norms pertaining to environmental conservation and management.

4.4 Indigenous Economic Institutions

This section presents the second set of research findings. The findings are based on both qualitative and quantitative analysis of data and information collected from key informants in the following categories: indigenous healers (50); indigenous hunters (50); and, indigenous farmers (50). Other categories of indigenous economic institutions identified in the study area include: wood carving; blacksmithing; pottery making; cotton or *kente* weaving; and palm-wine tapping, which produces indigenous wine or syrup from the palm tree.

4.4.0 Indigenous Healing Practices

The distinguishing characteristics of indigenous healers in the study area is that they provide health care with plant, animal, or mineral substances and methods that are based on socio-cultural and religious beliefs of the local people. A total of thirty-four (34) males and sixteen (16) females were interviewed and their average age was 51 years. The age and gender distribution of respondents in this category of indigenous occupation are shown below in Table 4.2.

The following categories of indigenous healers were interviewed: herbalists (28), traditional priests and priestesses (9), traditional birth attendants (6), and bone-setters (7). Most of the healers (64%) indicated that they have more than 10 years of experience in the profession. Some of the healers practice farming and hunting as their minor occupation.

Table 4.2: Age-Gender Distribution of Healers

Gender	Age Cohort					Total
	<40	41-50	51-60	61-70	70+	
Male	4	8	12	8	2	34
Female	--	3	8	5	--	16
Total	4	11	20	13	2	50

The herbalists are knowledgeable in the medicinal uses of herbs and other naturally occurring substances. Although traditional priests and priestesses are also knowledgeable in medicinal uses of herbs, they operate under the guidance of their deities. Because of their connection with deities, most of the traditional priest and priestesses claimed to have control over diseases that are shrouded in mystery. Traditional birth attendants are women who have specialized in the delivery of babies and are knowledgeable in prenatal and postnatal medicinal herbs. Bonesetters have specialized in healing patients with fractured bones using herbs and other naturally occurring substances.

The nature and duration of apprenticeship or training of respondents differed in each category of healing practice. For instance, the priests and priestesses revealed that entry into their profession is by divine calling of a deity and apprenticeship or training often lasts 3 years. The first year is focused on ceremonial ablutions with herbal concoctions. There are herbs that strengthen the ankles to withstand the strains of traditional priesthood dancing (Figures 4.3a and 4.3b). The dance serves as a medium for establishing rapport with the spiritual world. Certain herbs are rubbed on their eyes, and this enables them to connect with the spiritual world. In the second year, the apprentice learns the names and therapeutic properties of medicinal plants. In the third year, they learn the art of divination and the psychology of diseases. Other categories of healers, particularly bone-setters and traditional birth attendants received informal training mostly from either a relative or family friend and lasted on average, 5 years.

According to the healers, formal education is helpful but not a requirement in their profession. What is important is one's ability to pay attention to details. Not surprisingly most of the healers (68%) had no formal education and they rely on the services of either their children, relatives, or friends to keep records of their patients (Table 4.3). However, a key informant from the Traditional Healers' Association revealed that the high illiteracy rate among indigenous healers often affects measurements of medication and pose as a barrier to collaborative research with formal agencies.



(a)

(b)

Figure 4.3:
(a) A traditional priest possessed by deity
(b) A traditional priesthood dancing. The ankles are strengthened with herbs to withstand stress

Table 4.3 Educational Status of Indigenous Healers

EDUCATIONAL STATUS	FREQUENCY	PERCENTAGE (%)
No Formal Education	34	68.0
Elementary Education	12	24.0
Secondary/Post Secondary	4	8.0
Tertiary/University	0	0.0
Total	50	100.0

The Traditional Healers' Association is a nongovernmental organization which regulates the activities of indigenous healers and organises workshops for members to interact and up-date their knowledge. Through the activities of this organization, some of the healers have learned to combine scientific and indigenous methods in their healing practice. For instance, a bone-setter revealed that she now encourages her patients to have x-rays before and after treatment. Also, a traditional birth attendant revealed that she now uses sterilized instruments and this has significantly reduced complications associated with deliveries. Majority of the healers (52%) indicated that they use between 10 and 20 plant species for health care, and 8% use between 31 and 50 plant species (Table 4.4).

According to the healers, every illness or disease in their community is associated with either: (a) natural causation; (b) spiritual or supernatural forces; or (c) the result of socially unacceptable behaviour. Hence, their healing methods are geared towards neutralizing these forces.
The healers prepare their medications from either the leaves, bark, stem, or root of plants. For instance, fevers are treated with the leaves of *Nunum (Ocimum gratissimum or O. viride)* plant.

Table 4.4: Number of plant species used by indigenous healers

ESTIMATED NUMBER OF SPECIES	INDIGENOUS HEALERS	
	FREQUENCY	PERCENTAGE (%)
0-10	6	12.0
11-20	26	52.0
21-30	14	28.0
31-40	3	6.0
41-50	1	2.0
51+	0	0.0
Total	50	100.0

The aqueous decoction of *Otan-nuro (Trichilia monadelpha)* mostly found in moist parts of secondary forests is used as liniment for arthritis and for the treatment of yaws, sores and ulcers. Similarly, the roots and leaves of *Kakapenpen (African rauwolfia)* which is common in secondary forests are used as sedative and tranquillizer in psychiatric conditions. The African pepper, locally known as *Hwenteaa (Xylopia aethiopia)* is used as additive to other remedies. It is believed that *Hwenteaa* has antifungal and has a broad spectrum antibiotic action.

Other medicinal plants revealed by the healers include: *Nsusuaa (Solanum torvum)* which occurs as a common weed of secondary forest clearings at road sides and waste lands is used as haemostatic after child birth and for coughs especially in children; *Awonwene (Bitter leaf or Vernonia amygdalina)* commonly found in outskirts of most villages is used as analgesic and also for the treatment of upper respiratory tract infections; and, *Ananse nkatee (Desmodium herb)*

which occurs in moist and shaded places in the forest, is used for the prevention and treatment of asthmatic conditions. According to the healers rituals are often performed to pacify the souls of certain plants whose original abode are destroyed in the quest to provide health care to humans.

Besides medicinal plants, majority of the healers (56%) use specific parts of certain mammals, reptiles, and amphibians for healing purposes. These include snail shells, animal fat, worms, and bones of wild animals. The healers complained that certain medicinal plant and animal species have been particularly scarce because of deforestation and bushfires in the local environment. In some cases, they rely on the outside markets for their supply of medicinal plants and animal species.

A key government official revealed that with increasing disappearance of forest species and biodiversity in the Ghana, the conservation of forests and medicinal plants has become an important issue in the country and the government has expressed support by establishing the Centre for Scientific Research into Plant Medicine at Mampong Akuapem (Figure 4.4). The centre operates under the direction of the country's Ministry of Health and it researches the medicinal value of plants. The Ministry of the Environment has put together a strategic and action plan for the management and use of Ghana's total biodiversity.



Figure 4.4: Centre for Scientific Research into Plant Medicine at Mampong Akuapem, Ghana.

4.4.1 Indigenous Farming Practices

Unlike the healers, most of the farmers interviewed were younger with an average age of 41 years. Respondents consisted of thirty-two (32) males and eighteen (18) females. The age and gender distribution are shown in Table 4.5. Like the indigenous healers, most of the farmers (62%) had no formal education (Table 4.6). In addition to farming, 78% of the farmers do some hunting and gathering, and 88% indicated knowledge of two or more medicinal plants.

Table 4.5: Age-Gender Distribution of Indigenous Farmers

Gender	Age Cohort					Total
	<40	41-50	51-60	61-70	70+	
Male	10	12	9	1	--	32
Female	6	9	3	--	--	18
Total	16	21	12	1	--	50

Table 4.6: Educational Status of Indigenous Farmers

EDUCATIONAL STATUS	FREQUENCY	PERCENTAGE (%)
No Formal Education	31	62.0
Elementary Education	18	36.0
Secondary/Post Secondary	1	2.0
Tertiary/University	0	0.0
Total	50	100.0

The distinguishing characteristic of indigenous farming practices is that they are largely based on local values, attitudes, beliefs, behavioural patterns, and biophysical conditions. The most common indigenous farming systems are **intercropping** and **bush fallowing**. Intercropping involves the planting of different crops in the same field in a farming season. The farmers indicated that they often plant between 6-15 crop species sequentially on the same farmland. The mixture of crops is often made up of varieties that have different moisture, soil nutrients, and resilient levels. According to respondents, the practice ensures that the entire farm is not

devastated in case of disease outbreak or pests attack. It also facilitates recycling of nutrients through crop and weed residues and ensures constant vegetative cover.

The farmers who practice bush fallowing revealed that they often abandon their farm plots after a 2 or 3 year period of cultivation. This allows for regrowth of natural vegetation and enrichment of the soil through decomposed organic materials. Thereafter, the farmers return to the same plot for another cropping phase. The farming method is largely slash-and-burn using simple farm implements such as the hoe, axe, and cutlass. Some of the farmers revealed that the use of these implements minimizes exposure of the subsoil to the tropical sun. Larger trees, stumps, and roots are not removed because they are believed to protect the soil from leaching (Figure 4.5). Average farm size is between 1-3 acres.

The farmers relate their farming activities to local biophysical and climatic conditions in Ashanti. The main dry season occurring during January and March, marks the beginning of the preparation of farm lands for sowing during the rainy season. During the pre-harvest season, from July to September, farming activities are restricted to clearing weeds and attending to crops. The main harvest season is from October to December, and it is the period for both intense harvesting of crops and family reunion as most cultural festivals are held in December.

Access to farmlands does not seem to pose a problem for the farmers. Most of them (70%) indicated that they own their farmlands and these were acquired through communal or family arrangements. The rest (30%) were mostly migrant farmers who rent farmland through the

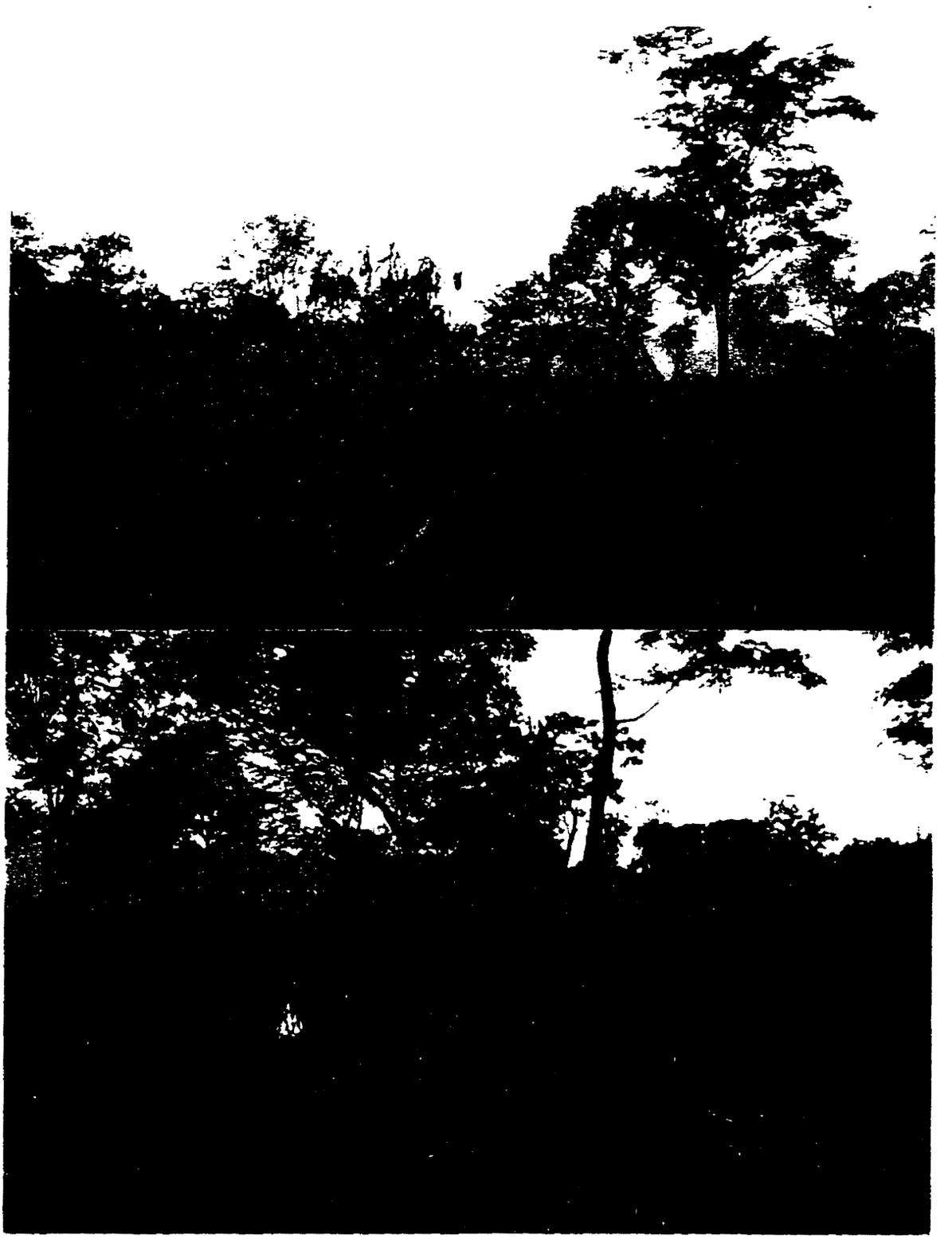


Figure 4.5: Indigenous farmer using the slash-and-burn method

following local arrangements: (a) a half-share system *(abunu)* or (b) a third-share system *(abusa)*. The first arrangement requires the farmer to give-up half of the total farm produce as payment for the use of the farmland. The second arrangement allows the landowner to receive one-third of the total farm produce.

Like the healers, the farmers revealed in-depth ecological knowledge. They are able to control crop diseases and pests attack using indigenous methods. For instance, wood ash is sprinkled on the leaves of vegetable plants as a protection against pests attack. Another technique involves spacing of farm crops. According to some of the farmers, wider spacing of crops decreases the incidence of plant diseases. The farmers also use traps and scare tactics such as planting improvised human statues or effigies on the farm to ward off such pests as rodents and birds. In addition, selective destruction of infected plants is used by some of the farmers. A key government official revealed that this method was introduced by the colonial government in the early part of 19th century as a policy to stop the spread of cocoa pod diseases in the country. During that period, indigenous farmers vehemently opposed this policy with death threats to enforcement officers.

The farmers are able to successfully identify precursors of climatic and weather conditions. For instance, some of them disclosed that there is always a strong possibility of prolonged dry season when a vulture is seen incubating at a time when rainfall is widely expected. Other precursors of climatic and meteorological conditions include observation of certain species of ants, frogs, or cloud movements at certain time, day, or month. The farmers also revealed a good knowledge

of the characteristics of soils in the local environment. According to them, indicators of soil fertility include the following: presence of clay, low proportion of sand and moisture, decayed organic matter or black colour, earthworms, and certain plant species (eg. *Asaman-ntorowa* or *solanum torvum*). Conversely, they associated a high proportion of sand or gravels with infertile soils.

Another element of ecological knowledge among the farmers pertains to the use of forest products for such basic necessities as household tools, food, medicine, fuelwood, and charcoal. The household tools include ladles, grinding pestles, mortars, basket, brooms, stools, soaps, and chewsticks. Chewsticks are mostly obtained from the *Garcinia epunctata (nsokor)* tree and are used as substitute for toothpaste. Brooms are made from the ribs of oil palm fronds and are mostly made by women and teenagers. Similarly, soaps are made from plantain peels or cocoa pods and palm oil mostly by women. Baskets are made from the branches of palm trees by men and teenage boys. Bamboo *(Oxytenanthera abyssinica)* and Odum *(Milicia excelsa)* are used for fencing and house construction mostly by men. Traditional stools or chairs are made from the *Osese (Funtumia sp.)* and *Nyame dua (Alstonia gongensis)* trees and are often made by men and teenage boys.

Like the indigenous healers, the farmers identified bushfires and deforestation as the major environmental problems in their communities. Some of the farmers attributed the problem of deforestation to commercial lumbering and the activities of charcoal producers; the total dependence of the communities on firewood as a primary source of energy; and uncontrolled

bushfires. Bushfires were attributed to inexperienced game hunters and palm-wine tappers who often use fire as the major tool.

Others revealed that because of increases in family sizes and a high demand for farmland, forests are being cleared at an alarming rate. In some situations, population pressures are so great that forests along river banks have been cleared for farming despite a traditional belief that this disturbs the river's peace of mind. When the rivers are disturbed, they often respond by drying up and creating acute water shortage for domestic and farming activities. Some of the female respondents revealed that during this period, they travel longer distances with their teenagers in search of drinking water and they often spend between 2-3 hours on a round trip to streams.

The farmers observe traditional holidays during which the spirit of the Earth is believed to be resting. These days are regarded as sacred and it is a taboo to work on the farm during these holidays. The farmers believe that failure to observe these norms may provoke anger from the spirit of the Earth and may result in poor harvest or physical injury. The farmers usually seize this opportunity to attend to social and community issues. Community meetings are often held during sacred days. There are other communal taboos with regards to the use of certain natural resources. For instance, at *Akyeremade* village, fish from River *Bafo* are not eaten by inhabitants of the village even though this is not the case downstream. At *Akyeawkrom* near Ejisu, it is a taboo to use water from the *Baduafua* Stream for domestic purposes. However, respondents could not give any reason for these taboos.

A nongovernmental organization that represents the interests of farmers in the country is the Ghana National Farmers Council but it seems to have lost touch with subsistence farmers. For instance, all the indigenous farmers who were interviewed indicated that they were not aware of the activities of this organization.

4.4.2 Indigenous Hunting and Gathering

Respondents in this category of indigenous institution consisted of forty-one (41) male hunters and nine (9) female gatherers. Their average age was 41.5 years. The age-gender distribution of respondents are shown in Table 4.7. Like the indigenous healers and farmers, most of the hunters (86%) had no formal education (Table 4.8). In addition to hunting and gathering, almost all the hunters and gatherers (96%) were also engaged in farming and they all indicated knowledge and use of two or more medicinal plants. To some extent, the indigenous Ashanti communities are subsistence economies and the inhabitants depend largely on the local environment for most of their nutritional requirements.

Table 4.7: Age-Gender Distribution of Hunters

Gender	Age Cohort					Total
	<40	41-50	51-60	61-70	70+	
Male	15	13	10	3	--	41
Female	2	6	1	--	--	9
Total	17	19	11	3	--	50

Table 4.8: Educational Status of Indigenous Hunters

EDUCATIONAL STATUS	FREQUENCY	PERCENTAGE (%)
No Formal Education	43	86.0
Elementary Education	7	14.0
Secondary/Post Secondary	0	0.0
Total	50	100

Respondents revealed that hunting and trapping of game are risky undertakings and often require some form of training. They learned the profession under the guidance of a relative, mostly the father. Hunting for game is done mostly by adult men and takes place during the day or night. At night, a hunter uses acetylene headlamps to blind a quarry and before it is shot. Day time hunters are mostly farmers who share their time between farm work and searching for game. Some of the hunters (40%) disclosed that they often use hunting dogs to assist in trailing and trapping a game.

The hunters revealed that they set traps along the borders of farm plots and the forest purposely for rodents or herbivores. There are also traps for birds. Traps are made from wooden sticks and ropes obtained from specific trees and climbers in the forest. These include *foto (Glyphaea brevis)* and *Ofema (Microdesmis puberula)* trees. The hunters disclosed that they often entice a game to a trap by improvising its habitat or placing its best food around the trap and this requires detailed experiential knowledge of the feeding ecology and behaviour of the species sought.

Also, the hunters are able to locate game by following such traces as dung pellets, marks left behind in feeding on or scratching vegetation and crops, tracks in the soil, sounds made by the game or cries of birds that are aroused by its presence. According to the hunters, these signals often tell exactly when and where the game passed a spot, its species, age, size and mood, and whether it was alarmed and running for safety. The hunters also told stories about the life cycle of certain animals that they often hunt including the kinds of food they eat, methods of searching for food, pregnancy and gestation period, natural habitat and average lifespan.

Hunting and trapping are regulated by indigenous beliefs and taboos, most of which ensure humane and sustainable hunting practices. For instance, a hunter revealed that male hornbills (birds) feed their mates (females) during incubation and this often occurs in January and February. For these reasons, it is a taboo to kill these birds during this period. The hunters revealed other taboos that prevent them from killing a game. They include the following circumstances:

- When the game/animal is pregnant or nursing young ones;
- Indication of thirst as when a game is spotted drinking from a stream (except after it has drunk from the stream);
- When the game is mating;
- On sacred days because it is believed that the forest is resting;
- During the closed-season (June to September) which is the breeding period of most game; and,
- Hunting is a taboo in sacred groves.

In addition, an elderly hunter revealed that, not long ago, hunters were in the habit of conducting funerals for certain animals with the sole intention of making the vindictive *sasa* of

these animals passive and innocuous in the affairs of the living. The animals include the elephant *(ọsono)*; the bongo *(ọtromo)*; and the duiker (ewiyo or ọkwaduo). Although the funeral ceremonies for animals were less elaborate compared to those of humans, it discouraged young and inexperienced hunters from killing these animals.

Two examples of environmentally degrading hunting methods were revealed. The first relates to isolated dug-out pits or trenches in the forest to trap wandering game. The hunters admitted that this method is regarded as unsafe because of the greater tendency to trap innocent people. The other is a communal hunting technique employed by teenage and inexperienced hunters, mostly age-mates. The group often sets fire to the forest to flush out game. The game is chased and killed with clubs as they ran away from their hiding places. According to the hunters, this method is also unsafe and was singled out as major cause of undesirable and destructive bushfires in the country.

Gathering of forest products is mostly done by women and teenagers. According to those interviewed, these activities take place during the day and are often neither organised nor coordinated except for occasional group exploitation of snails and mushrooms. Several varieties of snails, mushrooms, leaves and firewood are gathered from the forest. Fruits are mostly gathered by teenagers and they include *Borọfẹ (Pawpaw, Carica papaya)*, *Mango (Mangifera indica)*, *Kwadu (Banana)*, and *Paya (Avocado pear)*. Leaves that are mostly gathered and used as vegetables include *Kontomire (Cocoyam leaves)*, and *Bankye ahaban (Cassava leaves)*. Tree species collected and used as fuelwood include: *Ẹsa (Celtis zenkeri)*, *Ofuntum (Funtumia*

elastica), Agyama (Alchornea cordifolia), and *Wawa (Triplochiton scleroxylon).* In this sense, women and teenagers are chief repositories of current knowledge about the use of trees and other forest products.

Respondents revealed that success in gathering depends largely on experience and knowledge of the ecological conditions associated with each forest resource. For instance, snails and mushrooms are often available in the rainy seasons and are located in moist semi-deciduous forests. A typical hunting expedition occurs in the rainy season, and the experienced gatherer may collect about 350 snails per day. However, a respondent revealed that output of snails has declined over the years and this was attributed to frequent bushfires and prolonged dry seasons in the local environment.

4.5 Environmental Problems and Constraints to EIA Practice in Ghana

This section presents the third set of findings pertaining to the key environmental problems and constraints to EIA practice in Ghana. The findings are based on formal and informal interviews conducted with twenty (20) key informants from the following categories: government officials; academicians; environmentalists; and, nongovernmental organizations.

Unlike members of the indigenous institutions, key informants in this category were younger and highly educated. Their average age was 35. The youngest was 26 years of age and the oldest, 51 years (Table 4.9). All the respondents had formal education and majority (60%) have had university education (4.10). Seven (7) of the respondents with university education held doctorate

degrees and this included three (3) university professors. Again unlike members of the indigenous institutions, this category of respondents had varied disciplinary backgrounds and they included the following: agronomists, land use planners, sociologists, political scientists, anthropologists. environmentalist, geographers, biologist, meteorologists, and engineers (Table 4.11).

Table 4.9: Age-Gender Distribution of Key Government Officials & Other Respondents

Gender	Age Cohort					Total
	21-30	31-40	41-50	51-60	60+	
Male	2	6	4	2	--	14
Female	1	4	1	--	--	6
Total	3	10	5	2	--	20

Table 4.10: Educational Status of Key Government Officials & Other Respondents

EDUCATIONAL STATUS	FREQUENCY	PERCENTAGE (%)
No Formal Education	0	0.0
Elementary Education	0	0.0
Secondary/Post Secondary	6	30.0
Tertiary/University	14	70.0
TOTAL	20	100.0

As an attempt to have some insight about environmental problems in Ghana, respondents were asked to rank the three most pressing environmental problems in the country. The question was open-ended and this allowed for more possibilities. The responses are grouped into eight major

categories, namely: water pollution, air pollution, waste management, land degradation, deforestation, bushfire, flooding, and other (Table 4.12).

Table 4.11: Disciplinary Background of Key Government Officials & Other Respondents

BACKGROUND	FREQUENCY	PERCENTAGE (%)
Agronomists	3	15.0
Anthropologists	2	10.0
Meteorologists	1	5.0
Planners	4	20.0
Geographers	3	15.0
Biologists	2	10.0
Sociologists	1	5.0
Env. Scientists	2	10.0
Pol. scientists	1	5.0
Others	1	5.0
TOTAL	20	100.0

Table 4.12: Ranking Environmental Problems in Ghana

CATEGORY	RANKING			TOTAL RANKING
	1	2	3	
	FREQUENCY			
Water Pollution	2	3	3	8
Air Pollution	2	1	2	5
Waste Management	5	6	4	15
Land Degradation	1	1	2	4
Deforestation	5	5	4	14
Bushfire	4	2	3	9
Flooding	1	1	1	3
Other	0	1	1	2
TOTAL FREQUENCY	20	20	20	60

The three (3) most pressing environmental problems identified by this group of key informants are waste management, deforestation, and bushfires. Other pressing problems identified are water and air pollution and land degradation. Flooding is among the least pressing environmental problems identified although the researcher witnessed a serious flooding in Accra during the field work in Ghana. A key informant described this as an isolated incident. The seriousness of waste management problems in the country was described by a key environmentalist. According to him, most urban dwellers in Ghana including politicians treat wetland as wasteland that is good for only landfill or garbage dump. The wetland is thus dumping grounds for the wastes of towns, cities, and metropolitan areas. For instance, the *Korle* lagoon, the largest water body in Accra District has been officially declared dead after several years of receiving garbage and sewage including waste oil from garages and textile firms operating near its banks. Ghana recently obtained a loan from a Saudi Arabian bank for the sole purpose of cleaning up the *Korle* lagoon. It was also revealed that although the *Subin* River in Kumasi was considered clean about thirty (30) years ago, at the present time, garbage trucks from the Kumasi Metropolitan Council dump human wastes into the Subin River in broad day light.

Deforestation and bushfire are serious problems because of the socio-cultural and economic importance of forests. For instance as noted in Section 4.4, the forests provide resource substitutes which are scarce or physically and economically inaccessible in indigenous communities. These include forest products for such basic necessities as household and farming tools, food, medicine, fuelwood, ladles, soaps, and chewstick which is used as substitute for toothpaste. The forests also provide congenial environments which support rural food systems by

way of productive agricultural land opportunities. No doubt, representatives of indigenous economic institutions (healers, hunters, and farmers) who were interviewed also identified deforestation and bushfires as the major environmental problems in their communities. As noted in Section 1.6, Ghana's closed forests shelter over 2,100 plant species and numerous endangered species and need some protection. As well, the country's economy derives its strength from sustainable exploitation of forests and other natural resources.

Respondents were also asked to rank three (3) most pressing constraints to environmental impact assessment practice in the country. Again, to allow for more possibilities, the question was open-ended. The responses are grouped into eight (8) major categories. These include (Table 4.13) : (a) lack of local EIA experts; (b) lack of organized scientific data; (c) ignorance of EIA law and procedures and illiteracy; (d) lack of appropriate EIA methods; and, (e) institutional problems particularly, over-centralization of EIS reviews and approvals.

Based on the frequency of rankings, the most pressing constraint to EIA practice identified is **lack of organized baseline data**. This is followed by **lack of local EA experts** and **institutional problems** respectively. Other key constraints identified are the general lack of environmental awareness in the country, land management problems, and ignorance of the existence of EIA law and procedures in the country and high rate of illiteracy among a section of the population. Commenting on the lack of local EA experts, a key informant from the Environmental Protection Agency (EPA) revealed that the first environmental impact statement (EIS) was received in 1990. By June 1995, a total of one-hundred (100) EISs had been received.

Table 4.13: Key Constraints to EIA Practice in Ghana

CONSTRAINTS	RANKING			TOTAL RANKING
	1	2	3	
	FREQUENCY			
Lack of Local EA Experts	4	3	3	10
Lack of Environmental Awareness	3	2	2	7
Ignorance of EA & Illiteracy	1	1	2	4
Lack of appropriate EA Methods	2	1	1	4
Land Management Problems	2	3	2	7
Lack of Organized Baseline Data	4	5	5	14
Lack of Intervenor Funding	1	2	1	4
Institutional Problems	3	2	3	8
Other	0	1	1	2
TOTAL FREQUENCY	20	20	20	60

Only twenty-two (22) of these reports were acceptable and these were mostly prepared by foreign consultants. The rest were rejected and returned for thorough revision because of the following deficiencies:

- Lack of organized scientific baseline data and information;
- Assessment and prediction of impacts magnitude were largely generalizations with little or no relation to the project environment;
- Potential adverse effects of proposed undertakings and alternatives were often ignored or given scanty attention; and,
- Lack of public participation.

According to the EPA official, these deficiencies unduly prolong the EIA process and created embarrassment to both consultants and proponents. In some cases, officials of EPA were compelled to conduct scoping of projects on behalf of proponents. To reverse this trend, the EPA

has been organising training workshops to train local consultants in the preparation of EIS. The first two training workshops were run in July 1995. Each workshop lasted five (5) days and forty-nine (49) participants were involved. They included planners, sociologists, civil engineers, mining engineers, architects, and economists.

Respondents attributed the lack of organized baseline data and information to the general economic decline in the country. According to Rothchild (1991), from 1974 to the late 1980s, the Ghanaian economy was in decline and was unable, for a combination of structural and policy-based reason, to seize the initiative and overcome the constraints on choice. Heavily dependent upon external sources for her imports of petroleum, machinery, and manufactured items and on foreign markets for her exports of cocoa, timber, and diamond, Ghana's economy is vulnerable to the vagaries of world market forces. In addition, declining agricultural and industrial productivity has contributed substantially Ghana's economic malaise. This has greatly affected data gathering operations and capacities of most institutions, especially at the regional and local levels. For instance, large-scale and up-dated maps are often not available. Moreover, the available data are often of poor quality and out-of-date. The last population census was conducted in 1980 and most of the demographic data and socio-economic information are outdated. Particularly absent are data on the following: (a) general groundwater information and wetland ecosystems; (b) soil, water and air quality; (c) emission inventory of pollutants; and (d) noise pollution. In addition, poor coordination among various institutions often results in duplication of data collection efforts.

Respondents identified over-centralization of environmental impact assessment reviews and approvals in Accra as a major institutional problem. According to them, this often results in unnecessary delays and other inefficiencies. For instance, officials reviewing the EIS are often not familiar with current biophysical and socio-economic conditions and attitudes of local people towards a proposed undertaking. However, a key official at the EPA revealed that the agency is aware of these issues and has recently set up Regional Offices in each of the ten (10) administrative regions of the country. The Regional Offices have been instructed to establish Environmental Management Committees at the district and community levels. These committees are expected to take active role in the preparation of EISs.

Land management problems identified by the key informants include unauthorized developments and difficulties in obtaining large tracts of land, especially for industrial and commercial purposes. These problems are the result of the various land tenurial arrangements. In addition to the indigenous land tenure system discussed in Section 4.1.2, two other categories of land ownership in Ashanti were revealed. These are state and "vested" lands. State lands are those lands acquired by the colonial government for its administrative and development functions and held in absolute ownership of successive governments. After independence, the government rezoned many of these lands for residential development, prepared layouts, and allocated them to individuals, corporate bodies, and institutions on long leases for development.

Vested Lands are those previously belonging to a traditional or indigenous authority but declared under various executive instruments and acts to be vested in the state in trust for the

original landowners. The relevant Acts are: the *Administration of Land Act* of 1962; the *State Lands Act* of 1962; the *Public Conveyance Act* of 1965; and the *Constitution of the Republic of Ghana* of 1992. Under the power of these acts, every mineral in its natural state in, under, or upon any land in Ghana, water courses throughout Ghana, the exclusive economic zone, and any area covered by the territorial sea or continental shelf of the country is the property of the Republic of Ghana. All the respondents in this category indicated that they recognize the existence of indigenous institutions in Ghana and the potential of these institutions to resolve some of the constraints to EIA practice in the country.

4.6 Summary

Chapter 4 presented three sets of research findings. These are the result of interviews conducted with: (a) village elders; (b) indigenous healers, hunters and farmers; and (c) government officials, academicians, environmental sector, and nongovernmental organizations respectively. The system of authority and roles, particularly, as they are legitimized in local kinship, clan and family, political, judicial and economic institutions, and other structures entailing direct exercise of authority are discussed. The discussions revealed that the philosophy of life among members of these institutions is built on the perpetuation of life for all objects--both animate and inanimate. Their belief system and environmental management practices are based on this philosophy. The sanctioned aspects of social actions among members of these institutions are permeated by spirituality and reverence for ancestors.

The discussions also revealed a body of indigenous knowledge in the study area. This includes: (a) detailed knowledge of the environment, including plants, animals, and natural phenomena; (b) development an use of appropriate technologies for primary resource utilization, uses of biotic materials, and environmental conservation practices; and, (c) cultural practices and beliefs, including a holistic worldview that parallels the scientific discipline of ecology. These aspects of indigenous knowledge and practices could complement western scientific data in environmental impact assessment and planning. This is imperative because of the paucity of scientific baseline information in Ghana and considerable interest among government officials and academicians in using indigenous institutions to resolve some of the problems with EIA practice. Chapter 5 discusses further avenues for incorporating indigenous systems in environmental impact assessment and planning.

Chapter Five

DISCUSSION OF FINDINGS

5.0 Introduction

The preceding discussions provided some insight pertaining to the potential contribution of indigenous institutions to environmental impact assessment and planning. Chapter 5 discusses aspects of indigenous institutions that are relevant to assessment and planning in Ghana. It also discusses the potential constraints and suggests possible approaches to incorporating indigenous systems to complement scientific knowledge system in ways that would not necessarily dilute the essence of either system nor invalidate their underlying principles. Finally, policy implications of the discussions for Ghana's environmental impact assessment procedure are discussed.

5.1 Potential Contribution of Indigenous Institutions to Environmental Impact Assessment (EIA) and Planning

The key activities within environmental impact assessment process include the following: scoping, impact prediction and significance, mitigation measures, documentation, impact review and monitoring (Beanlands and Duinker, 1983; Ahead and Sammy, 1985; Spalding *et. al.*, 1993).

To recapitulate earlier discussions in Section 2.0, *scoping* refers to the early identification of publicly valued environmental attributes and the setting of temporal and spatial boundaries; *impact prediction* is a projection of future changes in an environment with and without a proposed undertaking; *significance of impacts* depends largely on socially defined norms and values; *mitigation* measures are designed to prevent, minimize or compensate for impacts deemed

significant: and *monitoring* is carried out to observe compliance with mitigation measures, and to detect predicted and unexpected environmental changes. As noted in Section 2.3.1, Ghana's environmental assessment process covers these components including details such as:

- A description of the present environment that would be affected directly or indirectly by the undertaking;
- A prediction of future environmental conditions of the area **with** and **without** the undertaking;
- Proposed measures to prevent or mitigate adverse environmental impacts; and,
- A proposal for environmental management program to cover construction, operation, and decommissioning stages of the undertaking.

The participation of local people and the use of indigenous knowledge could be helpful in this regard. This could also assist planners to identify areas where EIA is mandatory. Such areas include: (a) watershed reserves, wildlife reserves and sanctuaries including sacred groves; (b) potential tourist areas such as historic, archaeological and cultural sites; (c) habitats of endangered or threatened species and indigenous wildlife; (d) areas proned to natural disaster and bush or forest fires. Specifically, indigenous institutions could facilitate environmental assessment in the following ways:

- Identifying social and power structures and avenues for public participation in indigenous communities;
- Using key indigenous leaders and their gongs and village criers to disseminate information and facilitate dialogue;
- Identifying sacred and non-farming days for community meetings and consultations;

- Contributing indigenous experiential or ecological knowledge of past and current behaviour of ecosystems including potential use of local plants and forest products;
- Identifying endangered plant and animal species;
- Explaining local resource-use and nuances including indigenous economic bases;
- Using local value sets to interpret and evaluate the significance of predicted impacts;
- Resolving land use conflicts at the family, community, and village levels based on dialogue and mutual learning processes;
- Using knowledge of the indigenous land tenure system to resolve land claims and compensation where necessary.

As a result of the fundamental similarities and logical links between environmental assessment and planning, these aspects of indigenous institutions could serve a similar purpose in development planning. For instance, in the Canadian Northern Territories, the Lancaster Sound Proposed Regional Land Use Planning Commission (1989) used indigenous knowledge to identify community concerns and to document and map natural resources and cultural features of the Region.

In the past, both environmental assessment and planning were generally considered as largely a technical realm. The identification and evaluation of impacts was thought to be a job for experts or scientists, and the inclination of governments introducing assessment requirements was to rely on experts within government (Gibson, 1990). Certainly, the role of scientists or experts remains important but the record has been that environmental assessment questions can seldom be answered simply through the provision of technical facts (Gibson, 1990; Richardson et. al., 1993). This is particularly true because the scientific methods for predicting environmental

impacts thrive on the implicit assumptions outlined by Lawrence (1992) as follows:

- Aspects of the environment and their relationships can be identified, described or measured and monitored;
- Changes with or without a proposed action can be predicted to the extent that cause and effect relationships can be established;
- Stakeholders' values can be determined;
- Measures of impact magnitude and significance can be assessed; and,
- Issues of probability and uncertainty can be managed to such an extent that it is possible to decide whether a proposed action should proceed with or without modifications.

These assumptions thrive on perfect functioning or ideal models (Rees, 1988). In reality, we do not have such models to make accurate predictions. This seems to be the case in both developed and developing countries. Berkes (1988) reveals how an EIA on the James Bay Hydroelectric Mega-project failed to predict the major impact of the project on native peoples in the La Grande River watershed. The EIA dwelt on scientific predictions and failed to utilize local resource-use, nuances, and local value sets to interpret and evaluate predicted impacts (Meredith, 1991).

The involvement of native people during the impact assessment study for the Beaufort Sea Hydrocarbon Production and Transportation, the Oldman River Dam, and the Norman Wells Oil Field Development and Pipeline projects in Canada revealed useful baseline and monitoring information for environmental assessment. Lalonde (1993) provides a list of native people's concerns that were revealed during consultations in their communities. They include:

- Comments that ancestors never mentioned moose being as far north as Davis inlet, where in the last few years, moose are commonly seen;
- Observation that fox and mink eat their young ones when airplanes fly over them at low levels. Also, flying over caribou calving grounds at low altitude creates stress among females calving; and,
- Concern that past recreational and traditional activities around irrigation weir ceased because of the apparent danger of drowning from new whirlpools and increased flow of rivers.

These information could not have been uncovered using only scientific methods (Lalonde, 1993). In this sense, the involvement of indigenous people in environmental assessment is crucial not only to balance the apparent bias of proponents and ensure less inhibited critical reviews, but also to help reveal and evaluate the non-technical choices that underlie much of the decision-making on environmentally significant undertakings (Gibson, 1990). Examples in Ghana are not far-fetched.

The failure to actively involve indigenous institutions and other stakeholders in the planning and construction of the Tema Harbour in Ghana resulted in many unpleasant experiences. The project involved not only the construction of a seaport but also a resettlement of 12,000 people living in the old Tema and the transplanting of over 200 communal and family gods (Amarteifio *et. al.*, 1966). Many of the gods were buried in the ground and project officers had no idea about the appropriate rituals required for their removal. Dissatisfied with the project, local residents vehemently resisted resettlement for seven years, having sworn to their great god *(Awudu)* that resettlement could only take place "over their dead bodies". The hostility resulted in violent acts, including the destruction of prototype houses by a section of the people to demonstrate their

indignation, until steps were taken to involve the local people and to understand their value sets, resource-use and nuances. For instance, the indigenous judicial system was helpful in resolving land claims and compensation issues (Amarteifio *et. al.*, 1966). The United States Information Agency (USIA) has recognized the potential of indigenous institutions and processes in this regard. It is currently funding a program to integrate the strengths of African indigenous institutions and western methods of conflict resolution to stem the tide of violent civil strife and environmental degradation in Africa (Davenport, 1995).

Another example from Ghana is the Volta Resettlement Scheme in the early 1960's. Project officials regrouped several isolated villages at a new site to take advantage of common public facilities despite differences in the groups' kinship background, power structures, and value-sets. This created animosity and lack of social cohesion among settlers (Chambers, 1970). As if that was not enough, the design and construction of new housing units for the settlers imposed building standards with little or no regard to the socio-economic circumstances of the settlers. The standards were financially and culturally impossible to maintain (Chambers, 1970). For instance, core-housing units were provided using such modern and relatively high cost materials as cement for walls instead of mud or swish; and aluminium roofing material instead of thatch roofing. Later events proved that active involvement of the settlers in the planning and implementation of the project could have averted the costly 'experiments'.

As noted in Section 4.5, the pressing constraint to EIA practice in Ghana is lack of organized baseline scientific data. The availability of baseline data including past and current behaviour of

local ecosystems is fundamental to environmental assessment (Johannes, 1993). Indigenous ecological knowledge is invaluable in this sense. As noted earlier, this knowledge takes the form of an intimate and detailed knowledge of the environment, including plants, animals, and natural phenomena; the development and use of appropriate technologies for primary resource utilization; and a holistic world view that parallels the scientific discipline of ecology (Bourque *et. al.*, 1992). In this sense, indigenous institutions in Ghana have a unique strength to contribute to EIA studies in the country.

The survey revealed diverse ecological knowledge among indigenous institutions in Ashanti. The healers use more than 50 different plant species to treat a variety of diseases. The farmers have a thorough knowledge of the vegetation, crops, soil, and precursors to micro-climatic conditions. The farmers are familiar with biophysical conditions in their communities and they relate their farming activities to these conditions. They are able to control crop diseases on their farms using indigenous methods. They use forest products for most of their basic necessities of life including chewsticks for cleaning their teeth.

Similarly, the hunters have expert knowledge of the habitat of certain plants and animal species. The type of traps used are based on detailed experiential knowledge of the feeding ecology and behaviour of the species sought. The hunters are also familiar with other elements of the local environment such as the location and timing of a host of biological events unknown to scientists. The hunters also told stories about the life cycle of certain animals that they often hunt including the kinds of food they eat, methods of searching for food, pregnancy and gestation

period, natural habitat and average lifespan. The validity of indigenous ecological knowledge rests largely upon the authority of hard-won personal experience (Knudtson and Suzuki, 1992). These knowledge systems may effectively complement scientific data for impact prediction, mitigation, and monitoring.

According to Johnson (1992), the quantity and quality of indigenous ecological knowledge varies among community members, depending upon gender, age, social status, intellectual capability and occupation. This should be taken into consideration in an effort to incorporate indigenous knowledge and practices in environmental assessment and planning processes. With regards to gender, Mishra (1994) argues that in rural economies, women are closer to nature because of the gender-based division of labour and their role in attending to the everyday needs of the household. Evidence from southwestern Mali, Africa, shows that women and men not only possess knowledge about different things; they also possess different knowledge about similar things (Norem et. al., 1989; Simpson, 1994).

Although a detailed investigation of this observation was beyond the scope of this study, the field survey revealed that women and teenagers are chief repositories of current knowledge about the use of trees for fuelwood and other forest products. They have experiential knowledge about the use of trees and forest products as food. Women and teenagers are familiar with the seasonal variation in the availability of forest products for household consumption. They also fetch water daily from streams for domestic uses and are often among the first to notice water pollution. Brooms are made from the ribs of oil palm fronds and are mostly made by women and teenagers.

Similarly, soaps are made from plantain peels or cocoa pods and palm oil mostly by women. Baskets are made from the branches of palm trees by men and teenage boys. Bamboo *(Oxytenanthera abyssinica)* and Odum *(Milicia excelsa)* are used for fencing and house construction mostly by men. Traditional stools or chairs are made from the *Osese (Funtumia sp.)* and *Nyame dua (Alstonia gongensis)* trees and are often made by men and teenage boys. All the traditional birth attendants were women just as the hunting of game is done by men. However, indigenous religious beliefs and practices, as noted in Section 4.1.3, are primarily a communal affair and not based on age, gender, or occupation.

As much as western science has to offer, the knowledge that is most required in environmental assessment and planning is that which will reconnect human beings to the biosphere and its bio-regions in a sense that incorporates respect with implicit socio-cultural, moral, and spiritual expressions (Tyler, 1993). In this sense, indigenous institutions in Ghana have the strengths to contribute to environmental assessment in the country. Their philosophy of life is aimed at the perpetuation of all objects, both animate and inanimate. Their collective environmental wisdom and ethics are expressed through religious beliefs, social norms, and a range of sacred and cultural demands. Their belief that the *Earth* as a deity has a power of its own which could be helpful if propitiated, and harmful if neglected, is a powerful moral sanction against wanton destruction of environmental resources.

Similarly, the constant reminder of the good deeds of the ancestors acts as a spur to good conduct on the part of the living. The belief in the vindictiveness of the souls (*sasa*) of certain

plants and animals contributes towards long term conservation of resources by moderating or limiting the total amount of species that could otherwise be exploited. Also the belief that lesser gods or divinities dwell in such natural resources as lakes, seas, rocks, trees, hills, and certain animals is tantamount to attaching *intrinsic value* to objects. According to Desjardin (1993), many of our environmental concerns rest on the intrinsic value that we recognize in nature. For instance, wilderness areas and scenic landscapes are valued by many people because of their symbolic, aesthetic, or cultural importance.

Other indigenous beliefs and practices discourage resource collapse and allow resources time to recover from exploitive pressures. For instance, as noted earlier, fishing is totally forbidden on certain portions of Lake Bosomtwi and also during the months of July and August when the spirit of the lake is believed to be resting. At *Akyeremade* village, fish from River Bafo is not eaten by inhabitants of the village even though this is not the case downstream and at *Akyeawkrom* near Ejisu, it is a taboo to use water from the *Baduafua* Stream for domestic purposes. A scientific explanation is revealed by Gause (1969) who shows that prey extinction could be effectively avoided by providing an area of the experimental arena inaccessible to the predator where the prey could maintain a minimal population. Perhaps in the case of fishing in Akyeremade village, the experimental arena is River Bafo from which fish is not eaten because of a taboo. Similarly, the experimental arena on Lake Bosomtwi occurs on portions of the lake where fishing is totally forbidden.

Moreover, some of the indigenous restrictions on resource-use parallel scientific prescriptions. For instance, the months of July and August considered as a resting period for Lake *Bosomtwi* in Ashanti is coincidentally the breeding season for fish in the lake. Just as certain methods of fishing, for example the use of boats and canoes, are traditionally forbidden on the lake, there are regulations in developed countries such as Canada and USA that regulate overly efficient fishing gear. Just as indigenous beliefs and taboos protect sacred groves, cemeteries, and forests on river banks, there are scientific prescriptions for keeping forest areas such as national parks and watersheds free from human interference. It is probable that the indigenous taboos and belief systems are based on simple rules-of-thumb that tend to ensure the long term sustainability of a resource base. According to Gadgil and Berkes (1991), rule-of-thumb evolves through a process of trial and error, with the continued acceptance of practices which appear to protect indigenous resource base and the rejection of those that appear otherwise.

Not only do indigenous institutions possess appropriate local ecological knowledge and a philosophy and environmental ethics to keep resource exploitive abilities in check; they also possess technologies that are suitable to the local environment. For instance, many of the indigenous environmental risk-minimizing strategies such as slash-and-burn method of farming, intercropping, and shifting cultivation which were once regarded as primitive or misguided are now recognized as sophisticated and appropriate to the local environment (Yap, 1988). According to Richards (1985), part of the significance of slash-and-burn method of farming is that it prevents phosphorus deficiency in tropical soils. The burning of slashed vegetation releases oxides of potassium, calcium, magnesium, and phosphorus to the soil to serve as plant nutrients.

Klee (1980) argues that the heat from the burning also destroys weed seeds and pests. The indigenous methods for controlling pest and plant diseases in Ashanti seem healthier than the scientific method of pesticide spraying. This is partly because pesticides are often distributed in unlabelled bottles, stored in close proximity to food, and it is common for vegetables to be eaten soon after spraying. No doubt, after several attempts to modernize agriculture in Africa, scientists have concluded that many of their solutions made the problem worse and that it might be advisable to reassess indigenous management strategies (Richards, 1985).

The Volta Resettlement Scheme in Ghana offers a good example where indigenous risk-minimizing strategies eventually received official recognition after scientific prescriptions had failed to improve the economic base of settlers. As part of the measures to mitigate economic impacts of the Scheme, a program of intensive mechanized agriculture was introduced to replace indigenous farming systems. According to Chambers (1970), mechanized agriculture was expected to raise the income levels of settlers and to enable the resettlement towns to become economically viable communities. Ironically, the program was full-fraught with problems. For instance, imported machinery could not withstand the vagaries of tropical weather and spare parts were not easily available. Also, the closed forest did not permit the use of tractors without substantial damage to the environment. As noted earlier, average farm size in indigenous communities is roughly between 1-3 acres and the use of tractors, where possible, was not necessary. Eventually, the government had to import food to feed the settlers until indigenous farming methods such as slash-and-burn, crop rotation, and intercropping using such simple farm implements as the hoe, axe, and cutlass were reintroduced (Chambers, 1970). Had the indigenous

farmers been fully involved in the project decision making, the costly mechanization experiment could have been averted earlier.

Finally, the issue of land management is central to environmental impact assessment because developments do not occur in a vacuum; they often have spatial implications. According to Kasanga (1988) indigenous land tenure system accounts for 90% of total land holdings in Ghana and this makes it imperative to involve indigenous institutions in a meaningful environmental impact assessment in the country. This may minimize such problems as land litigations and unauthorized developments especially regarding lands held under the indigenous tenurial arrangements.

5.2 Incorporating Relevant Aspects of Indigenous Institutions in EIA and Planning: Opportunities and Constraints

The sustainable use of environmental and land resources stems from a combination of two factors: (1) the possession of appropriate local ecological knowledge and suitable methods or technology to exploit resources and (2) a philosophy and environmental ethic to keep exploitive abilities in check and to provide ground rules by which the relation among humans and the environment are regulated (Sadler and Boothroyd, 1993). In this context, the preceding discussions revealed that indigenous institutions could play a significant role in environmental management and assessment. The challenge, however, is to rethink and re-construct environmental impact assessment and planning procedures in Ghana so they are better adapted to the indigenous resource management practices and systems. This may entail the integration of scientific and indigenous systems of knowledge and environmental management.

Mulvihill (1988) offers some guidance. According to him, the indigenous systems should not attempt to duplicate or reinforce bureaucratic, top-down hierarchical structures. Integration of the two systems need not necessarily dilute the essence of either system, nor should it invalidate the underlying principles of either one. Integration of the two systems could be considered within the context of devolution. Usher (1981) sees devolution taking two forms: (a) the movement of authority and responsibility from a higher to a lower level within an established and intact framework; and, (b) the actual transfer of authority and responsibility from one system to another. An example is the colonial British system of indirect rule in West Africa which not only relied on indigenous institutions as agents for local government administration but also assisted them to develop on their own lines (Crowder, 1976). For instance, as noted in Section 1.6, chiefs were elected as ex-officio members to the colonial legislative assemblies, could levy taxes, and were responsible for the implementation of government programs at the local level.

Although the modern system of government in Ghana is based on western-style democracy, the indigenous political institution of chieftaincy remains untouched and its operation is guaranteed by the country's constitution. Chieftaincy is a much respected, sacred, and time-honoured institution. Every one of the ten administrative regions of the country has a regional house of chief, to which representatives are drawn from about 200 Traditional Councils across the country. From each Regional House of Chiefs, 5 members are elected to sit in a National House of Chiefs. Most of the Chiefs who meet at this level are highly educated and have professional qualifications in such disciplines as Medicine, Law, Planning, and Engineering. Chieftaincy in Ghana is like a parallel system of government and has been described by the

Ghanaian President as a unique example of mutual consent between the indigenous and the modern government. If Ghana's President wishes to put a message across to his people, he is as likely to address the National House of Chiefs as make a television broadcast (The Times, 1997). In this sense, chiefs could serve as a medium of information and a link between indigenous people and government agencies concerned with environmental assessment and planning.

Another approach is the establishment of cooperative management boards at the community level. Examples of this approach abound in Canada. Ghana can learn from the Canadian experience. Basically, a cooperative management board is an institutional arrangement in which formal government agencies with jurisdiction over resources and user groups enter into agreement covering a specific geographic region and spell out:

- A system of rights and obligations for those interested in communal land resource;
- A collection of rules indicating actions that subjects are expected to take under various circumstances; and,
- Procedures for making collective decisions affecting the interests of government actors, user organizations, and individual users (Osherenko, 1988).

A cooperative management (or co-management) involves a partnership between indigenous users and government agencies in which the user groups gain a sense of ownership and responsibility for the system's success; and government provides funding for the operation of the board. Suitable examples in Canada are the Beverly-Kaminuriak Caribou Co-management Board in the North-West Territories and the Co-Management of Beluga Whales in Northern Quebec which have improved communication, learning and understanding between indigenous institutions

and formal agencies (Osherenko, 1988). This strategy is possible in Ghana and most other developing countries. For instance, in Ghana the Department of Forestry could enter into partnerships with local people to manage forest reserves in hinterlands.

Quite often, environmental experts who serve on environmental impact assessment advisory, review, and appeal boards are chosen on the basis of their academic and professional qualifications. Indigenous people, who are recognized as "experts" in their communities by virtue of their extensive knowledge and understanding of the local ecology, value sets, environmental resource use and nuances could serve as partners with scientific experts on these boards. However, the criteria for inviting indigenous experts should include such variables as gender, age, social status, occupation, and possibly linguistic abilities.

Finally, a policy to encourage documentation and use of indigenous ecological knowledge in the form of technical dictionaries, videos, educational materials and training manuals could be helpful in the review, implementation, monitoring, and evaluation of environmental programs. This policy may also be helpful for the purposes of verification and validation of indigenous knowledge, particularly, in relation to their impact on sustainable development (Adunga, 1996). Agrawal (1995) refers to this strategy as *ex situ* conservation and argues that the dynamic nature of indigenous knowledge renders a policy of its documentation vulnerable and ill-suited to changing circumstances. Nevertheless, documentation is necessary because it provides historical records or sequence of events for impact prediction in environmental assessment and planning. Documented indigenous knowledge could be reviewed periodically and up-dated.

Public consultations and community hearings especially during the preparation and review phases of environmental assessment may facilitate the incorporation of indigenous knowledge. Consultations could take the form of roundtable discussions and community hearings such as those held by the Berger Commission on the Mackenzie Valley Pipeline proposal in Canada. At the hearings and discussions, indigenous people were given the opportunity to tell the Commission in their own language and style, what their lives and experience led them to believe the impact of a pipeline and an energy corridor would be (Berger, 1984). This is what Berger (1984:3) observed about the process:

> you may say, what can indigenous people tell the planners and the policy-makers in government and in industry?...Well, the ordinary people who lived in the native communities had a great deal that was worthwhile to say. We discovered what should have been obvious all along--that the judgement of the planner and policy-makers at their desks in Ottawa and Yellowknife might not always be right.

Indigenous people are helpful in identifying priorities for project planning, implementation, and monitoring for impacts in their communities. Everitt (1986) revealed this after reviewing two cases where indigenous people were involved in impact monitoring in the Mackenzie Environmental Monitoring Program and the post-construction monitoring of the Norman Wells Oilfield expansion. However, there are constraints to the incorporation of indigenous systems into planning and environmental assessment processes. They include: the influence of powerful internal and external forces; difficulty in changing entrenched attitudes; higher illiteracy rate among members of indigenous institutions and linguistic barriers; and, lack of systematic records and common measurements.

Historically, indigenous institutions have been manipulated and dominated by powerful endogenous and exogenous forces in varied ways. An example is the erosion of indigenous systems by the assimilation into western culture or the replacement of indigenous institutions by formal government structures. When indigenous institutions lose their power to define rights of access or control over communal property, deterioration of indigenous resources occurs (Gadgil *et al.*, 1993). For instance, the *Green Revolution* has resulted in heavy reliance on inorganic fertilizers for agriculture in certain parts of Ghana. In communities where Christianity has taken a stronghold, the worship of nature is discouraged and traditional beliefs are lost. This is the situation in urban settlements such as *Kumasi* and *Accra* in Ghana, where contact with western culture seems to have subverted indigenous practices. Anderson (1996:26), offers a vivid description of this picture:

> in urban centres like Accra, the people of Ghana have lost their traditional beliefs. They no longer have the same sense of community (as those in the rural areas), and are often preoccupied with making money. The only solution may be to pass an environmental law accompanied by heavy penalties and effective enforcement

There is also skepticism, especially on the part of some government officials and scientists in Ghana, that indigenous institutions and their ecological knowledge systems have been irreversibly eroded by the assimilation of the local people into Western or global consumer culture. There are doubts about the long-term survival of indigenous knowledge and management systems. According to Osherenko (1988), indigenous belief systems, norms, and practices are no longer being passed down to the younger generation. New authority figures such as school teachers, bureaucrats, businessmen, and politicians are gradually eroding the authority and influence of the

leaders of indigenous institutions as well as compliance with previously held social norms.

No doubt, some erosion of the indigenous knowledge system and environmental management practices must have taken place. The good news is that the knowledge system of every culture is involved in a continuous process of change, development, and interaction. Banuri and Apffel-Marglin (1993) argue that indigenous knowledge and environmental management practices advance on the basis of new experiences. Therefore, the fact that indigenous systems have suffered some erosion does not necessarily render them outdated (Howe, 1980; Adugna, 1996). Far from being anachronistic in a contemporary world, indigenous knowledge and humane environmental management practices have much to offer environmental policy makers.

Berkes (1981) attributes much of the the erosion of indigenous knowledge and sustainable resource management practices to commercialization of the subsistence economy. In this sense, incentives to create surplus is perhaps the motivating factor for fishing with chemicals and hunting with fire in indigenous Ashanti communities. This often results in the breakdown of the self-limiting principle of a subsistence operation and the customary laws that regulate the relationship between indigenous people and their natural environment. For instance, in a desperate attempt to increase fishing output in certain parts of Ghana, some indigenous people "ignorantly" resort to the use of poisonous chemicals such as *karate* and *gammalin 20* (EPA, 1995). Dyasi (1985) cites an example from a village in the Brong Ahafo Region of Ghana. By damming a river temporarily and applying the insecticide upstream, the villagers poisoned the fish sufficiently to disable them and scoop them easily as they float half-alive on the surface. The

poisoned fish are eaten by humans despite the ill-effects. According to Dyasi (1985) a collaborative effort by a voluntary organization, government officials and indigenous leaders has significantly reduced the incidence of pesticide fishing in the village. First, local health and law enforcement officers explained medical and legal consequences of fishing with poison; second, a traditional priest declared it a taboo to use insecticide for fishing; third, local drama groups performed plays depicting the ill effects of insecticides and selfishness of a fisherman who uses it; and finally, villagers were encouraged to form surveillance groups against fishing with chemicals (Dyasi, 1985). Another example of environmentally degrading resource exploitation involves setting fire to the forest by teenage hunters to flush out game and this often results in uncontrolled bush fires.

Another constraint occurs where claims about the environmental management potentials of indigenous institutions and their ecological knowledge have been so romantic and uncritical that they have provoked a backlash from scientists (Johannes, 1993). The backlash often dwells on isolated cases of environmentally degrading resource management practices among indigenous people such as those noted above.

Furthermore, ignorance and linguistic barriers pose a threat to incorporation of indigenous systems in environmental impact assessment and management. The objective of public hearing and consultations in the environmental impact assessment process is to provide an opportunity for a dynamic exchange of views leading to conclusions that make it possible to improve, accept, or reject a proposal that constitutes a threat to the quality of life and the environment (Richardson

et. al., 1993). Unfortunately, ignorance and linguistic barriers makes it difficult for them to participate effectively in hearings conducted in the English language. Yet, the process of simplifying issues or translating scientific jargon for lay understanding is often full-fraught with problems. For instance, in addressing chlorine bleaching and native people's fear of dioxin at an EIA hearing in Athabasca, Fenner (cited in Richardson *et. al.*, 1993) made toxic dioxin appear harmless by comparing chlorine and caustic soda to the action of ordinary table salt in water. Obviously, this is tantamount to deception.

Another constraint relates to the site-specific nature of indigenous systems. Niemeijer (1995) identifies three complications resulting from indigenous soil classifications because of the site-specific character. The complications are: (a) the heterogeneity of local soil knowledge as for example where within a single locality, similar soils are referred to by different names; (b) the problem of correlating indigenous and scientific soil types which are often based on different premises; and (c) the outsider's perspective which often dilutes the indigenous perspective. The complications arise because indigenous knowledge exists in a local context, anchored to a particular social group, in a particular setting, and at a particular time (Agrawal, 1995).

Some of the foregoing constraints could be removed through community based action research and intensive public education through the media, national and international conferences to raise awareness of the value of indigenous knowledge, formal education system, and with the help of non-governmental organizations through national and international networking. There are approximately 300 community based non-governmental organizations in Ghana. By their

composition, membership, and orientation, most of these organizations could break linguistic barriers between members of indigenous institutions and government agencies in the area of environmental management (Environmental Protection Council, 1994). In addition, steps could be taken to empower leaders of indigenous institutions and to provide them the means and incentives to participate effectively in environmental education at the local level.

According to Mathias (1995), over the last 10 years the amount of information on indigenous knowledge stored in documents, videos, and manuals has increased. The number of conferences on indigenous knowledge has also increased. International network for indigenous knowledge and development has been established and there are newsletters such as the *Indigenous Knowledge and Development Monitor.* In Ghana, there is a Resource Centre for Indigenous Knowledge at the University of Cape Coast which has links with similar centres all over the world. The Centre for Indigenous Knowledge and Agriculture and Rural Development at Iowa State University, Ame, USA has developed a homepage on the internet for databases on indigenous knowledge and related topics. It is hoped that these efforts would change the negative attitude of planners and policy makers towards the use of indigenous knowledge in environmental assessment and planning. What is needed, especially in developing countries, is improved networking to promote exchange of information on indigenous knowledge and its accessibility to planners.

Educational curriculum and practices in Ghana and many developing countries are based on conceptions of education and science derived from colonial experience. These are often inappropriate to local conditions. If formal education and development are to be meaningfully

linked, the attitudes that shape them must be modified to suit local conditions. The fundamental principles, theories, and concepts of formal education could be made more appealing by linking them to indigenous experiences. Kroma's (1995:15) story from Sierra Leone offers a useful lesson in this regard:

> Munda is a *Mende* child who is having difficulty with English numerology. He counts up to "twenty-nine" and goes to "twenty-ten." His teacher's conclusion is that Munda is stupid, since despite repeated explanations and even punishment, he cannot remember that "twenty-nine" is followed by "thirty."
>
> The fact of the matter is that Munda's native language counts somewhat differently, going from "twenty-nine" to "twenty-ten." So there is a logical explanation for Munda's problem which his teacher is not aware: Munda's learning of English numerology is hampered by a *conceptual interference* akin to *linguistic interference*. If the teacher does not realize this, his efforts will simply frustrate Munda and possibly alienate him from mathematics.

The lesson from this story is that there are many people like Munda in developing countries. There are also many instances where indigenous knowledge and concepts come into direct conflict with western educational concepts. In the case of Munda, if his teacher knew more about the indigenous mathematical knowledge that Munda brought to school, he would be in a better position to teach him (Munda) the kind of mathematical knowledge he (Munda) needed to interact effectively with the indigenous environment. If teachers in developing countries are not trained to recognize and deal effectively with indigenous knowledge, they may neglect it, deny it, or even denigrate it when it appears as part of a school child's responses in formal learning settings (Kroma, 1995).

Notwithstanding the constraints, indigenous institutions may still have a role to play in

environmental impact assessment and planning processes. They have stood the test of time and have managed to keep their histories, cultures and knowledge alive while simultaneously adopting several of the external inputs and ideas (Dyasi 1985). The present study has revealed that elements of the knowledge system, including environmental management practices, still exists and persists in indigenous Ashanti communities. Indigenous institutions have existed before, during, and after colonization though not without some "bruises". Alone or in cooperation with official government apparatus, they have exhibited the capacity to uphold socially acceptable environmental ethics and dignity. They focus attention on what matters to local people and therefore seem to have the potential to become worthy partners in assessment and planning processes in Ghana and other parts of the developing world.

5.3 Implications for Ghana's Environmental Impact Assessment Procedure

According to Ebisemiju (1993), procedural issues in environmental impact assessment relate to questions about who sets the rules, who does the screening and scoping, who assesses impacts and their significance, who reviews the assessment, and the nature of public participation. In this sense, indigenous institutions could play a significant role in Ghana's EIA procedure.

Under Ghana's EIA procedure described in Section 2.3.1, the responsibility for *scoping* lies with a project proponent. This entails commissioning a thorough fact finding and consultations with stakeholders to identify valued ecosystem components and make decisions about study boundaries. The process also requires a thorough understanding of the cultural context and local value sets. In this sense, the experiential knowledge of indigenous people and local leaders could

be extremely helpful.

Next, the responsibility for determining significant impacts of proposed projects at both the screening and review stages of Ghana's EIA procedure lies with the Environmental Protection Agency (EPA). In making its decision, the EPA consults with a cross-sectoral committee of members selected from relevant government agencies. It is recommended that this be expanded to include indigenous people who are recognized as "experts" in their communities by virtue of their extensive knowledge and understanding of the local ecology and value-sets. In addition, the criteria for selecting members of the cross-sectoral reviewing committee should include a requirement for an objective understanding of the affected indigenous community including local resource-use, nuances, value-sets and local experiential knowledge.

Also proponents are required to submit scoping reports which include terms of reference for environmental impact studies. This entails a program of public information and consultation in the locality of a proposed undertaking. The field research revealed that community meetings and information in indigenous communities are effected by using a traditional chief's gong and village crier. Therefore, instead of public notice advertisements in newspapers, the chief's gong could be used to disseminate information about a proposed project and to convene meetings for public consultations at the village level.

The timing of public consultations in indigenous communities is crucial to the success of the

assessment process. To be successful, the timing should not interfere with indigenous economic activities such as farming, healing, or hunting. The field research revealed that each indigenous community has sacred or non-farming days (holidays). These days are often used for communal meetings and social events. Planners and assessment practitioners could schedule public information and consultation activities in indigenous communities to coincide with the sacred days.

In addition, proposed undertakings should accompany the establishment of information offices in local communities so that inhabitants could easily seek clarifications or register their concerns about the potential impacts of a proposed project in the locality. Documentation describing the proposal should be translated into local languages and must be supported with pictures and graphics that describe complex issues. This could be enriched with mobile cinema shows, such as those provided by Ghana's Information Services Department in the early 1960s, to explain the purpose and details of the proposed undertaking to local inhabitants and to seek their inputs.

Based on the outcome of the scoping report, a proponent may be asked to initiate a full-scale environmental impact study. This includes:

- Identification and assessment of alternatives to the undertaking;
- Assessment of environmental impacts (including socio-economic and cultural impacts);
- A prediction of future environmental conditions of the area *with* and *without* the undertaking;
- Mitigation commitments, monitoring and decommissioning plans.

The key problems with these aspects of the EIA process in Ghana are lack of organised scientific data and local experts. Environmental impact assessment practitioners and planners could use indigenous people and their ecological knowledge to supplement the scanty scientific data and experts available in the country for EIA studies. In this sense, indigenous institutions in Ghana have a unique contribution to make to assessment studies in the country. The survey revealed diverse ecological knowledge among these institutions including: (a) knowledge of appropriate methods or technology to exploit local resources; and (b) a philosophy and environmental ethic to keep exploitive abilities in check and to provide ground rules by which the relation among humans and animals are regulated. There are methods which permit the qualitative assessment of an impact based on expert opinions including those of indigenous people. The methods include roundtable discussions and the structured Delphi technique (Ahmad and Sammy, 1985). These methods entail pooling together, a group whose knowledge represents the state-of-the-art on the question of interest. In this case, a council of elders may have a better understanding of the effect of destroying a sacred grove in an indigenous community than a team of medical practitioners. In other words, expert opinion does not necessarily imply academic qualifications. Indigenous people who are regarded by the local people as "experts" in the areas of interest could be coopted to help in the assessment and prediction of impacts of a proposed project.

Next, to avoid power imbalance between project proponents and the public, including the marginalized, conscious efforts should be made to empower the latter. This is crucial given the general distance between the EIA approval authority (in Accra) and most rural communities in

the countryside. Application of Social Learning (Section 2.2.5) and Empowerment (Section 1.1.5) requires that efforts be made to help participants, especially the marginalized, to develop their skills and increase their personal value and self-esteem and recognition from others that their personal knowledge and experience are valid and useful in planning and assessment processes. This could include decentralization of EIA approval authority to district and regional offices of the Environmental Protection Council. Indigenous people could help themselves by joining mediating structures such as consumer cooperatives and neighbourhood and community organisations. This would increase their ability to influence environmental impact assessment decisions.

As noted in Section 2.3.2, a twenty-one-day public notice of the final EIS report is given by the EPA through newspaper advertisement and postings at appropriate public places as part of the EIA reviewing process. Again, instead of newspaper advertisements which are not accessible to most of the rural population due to illiteracy and other reasons, the chief's gong could be used to disseminate information about the EIA report and to convene meetings to discuss the implications and provide local inputs. The EPA also sends copies of the EIA to the appropriate local authority to be made accessible to stakeholders in the affected locality. If a strong public concern over the proposed undertaking is expressed, the EPA appoints a panel of 3 to 5 persons to hold public hearings and gather more information on the concerns of the public and how best those concerns could be addressed. At least two-thirds of panel members are residents of the geographic area where a proposed project is to be undertaken. Again, it is recommended that the criteria for selecting the panel members should include a requirement for an objective

understanding of the affected indigenous community including local resource-use, nuances, value-sets (Table 5.1).

Table 5.1 Integrating Indigenous Knowledge in Ghana's EIA Process

EIA Activities	Aspect of Indigenous Knowledge
Scoping	Requires knowledge of the cultural context and local value-sets. Need to consult with local people
Screening	Determine significance of impacts based on local value-sets, past & current local ecosystem behaviour
Public Consultations	Consult with local people. Do this on sacred and non-farming days. Empower indigenous or local people.
Preparing EIS Report	Needs ecological data on local ecosystem. Include indigenous knowledge.
Public Notice	Use the chief's gong or crier to disseminate information in rural communities instead of relying on newspaper advertisement.
EIS Review	Final decision requires understanding of local ecosystem & value-sets. Therefore include local "experts".
Appeal & Public Hearing	Final decision requires objective knowledge of local ecosystem and value-sets. Therefore include local "experts".
Monitoring	Based on past & current knowledge of local eco-system. Monitoring is done by EPA's inspectorate division in Accra. Decentralize monitoring to local levels and include indigenous or local people.

Source: Compiled by researcher

In the event that a proponent is dissatisfied with unfavourable decision by the EPA at any stage of the EIA process, she or he can appeal to the minister responsible for the environment. The minister appoints a board to hear the appeal and to take a final decision on the proposed undertaking. Again, it is recommended that the board members should include indigenous people who are recognized by their communities as "experts" on the issue at stake.

Finally, the Inspectorate Department of the EPA is responsible for compliance monitoring, evaluation and enforcement of EIS approval conditions and other provisions of Ghana's EIA Act. This department is highly centralized with office only in Accra, the nation's capital. It is recommended that indigenous or local groups be made part of monitoring group. As noted earlier, local people are closer to the environment at all times and based on their past and current knowledge, they are in the best position to identify priorities for monitoring and to monitor for local effects. Local people ahould also be empowered to require correction of problems found in monitoring.

5.4 Summary

Chapter 5 highlights specific avenues for incorporating indigenous system in environmental impact assessment and planning. There is the need to establish assessment and cooperative management boards that would include representatives of indigenous institutions. Also constraints to the integration of indigenous and Western scientific systems are discussed. One of the key constraints is the rapid and continuing loss of indigenous knowledge, in part due to the spread of global consumer culture and the effects of western education on younger generations.

If indigenous knowledge is to be preserved and passed from generation to generation, it will have to be given recognized status by the institutions of power and influence beyond the community. Young people would have to learn that indigenous knowledge is not just a relic of the past but is something that is important now and will be worth having in the future. To achieve this, education must be geared the transmission from one generation to the next of the accumulated wisdom and knowledge of the society, and the preparation of the young for effective participation in society's maintenance and development. A similar strategy is to incorporate indigenous knowledge in assessment and planning processes. In this sense, environmental impact assessment and planning could become part of the solution to the continued loss of indigenous knowledge by enhancing the participation of indigenous people in environmental and planning decisions.

Chapter 6

SUMMARY AND CONCLUSIONS

6.0 Introduction

Introductory discussions regarding the concept and theories of development revealed that a practical alternative to a wholesale application of western approaches to environmental impact assessment in developing countries is to explore and improve indigenous approaches to environmental conservation. Further discussions revealed the need to incorporate relevant aspects of indigenous institutions in environmental impact assessment and planning. A case study in Ghana revealed indigenous resource management practices that parallel scientific prescriptions. Chapter 6 provides a summary of the key findings that address the research objectives. The chapter also provides conclusions from the study and directions for future research.

6.1 Key Characteristics of Indigenous Institutions in Ashanti Region of Ghana

The study revealed that indigenous institutions in Ashanti are organized on the basis of traditional systems of authority and roles particularly, as they are legitimized in structures such as family, the chieftaincy hierarchy, the village council, and the native court system (Table 6.1). They provide a framework of ideas, guiding principles, and institutional foundation that can serve as entry points in the search for endogenous options and broad-based efforts to solving environmental problems in the developing world. As noted in Section 5.1, the United States Information Agency (USIA) has recognized this and is funding a program to stem the tide of environmental degradation and civil strife in Africa with input from indigenous institutions.

Table 6.1 Summary of Findings--Key Characteristics of Indigenous Institutions in Ashanti Region of Ghana

NATURE OF INDIGENOUS INSTITUTIONS	TYPES IDENTIFIED	KEY CHARACTERISTICS
Social Institutions & Religious Beliefs	Social: Kinship, Clan, family, and Land Tenure Systems	* Network of relationships extending to include the dead, unborn, and totems * Emphasize collective decision-making * Communal ownership of land
	Religious Beliefs: Supreme God, Ancestral, Divinity and Spiritual Worship	* Permeates every aspect of life * Forms the basis of morality * Dictates code of conduct
Political Institutions	Chieftaincy System at the Family, Community, Village, Town, and Paramountcy levels	* Series of hierarchical levels of authority * Custodians of stool lands * Summon community meetings * Decision-making is based on transactive & mutual learning processes
Judicial Institutions	Native Court System at the Family, Community, Village, Town, Paramountcy levels	* Work on a series of hierarchical levels * Settles internal disputes and land litigations * Guided by precedents and wisdom of elders
Economic Institutions	Indigenous healing, farming, and hunting; wood carving; black-smithing; pottery making; *kente* weaving; and palm-wine tapping	* Based on socio-cultural values and belief systems * Possess experiential or ecological knowledge * Appropriate technologies for primary resource utilization * Uphold a holistic view of nature

6.2 Indigenous Beliefs, Social Norms, and Practices Pertaining to Environmental Impact Assessment and Planning

The study identified several indigenous beliefs, social norms, and environmental conservation practices in Ashanti that are relevant to assessment and planning. These are aspects of social actions enshrined in indigenous cosmological patterns and they give rise to culturally acceptable environmental ethics and practices in the indigenous communities. Similar results have been found in Eastern Region of Ghana, notably Krobo area (Amanor, 1991, 1994) and Ayirebi, near Akim Oda (Dei, 1989, 1990, 1992). Examples of the beliefs, social norms, and humane environmental practices identified in the survey are summarized below:

6.2.1 Indigenous Beliefs

- Totems are believed to be relatives and are not killed, eaten, or destroyed by Ashantis
- The Earth is believed to have a power of its own which is helpful if propitiated or appeased, and harmful if neglected
- Land has been handed to the living by their ancestors. The onus is on the living to preserve it and hand it over to their descendants
- Ancestors are believed to be spirits who are constantly observing the behaviour of the living, protecting and rewarding those who act in accordance with societal values and punishing with misfortune those who exhibit deviant behaviours
- Sacred groves are believed to be the abode of the ancestors
- Divinities and spirits are believed to dwell in such natural resources as rivers, lakes, seas, rocks, hills, and certain powerful animals
- Human beings are not the only creatures endowed with souls surviving after death. All living things share this attribute equally with humans
- The souls of certain animal and plant species are vindictive and could interfere in what might otherwise turn out to be a successful life.

6.2.2 Social Norms

- The extended family serves as the primary social unit
- Social life is inextricately linked with nature and religious beliefs and practices
- Indigenous religion is not documented. Rather, it is entrenched in the hearts, minds, oral history, and experience of the people
- There is a high degree of kinship solidarity among indigenous people
- Inheritance of property and succession to office within a family or clan are strictly through the female lineage
- There is respect for age. Elders are respected and recognized for their enormous experience, knowledge, and understanding of the societal values
- There is also a great respect for the Earth
- Land tenure system is based on communal or group ownership
- Ancestors receive constant attention and worship through libation and food sacrifices
- Indigenous or native courts resolve land use conflicts and are often guided by precedents, experiential knowledge, and wisdom of the elders
- Decision-making is based on transactive and mutual learning processes.

6.2.3 Environmental Conservation Practices

The basic philosophy of life in indigenous Ashanti communities is the perpetuation of life for all objects, both inanimate and animate things. This philosophy gives rise to a range of resource-use restraint practices. These include the following circumstances:

- When game is pregnant, nursing young ones, or mating it is not killed by hunters
- A game animal is not killed when it is spotted drinking from a stream (except after it has drunk from the stream)

- Farming activities are suspended on sacred days because it is believed that the forest is resting

- Hunting is suspended during the closed-season (June to September) which is the breeding period of most game

- The harvest of certain species is prohibited eg. totems, trees in sacred groves

- Farming along river banks is a taboo

- The use of simple farm implements such as the hoe, axe, and cutlass minimizes exposure of subsoil to the vagaries of tropical weather

- Trees and animals believed to have vindictive *sasa* (souls) are not exploited by hunters, herbalists, farmers etc. without appropriate rituals

- Intercropping ensures that an entire farm is not devastated in case of disease outbreak. It also ensures constant vegetation cover and minimizes leaching of soil nutrients

- Bush fallowing allows for regrowth of natural vegetation and enrichment of the soil through decomposed organic materials

- Farmers do not remove larger trees, stumps, and roots which are believed to hold the soil together and protect it from erosion

6.2.4 Indigenous Ecological Knowledge Relevant to Environmental Impact Assessment and Planning Processes

The survey revealed that indigenous people in Ashanti still possess ecological knowledge systems that are relevant to environmental impact assessment and planning. These include knowledge of the following:

- Potential use of local plants and forest products (including medicine, farm tools and household needs)
- Soil characteristics
- Precursors of climatic and weather conditions
- Seasons and ecological conditions associated with forest resources
- Pest management
- Life cycle of certain plants and animal species (including their habitat)

6.2.5 Potential Contribution of Indigenous Institutions to Environmental Impact Assessment and Planning

The study revealed that indigenous institutions in the study area can contribute the following to environmental impact assessment and planning:

- Identifying social and power structures in indigenous communities
- Using key indigenous leaders and their *gong* to disseminate information and facilitate dialogue
- Identifying sacred and non-farming days for community meetings and consultations
- Providing indigenous experiential or ecological knowledge of past and current behaviour of ecosystems including potential use of local plants and forest products
- Identifying endangered plant and animal species
- Explaining local resource-use and nuances including indigenous economic bases
- Using local value sets to interpret and evaluate the significance of predicted impacts
- Resolving land use conflicts at the family, community, and village levels based on dialogue and mutual learning processes
- Providing knowledge of the indigenous land tenure system to resolve land claims and compensation where necessary

6.3 Conclusions

The introductory discussions concerning development issues and first and third world differences imply that empowered public participation in environmental assessment is needed not just on matters of specific project design and impact mitigation but also, and probably more importantly, on issues of planning undertakings. A contentious issue is the need to incorporate indigenous knowledge in environmental assessment and planning. Indigenous knowledge not only has the potential to complement western scientific knowledge in a way that would improve assessment

studies and planning but could also encourage local participation and bottom-up approaches to environmental and planning decisions.

The involvement of local people may also help planners to understand local resource-use and nuances, and use local value sets to interpret, evaluate, and monitor the impacts of environment and development planning decisions. Indigenous people are experts in their own right because they have insights regarding living in harmony with the Earth that the technocratic world has lost (Klee, 1980). Their involvement in environmental assessment and planning may directly or indirectly reduce the total dependence of most developing countries on foreign concepts, goals, technology, and expense in terms of the galaxy of outside experts needed for environmental assessment and planning. To the indigenous people, it would signal a movement up the ladder of citizen participation (Arnstein, 1971).

As noted in Figure 2.1 (p.40), Ghana is the only country in Africa with EA Act and procedures. Therefore, if Ghana is able to incorporate relevant aspects of indigenous knowledge and practices in her EIA and planning processes, it would serve as model for the rest of Africa and most probably, other developing countries.

However, there are constraints to a successful integration of indigenous knowledge in environmental assessment and planning. In our societies, the acceptable norms of intellectual development have been rigidly institutionalized and western intellectual ideals of truths are milestones of our narrow path to knowledge. Guided by inflexible norms and unable to overcome

a deeply ingrained and ethnocentric prejudice against other ways of knowing, planners and policy makers have often overlooked indigenous knowledge systems. Another constraint is the rapid loss of indigenous knowledge, worldwide, in part due to the spread of global consumer culture and the effects of western education on both adults and younger generations (Nakashima, 1990). The integration of indigenous knowledge in environmental assessment and planning processes may become part of the solution to the constraints. Theories such as empowerment, environmental justice, transactive, and social learning could help planners in this regard.

This may require structural changes, as well as changes in the attitudes and perceptions of most planners, governments and policy makers in developing countries. This is because developing countries are dominated frequently by top-down decision-making, dictators, centrally planned economic structures, and "powerful" individuals. Moving toward decentralized decision-making, efficient communication, the restoration of participatory democratic institutions and the guarantee of basic human rights would facilitate the incorporation of indigenous knowledge systems in environmental assessment and planning processes (Appiah-Opoku, 1994).

6.4 Directions for Future Research

This study explored the potential contribution of indigenous institutions to environmental assessment and planning. In the course of writing this thesis, several research questions surfaced but were beyond the scope of this study. They pertain to the following issues:

- The extent to which Ghana's local or indigenous communities, at least those in the area surveyed are suffering from or vulnerable to loss of indigenous knowledge;

- The extent to which the current elders' knowledge is being passed onto the next generation;
- The extent to which the research findings are applicable to other regions of Ghana;
- Research on gender-based indigenous knowledge and practices
- While there is a growing number of field studies on indigenous knowledge, the majority of such studies (including this thesis) are descriptive rather than analytical. What is needed in future is in-depth research which not only records but also analyzes indigenous knowledge;
- There is a need for field testing and on-station research to validate indigenous knowledge and technologies; and,
- There is a need for guidelines on how indigenous knowledge could be used by planners, policy makers, environmentalists, and others.

In the early 1980's a group of scholars led by David Brokensha, David Warren, and Robert Chambers came up with the term "indigenous" to replace "traditional" in the designation "traditional knowledge." The purpose was to have a term that reflects the dynamic contributions of any community to problem solving, based on their own perceptions, conceptions, categories, and classification of phenomena. Sixteen years later, the term "indigenous" has its own set of problems and misinterpretations (Warren, 1996). Brokensha (1996), regards those who promote indigenous knowledge as missionaries--people with a mission to convert those who do not accept the value of indigenous knowledge nor its potential contribution to development. This thesis may be considered as a contribution towards this goal. A lot remains to be done and the above-listed suggestions could provide avenues for future research.

Literature Cited

Abroakwa-Ampadu, R. and O. Ampadu-Agyei. (1987). "Environmental Impact Assessment and Environmental Management in Ghana", Paper presented at the Conference on Resource Conservation for Ghana's Sustainable Development, EPC and Forestry Commission. Accra, 28-30 August.

Acquaye, E. (1989). "A study of Institutional/Legal Problems Associated with Land Delivery in Accra," A Final Report for the Accra Planning and Development Program. Prepared for Government of Ghana, UNDP, and UNCHS.

Act 490. (1994). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

Adarkwa, K. (1983). "Spatial analysis of Rural Development Policies in the Upper Region of Ghana," *Rural Africana*, 17, (Fall) 5-18.

Administration of Lands Act. (1962). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

Adugna, G. (1996). "The Dynamics of Knowledge Systems Versus Sustainable Development," *Indigenous Knowledge and Development Monitor*, **4**(2):31-32.

Afrane, S. (1991). "Altruism, Planning Theory, and Human Settlement Development in the Third World," *UBC Planning Papers*, DP 28, University of British Columbia.

Agrawal, A. (1995). "Indigenous and Scientific Knowledge: Some Critical Comments," *Indigenous Knowledge and Development Monitor* 3(3):3-5.

----------. (1995). "Neither Having One's Cake, Nor Eating it: Intellectual Property Rights and Indigenous Knowledge," *Common Property Resource Digest*, December.

Ahiakpor, J.C.W. (1985). "The Success and Failure of Dependency Theory," *International Organization* 39 (3):535-552.

Ahmad, Y.J. and G.K. Sammy. (1985). *Guidelines to Environmental Impact Assessment in Developing Countries*. UNEP, London: Hodder and Stoughton.

Ahn, P.M. (1970). *West African Soils*. London: Oxford University Press

Alinsky, S.D. (1972). *Rules for Radicals*. New York: Vintage Books.

Allotey, J.A. and Y. Amoyaw Osei. (1996). "Developing Local Capability in Environmental Impact Assessment in Ghana." International Association for Impact Assessment, 16th Annual Meeting, Conference Proceedings Vol. 2, June 17-23, 1996, Estoril, Portugal.

Amanor, K.S. (1994). *The New Frontier Farmers Responses to Land Degradation: A West African Study*. Zed Books Ltd., London & New Jersey.

----------. (1991). "Managing the Fallow: Weeding Technology and Environmental Knowledge in the Krobo District of Ghana," *Agriculture and Human Values* Vol. viii No. 1 & 2, Winter-Spring.

Amarteifio, G.W., D.A.P. Butcher, and D. Whitham. (1966). *Tema Manhean: A Study of Resettlement.* Ghana Universities Press, Accra, Ghana.

Ameyaw, S.K. (1987). "The Dynamics of Female Entrepreneurship and Indigenous Food Markets: Case of Techiman Market," *Unpublished Doctoral Thesis*, Waterloo, ON: SURP, University of Waterloo.

Amin. S. (1972). "Underdevelopment and Dependency in Black Africa: Origins and Contemporary Forms," *Journal of Modern African Studies* 10(4):503-524

Amissah, S.B. (1979). Guidelines for the Formulation of Land Policies and Title Registration in Ghana-A Documentation, Land Administration Research Centre, Kumasi, Ghana: University of Science and Technology Press.

Ampadu-Agyei, O. (1988). "Bushfires and Management Policies in Ghana," *Environmentalist* 8(3):221-228.

Anderson, C.H. (1971). *Toward A New Sociology: A Critical View*. Homewood, IL: Dorsey Press.

Anderson, T. (1996). "Ghana: The Nightmare Lagoons," *International Development Research Council (IDRC) Reports*, Ottawa, Canada, January.

Appiah-Opoku, S., and G. Mulamoottil. (1997). "Indigenous Institutions and Environmental Assessment: The Case of Ghana," *Environmental Management* 21(2):159-171

Appiah-Opoku, S. (1994). "Theoretical Orientations of Environmental Assessment in Canada: Application to the Third World," *Environments*, 22[3]:103-110

----------. (1994). "Applying Canada's Environmental Impact Assessment Model to the Third World," *Plan Canada*, Journal of Canadian Institute of Planners, March.

----------. (1992). "Assessing Ghana's Rural Roof-Loan Scheme with Lessons from the Grameen Bank's Model: Implication for The Work Bank's Shelter Rehabilitation Project in Ghana," Unpublished MSc. Thesis, Guelph, Ontario: USRPD, University of Guelph.

Appiah-Opoku, S. (1990). "Growth Control Implications of the Environmental Assessment Act in Ontario-The Case of Regional Municipality of Durham," Unpublished Bachelor's Thesis, Toronto,ON:SURP, Ryerson Polytechnic University.

Apter, D. (1968). *Ghana in Transition.* New York: Macmillan Company.

Aregbeyen, J.B.O. (1996). "Traditional Herbal Medicine for Sustainable Primary Health Care," *Indigenous Knowledge and Development Monitor* 4(2):14-15, August.

Argyris, C., and D.A. Schon. (1975). *Theory in Practice: Increasing Professional Effectiveness.* San Francisco, California: Jossey-Bass Publishers.

Armour, A. (1990). "Integrating Impact Assessment in the Planning Process: from Rhetoric to Reality?" *Impact Assessment Bulletin* 8 [1 and 2]:3-16.

Arnstein, S. (1971). Eight Rungs on the Ladder of Citizen Participation. Pages 69-91 *in* E.S. Cahn and P.A. Barry (eds.), *Citizen Participation: Effecting Community Change.* Praeger, New York.

Assimeng, M. (1981). *Social Structure of Ghana: A Study in Persistence and Change.* Ghana Publishing Corporation, Accra, Ghana.

Atte, O.D. (1992). "Indigenous Local Knowledge as a Key to Local Development: Possibilities, Constraints, and Planning Issues," *Studies in Technology and Social Change*, No. 20, Iowa State University Research Foundation, USA.

Ayittey, G.B.N. (1991). *Indigenous African Institutions.* Ardsley-on-Hudson, New York: Transnational Publishers Inc.

Babbie, E. (1990). *Survey Research Methods.* Belmont, CA: Wadsworth Publishing.

Barimah, K.B., and Nelson, G. (1994). "Empowerment in a Supplementary Food Program in Rural Community in Ghana," *International Quarterly of Community Health Education*, A Journal of Policy and Applied Research, **14**(2):173-190.

Baruni, T., and F. Apffel-Marglin. (1993). *Who will Save the Forest? Knowledge, Power, and Environmental Destruction.* London: Zed Books.

Beanlands, G.E., and N.D. Duinker. (1983). *An Ecological Framework for Environmental Impact Assessment in Canada.* Halifax, NS: Institute for Resource and Environmental Studies, Dalhousie University.

Beazley, M. (1989). MACE: A Theoretical Perspective on Radical Planning. UBC Ph.D Comprehensive Paper.

Berg, B.L. (1989). *Qualitative Research Methods for the Social Sciences*. Boston: Allyn and Bacon.

Berger, T.R. (1984). "Development from the Perspective of Human Ecology," *Environments* 16(3):2-9.

Berkes, F. (1988). "The Intrinsic Difficulty of Predicting Impacts: Lessons from the James Bay Hydro Project," *Environmental Impact Assessment Review* 8:201-250.

Bielawski, E. (1990). "Cross-cultural Epistemology: Cultural Readaptation Through the Pursuit of Knowledge" *in* Proceedings, *Seventh Inuit Studies Conference*. Fairbanks, Alaska, 19-23 August, Inuit Studies Occasional Papers no. 4.

Biswas, A. K. and Qu Geping, K. (1990). *Environmental Impact Assessment for Developing Countries*. London, UK: Tycooly Publishing.

Blomkvist, H. (1989). "Housing and the State in the Third World: Misperceptions and Non-Perceptions in the International Debate," *Scandinavian Housing and Planning Research* 6(3):129-141, August.

Blunt, P. and D.M. Warren. (1996). *Indigenous Organizations and Development*. London, UK: Intermediate Technology Publications.

Boahen, A. (1975). *Ghana: Evolution and Change in the Nineteenth and Twentieth Centuries*. London, UK: Longman.

Bogdan, R.C. and S.K. Biklen. (1992). *Qualitative Research for Education: An Introduction to Theory and Methods*. Boston, Mass: llyn & Bacon.

Bourque, J., J.T. Inglis, and P. LeBlanc. (1992). "A Canadian led International Program on Traditional Knowledge," Unpublished Manuscript. UNESCO/Canada Man and Biosphere Program, Ottawa, Canada.

Briassoulis, H. (1989). "Theoretical Orientations in Environmental Planning: An Enquiry into Alternative Approaches," *Environmental Management* 13(4):381-392

Brokensha, D.W., D.M. Warren, and C. Warner. (1980). *Indigenous Knowledge Systems and Development*. Lanham: University Press of America, Inc.

Brokensha, D. (1986). "Local Management Systems and Sustainability," Paper Prepared for the Annual Meeting of the Society for Economic Anthropology, Riverside, California. 3-4 April.

----------.(1996). "Comments on Article by Arun Agrawal," *Indigenous Knowledge and Development Monitor* 4(1):12-19.

Brookfield, H. C. (1973). *The Pacific in Transition*. New York: St. Martin's Press.

Bryant, C., and L. G. White. (1982). *Managing Development in the Third World*. Boulder. Colorado: Westview Press.

Bulmer, M. (1977). *Sociological Research Methods*. Macmillan Press, London.

Busia, K.A. (1968). *The Position of the Chief in the Modern Political System of Ashanti*. London: Oxford University Press.

Canadian Environmental Assessment Research Centre. (1988). *Evaluating Environmental Impact Assessment: An Action Prospectus*. Hull, Quebec: Ministry of Supplies and Services Canada.

Cashman, K. (1989). "Agricultural Research Centres and Indigenous Knowledge System in a World of Perspective: Where do we go from Here?" *In* D.M. Warren, L.J. Slikkerveer and S.O. Titilola (eds.) *Indigenous Knowledge Systems: Implication for Agriculture and International Development.* Studies in Technology and Social Change No. 11. Ames: Iowa State University, Technology and Social Change Program.

Chambers, R. (1983). Rural Development: Putting the Last First. London, UK: Longman.

Chambers, R. (1970). *The Volta Resettlement Experience*. London, UK: Pall Mall Press.

Chazan, N., R. Mortimer, J. Ravenhill, and D. Rothchild. (1985). *Politics and Society in Contemporary Africa.* Boulder, Colorado: Lynne Rienner Publishers.

Christopher, A.J. (1984). *Colonial Africa*. Totowa, New Jersey: Barnes & Noble.

Clavel, P. (1994). "The Evolution of Advocacy Planning." *Journal of American Planning Association* 60(2):146-149 Spring.

Conlin, S. (1985). Anthropological Advice in a Government Context. *In* R. Grillo and A. Rews (eds.), *Social Anthropology and Development Policy*. London: Tavistock.

Constitution of the Republic of Ghana. (1992). Accra, Ghana: Ghana Publishing Corporation.

Couch, W.J. (1993). *The Canadian Guide to Environmental Assessment Abroad*. Ottawa, Canada: Federal Environmental Assessment Review Office.

Creswell, J.W. (1994). *Research Design: Qualitative and Quantitative Approaches*. London, UK: Sage Publications.

Croll, E., and D. Parkin. (1992). *Bush Base Forest Farm: Culture, Environment and Development*. New York, USA: Routledge Press.

Crowder, M. (1976). *West Africa Under Colonial Rule*. Toronto, Ontario: Hutchinson and Company.

Culhane, P.J., H.P. Friesema, and J.A. Beecher. (1987). *Forecast and Environmental Decision-Making: The Content and Predictive Accuracy of Environmental Impact Statements*. Boulder, Colorado: Westview Press.

Davenport, N.V.Z. (1995). "Using Indigenous Knowledge for Conflict Management in Africa," *Indigenous Knowledge and Development Monitor* **3**(3):27

Dei, G.J.S. (1992). "A Forest Beyond the Trees: Tree Cutting in Rural Ghana," *Human Ecology*, Vol. 20(1):57-87.

----------. (1990). "Indigenous Knowledge and Economic Production: The Food Crop Cultivation, Preservation and Storage Methods of a West African Community," *Ecology of Food and Nutrition* 22:1-20.

----------. (1989). "Hunting and Gathering in a Ghanaian Rainforest Community," *Ecology of Food and Nutrition* 22(3):225-244.

Desjardin J.R. (1993). Environmental Ethics: An Introduction to Environmental Philosophy. Belmont, California: Wadsworth Publishing Company.

Deshler, D. (1996). "External and Local Knowledge: Possibilities for Integration," *Africa Notes Journal*. April: 1-3.

Devereux, S., and J. Hoddinott. (1993). *Fieldwork in Developing Countries*. Boulder, Colorado: Lynne Rienner Publishers.

Dickman, M. (1991). "Failure of An Environmental Impact Assessment to Predict the Impact of Mine Tailings on Canada's Most Northerly Hypersaline lake," *Environmental Impact Assessment Review* 11:171-180.

Dickson, K.B., and G. Benneh. (1977). *A New Geography of Ghana*. Longman Press: London.

Dorvlo, L.K.T. (1980). *Integrated Approach to Rural Development: A Critical Examination of Some Policy Issues Arising from Ghana's Rural Development Programs.* Ho, Ghana: Evangelical Presbyterian Press.

Duinker, P.N., and G.E. Beanlands. (1986)."The Significance of Environmental Impacts: An Exploration of the Concept," *Environmental Management*, 10(1):1-10.

Dorm-Adzobu, C., O. Ampadu-Agyei, and P.G. Veit. (1991). *Religious Beliefs and Environmental Protection: The Malshegu Sacred Grove in Northern Ghana.* Centre Environment. Nairobi: World Resources Institute and Act Press.

Dove, M. R. (1990). *The Real and Imagined Role of Culture in Development: Case Studies from Indonesia.* Honolulu: Hawaii Press.

Drabek, A. G. (1987). "Development Alternatives: the Challenge for NGO's." Supplement to *World Development* Vol. 15.

Duinker, P. (1985). Effects Monitoring in EIA. In V.W. MaClaren and J.R.B. Whitney (eds.). *New Directions in Environmental Impact Assessment: The Canadian Experience.* Toronto, Ontario: Methuen.

Duinker, P. (1989). "Ecological Effects Monitoring in Environmental Impact Assessment: What Can it Accomplish?" *Environmental Management* 13 [6]:797-805.

Durning, A.T. (1993). "Supporting Indigenous Peoples," *In* L. Starke (ed.), *The State of the World.* A Worldwatch Institute Report on Progress Towards a Sustainable Society. New York: Norton and Company.

Dyasi, H.M. (1985). "Culture and the Environment in Ghana," *Environmental Management* 9[2]:97-104.

Ebisemiju, F.S. (1993). "Environmental Impact Assessment: Making it Work in Developing Countries," *Journal of Environmental Management* 38:247-273.

Edmund, S.W. (1981). "Environmental Policy: Bounded Rationality Applied to Unbounded Ecological Problems," *In* D.E. Mann (ed.), *Environmental Policy Formation.* Lexington, MA: Lexington Books.

Environmental Protection Council (EPC). (1990). *Ghana's Environmental Action Plan.* Accra, Ghana: Presbyterian Press.

----------. (1994). Unpublished Annual Report. Accra, Ghana.

Environmental Protection Agency (EPA). (1995). Ghana: Environmental Impact Assessment Procedures. Accra, Ghana.

Ember C.R., and M. Ember. (1990). *Cultural Anthropology*. Englewood Cliffs, New Jersey: Prentice-Hall.

Everitt, R.R. (1986). *Native People and Renewable Resource Management*. Edmonton: Alberta Society of Professional Biologists.

Field, C.F., and B.D. MacGregor. (1987). *Forecasting Techniques for Urban and Regional Planning*. London, UK: Century Hutchinson Ltd.

Fink, E.H. (1990). *Religion, Disease and Healing in Ghana: A Case of Traditional Dormaa Medicine*. Munchen, Germany: Trickster Wissenschaft.

Forester, J. (1989). *Planning in the Face of Power*. Berkeley, California: University of California Press.

Fortlage, C.A. (1990). *Environmental Assessment: A Practical Guide*. Aldershot, England: Gower Publishing Company.

Fortune, M. (1977). "Some Requirements for Effective Planning at Local Levels of Government." *Planning and Administration* 4(1).

Frank, A. G. (1969). *Capitalism and Underdevelopment in Latin America*. New York: Monthly Review Press.

Friedmann, J. (1973). *Retracking America: A Theory of Transactive Planning*. New York, NY: Anchor Press.

Friedmann, J. (1987). *Planning in the Public Domain: From Knowledge to Action*. Princeton, New Jersey: Princeton University Press.

Friedmann, J. (1992). *Empowerment: The Politics of Alternative Development*. Cambridge, Mass.: Blackwell Publishers.

Fréire, P. (1972). *Pedagogy of the Oppressed*. New York, NY: Herder and Herder.

Furtudo. C. (1973). "The Brazilian Model." Social and Economic Studies 22(1):122-131.

Gadgil, M., and F. Berkes. (1991). "Traditional Resource Management System," *Resource Management and Optimization* Vol. 8(3-4):127-141.

Gadgil, M., F. Berkes, and C. Folke. (1993). "Indigenous Knowledge for Biodiversity Conservation," *Ambio* (22):2-3.

Galtung, J. (1980). *The North-South Debate: Technology, Basic Needs and International Economic Order*. New York: Institute for World Peace.

Gardner, J.E. (1989). "Decision-Making for Sustainable Development: Potential in Selected Approaches to Environmental Assessment and Management," *Environmental Impact Assessment Review* (9):337-366.

Gause, G.F. (1969). *The Struggle for Existence*. New York, NY: Hafner.

Gaventa, J. (1981). *Power and Powerlessness. Quiescence and Rebellion in an Appalachian Valley*. Urbana, Illinois: University of Illinois Press.

Geertz, C. (1963). *Agricultural Involution: The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.

Gendzier, I.L. (1985). *Managing Political Change: Social Scientists and the Third World*. Boulder Colorado: Westview Press.

Ghandi, M.K. (1968). *An Autobiography, The Story of My Experiments with Truth*. 8th Edition, Boston, Mass.: Beacon Press.

Giarelli, G. (1996). "Broadening the Debate: The Tharaka Participatory Action Research Project," *Indigenous Knowledge and Development Monitor* 4(2):19-22.

Gibson, R.B. (1990). "Basic Requirements for Environmental Assessment Processes: A Framework for Evaluating Existing and Proposed Legislations," Unpublished paper, Environment and Resource Studies, Faculty of Environmental Studies, U of Waterloo.

----------. (1991). "Lessons of a Legislated Process: Twelve Years of Experience with Ontario's Environmental Assessment Act," Paper Submitted to the Canadian Environmental Law Research Foundation, Toronto.

----------. (1993). "Environmental Assessment Design: Lessons from the Canadian Experience," *The Environmental Professional* 15:12-24.

----------. (1994). "What's in Store: Environmental Assessment and the Environmental Assessment Board at the end of the Millennium," Unpublished Paper, ERS, FES, University of Waterloo, Waterloo, Ontario, Canada.

Glasson, J., R. Therivel, and A. Chadwick. (1994). *Introduction to Environmental Impact Assessment: Principles and Procedures, Process, Practice and Prospects*. London: UCL Press.

Gleeson, B.J., and N.P. Low. (1997). "Justice in and to the Environment: Ethical Uncertainties and Political Practices," *Environment and Planning*, Vol. 29, pages 21-42.

Goodman, R. (1972). *After the Planners*. New York: Random House.

Goulet, D. (1975). *The Cruel Choice: A New Concept in the Theory of Development*. Antheneum: New York.

Graham, Y. (1993). "Not All Glitter: Residents of Village Polluted by Gold Mining Up in Arms," *West Africa Magazine* 3945, 3-9 May:736.

Grossman, L.S. (1984). *Peasants, Subsistence Ecology, and Development in the Highlands of Papua New Guinea*. Princeton: Princeton University Press.

Hardin, G.J., and J. Baden. (1977). *Managing the Commons*. San Francisco: Freeman.

Harold, J.L. (1991). "Empowerment: A Feminist Approach to Understanding and Action," Unpublished MSc.Thesis, USRPD, University of Guelph, Guelph, Ontario, Canada.

Hart, D. (1981). *The Volta River Project: A Case Study of Politics and Technology*. Edinburgh: Edinburgh University Press,

Heskin, A. (1977). "Crisis and Response: An Historical Perspectives of Advocacy," *Urban Planning Program Working Paper*, Los Angeles, CA: University of California, DP 80.

Hettne, B. (1982). *Development Theory and the Third World*. Stockholm, Sweden: Swedish Agency for International development and Cooperation.

Higgott, R.A. (1983). *Political Development Theory: The Contemporary Debate*. London: Croom Helm.

Holling, C.S. (1985). *Adaptive Environmental Impact Assessment and Management*. Chichester: Wiley.

Hosier, R.; P. O'Keefe; B. Wisner; and D. Shaakow. (1982). "Energy Planning in Developing Countries," *Ambio* 11 [4].

Howes, M. (1980). "The Uses of Indigenous Technical Knowledge in Development," *In* D.W. Brokensha, O. Werner and D. M. Warren. (eds.). *Indigenous Knowledge Systems and Development*. Lanham, MD: University Press of America, Inc.

Hudson, B. (1979). "Comparison of Current Planning Theories: Counterparts and Contradictions," *American Planning Association Journal* October:387-406.

Huntington, P.S. (1971). "The Change to Change: Modernization, Development and Politics," *Comparative Politics* 4(3):55-71

International Union for the Conservation of Nature and Natural Resources (IUCN). (1980). World Conservation Strategy. Gland, Switzerland: IUCN.

Imevbore, M. and J.O. Kakonge. (1993). "Constraints on Implementing Environmental Impact Assessments in Africa," *Environmental Impact Assessment Review* Vol. 13, p.299-308.

International Development Research Centre. (1993). "Background to the International Symposium on Indigenous Knowledge and Sustainable Development," *Indigenous Knowledge & Development Monitor* 1(2):2-5.

Jacobs, M. (1991). *The Green Economy, Environment: Sustainable Development and the Politics of the Future*. London: Pluto Press.

Jacobs, P., and B. Sadler. (1993). "Sustainable Development and Environmental Assessment: Perspectives on Planning for a Common Future," A Background Paper Prepared for the Canadian Environmental Assessment Research Council, Hull, Quebec, Canada.

Johannes, R. E. (1978). "Traditional Marine Conservation Methods in Oceania and their Demise," *Annual Review of Ecology and Systematics* **9**:349-364.

----------. (1993). "Integrating Traditional Ecological Knowledge and Management with Environmental Impact Assessment," *In* Inglis, J.T. (ed.) *Traditional Ecological Knowledge: Concepts and Cases*, IDRC, Ottawa: Canada.

Johnson, M. (1992). *Lori: Capturing Traditional Environmental Knowledge*. IDRC, Ottawa, Canada.

Jones, W.O. (1961). "The Food and Agricultural Economies of Tropical Africa: A Summary Review," *Food Research Institute Studies* 2:3-20, Stanford University Press, Stanford.

Kakonge, J.O. (1995). "Traditional African Values and their use in Implementing Agenda 21," *Indigenous Knowledge and Development Monitor* 3(2):19-22.

Kasanga, K.R. (1988). "Land Tenure and the Development Dialogue: The Myth Concerning Communal Land Holding in Ghana," *Occasional paper* 19, Department of Land Economy, University of Cambridge, UK: Ganta Editions.

Keating, M. (1993). *The Earth Summit's Agenda for Change: A Plain Language Version and Other Rio Agreements*. Centre for Our Common Future, Geneva: Switzerland.

Klee, G.A. (1980). *World Systems of Traditional Resource Management*. New York, NY: John Wiley & Sons.

Knudston, P. and D. Suzuki. (1992). *Wisdom of the Elders*. Toronto, Canada: Stoddart Publishing Company.

Kolo, J. (1986). Institutional Design for Community Planning in Nigeria: A Conceptual Model," Unpublished Doctoral Thesis, Waterloo, ON: SURP, University of Waterloo.

Konadu-Agyemang, K.O. (1991). "Reflections on the Absence of Squatter Settlements in West African Cities: The Case of Kumasi, Ghana," *Urban Studies*, vol. 28, 1:139-151.

Korem, A. (1995). "Sacred Groves and Sustainable Agriculture," *The Weekly Spectator Newspaper*, September 2, p.9, Accra, Ghana.

Korten, D.C., and F. Alfonso. (1983). *Bureaucracy and the Poor: Closing the Gap*. West Hartford, Connecticut: Kumarian Press.

Korten, D.C., and R., Klauss. (1984). *People-Centred Development: Contributions toward Theory and Planning Frameworks*. West Hartford, Conn.: Kumarian Press.

Kroma, S. (1995). "Popularizing Science Education in Developing Countries Through Indigenous Knowledge," *Indigenous Knowledge and Development Monitor* 3(3):13-15

Kumar, K. (1987). "Rapid, Low-Cost Data Collection Methods for the Agency for International Development," *A.I.D. Program Design and Evaluation Methodology Report* #10, Washington, D.C., USA.

Lalonde, A. (1993). *The Federal Environmental Assessment Review Process and Traditional Ecological Knowledge*. Environmental Assessment Branch, Ecosystem Sciences and Evaluation Directorate, Ottawa, Canada.

Lancaster Sound Regional Land Use Planning Commission. (1989). The Lancaster Sound Proposed Regional Land Use Plan.

Lansing, S.J., and J.N. Kremer. (1995). "A Socioecological Analysis of Balinese Water Temples." *In* D.M. Warren, L.J. Slikkerveer and D. Brokensha (eds.) *The Cultural Dimension of Development: Indigenous Knowledge Systems*. London: Intermediate Technology Publications.

Lawrence, D.P. (1992). "Planning and Environmental Impact Assessment: Never The Twain Shall Meet?" *Plan Canada*, Journal of Canadian Institute of Planning, July 22-26.

----------. (1994). "The Characteristics and Aims of Environmental Impact Assessment," *Plan Canada*, Journal of Canadian Institute of Planners, March.

Legat, A. (1994). "Participatory Action Research in Rae Lakes, NWT: The Traditional Government Project," *Information North*, The Arctic Institute of North America 20(2):1-4.

Lindblom, C.E. (1979). "Still Muddling, Not Yet Through," *Public Administration Review* 39(6):517-526.

Mair, L. (1967). *New Nations*. Chicago, Illinois: University of Chicago Press.

Mathias, E. (1995). "Framework for Enhancing the use of Indigenous Knowledge," *Indigenous Knowledge and Development Monitor* 3(2):17-18.

Matowanyika, J.Z.Z. (1991). "Indigenous Resource Management and Sustainability in Rural Zimbabwe: An Exploration of Practices and Concepts in Commonlands," Unpublished Doctoral Thesis, Waterloo, Ontario: Department of Geography, Waterloo.

McConnel, S. (1981). *Theories for Planning: An Introduction*. London, UK: Heinemann.

Meredith, T. C. (1992). "Environmental Impact Assessment, Cultural Diversity, and Sustainable Rural Development," *Environmental Impact Assessment Review* 12:125-38.

----------. (1991). "Environmental Impact Assessment and Monitoring," In B. Mitchell (ed). *Resource Management and Development*, Toronto, Ontario: Oxford University Press.

Merriam, S.B. (1988). *Case Study Research in Education: A Qualitative Approach*. San Francisco: Jossey-Bass.

Meyer, B.P., and M. Burayidi. (1991). "Policy Design for Accountability in Economic Development," Paper Presented at the Conference of the Round Table on Management of Social Services, International Institute for Administrative Sciences, Copenhagen, 2-5 July.

Ministry of Health, Ghana. (1994). Traditional Medicine. A Final Draft Report, Accra, Ghana.

Mishra, S. (1994). "Women's Indigenous Knowledge of Forest Management in Orissa (India)," Indigenous Knowledge and Development Monitor 2(3):3-5.

Morah, E.U. (1990). "The Implementation of Public Policy in Developing Countries: A Case Study of Housing in Nigeria's New Capital City of Abuja," Unpublished Doctoral Thesis, Vancouver, BC:School of Community Planning, University of British Columbia.

Moxon, J. (1984). *Volta: Man's Greatest Lake--The Story of Ghana's Akosombo Dam.* London, UK: Andre Deutsch Press Ltd.

Mulvihill, P. (1988). "Integration of the State and Indigenous Systems of Wildlife Management: Problems and Possibilities," Unpublished paper, School of Urban and Regional Planning, Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario, Canada.

Munn, R.E. (1979). *Environmental Impact Assessment: Principles and Procedures.* Second edition. New York, NY: John Wiley.

Murphy, J. T. (1980). *Getting the Facts: A Fieldwork Guide for Evaluators and Policy Analysts.* Santa Monica, California: Goodyear Publishing Company, Inc.

Mwinyimbegu, K.S. (1996). "Research and Training Directed Toward the Conservation of Indigenous Knowledge: The Training of the Local People," *Indigenous Knowledge and Monitor* 4(2):33.

Nakashima, D.J. (1990). *Application of Native Knowledge in EIA: Inuit, Eiders and Hudson Bay Oil.* Hull, Quebec: Canadian Environmental Assessment Research Council.

Netting, R.M. (1986). *Cultural Ecology.* Second Edition. Prospects Heights, Illinois: Waveland Press, Inc.

Niemeijer, D. (1995). "Indigenous Soil Classifications: Complications and Considerations," *Indigenous Knowledge and Monitor* 3(1):20-21.

Norem, R.H., R. Yonder, and Y. Martin. (1989). "Indigenous Agricultural Knowledge: Gender Issues in Third World Agricultural Development," pp.91-100 in D.M. Warren, L.J. Slikkerveer and S.O. Titilola (eds.). *Indigenous Knowledge Systems: Implications for Agriculture and International Development.* Ames: Iowa State University.

Nsiah-Gyabaah, K. (1994). *Environmental Degradation and Desertification in Ghana.* Avebury Studies in Green Research, Newcastle upon Tyne: Athenaeum press Ltd.

Nukunya, G.K. (1992). *Tradition and Change in Ghana: An Introduction to Sociology.* Accra, Ghana: Ghana Publishing Corporation.

Ofori S.C. (1991). "Environmental Impact Assessment in Ghana: Current Administration and Procedures--Towards Appropriate Methodology," *Environmentalist* 11(1):45-54.

Ollenu, N.A. (1962). *Customary Land Law in Ghana.* London, UK: Sweet and Maxwell Publishers.

Osafo, S. (1983). "The New Investment Code of Ghana," *Environmental Policy and Law* 10:15-16.

Osherenko, G. (1988). *Sharing Power with Native Users: Co-Management Regimes for Native Wildlife.* Ottawa, Canada: Canadian Arctic Resources Committee.

Owen, D.F. (1973). *Man in Tropical Africa: The Environmental Predicament.* New York, NY: Oxford University.

Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods.* California: Sage Publications.

Pierce, M.A. (1990). "Impact Assessment for International Development," *Environmentalist* **10**(1):69-73.

PNDC Law 116. (1985). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

---- Law 207, (1988). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

Prebisch, R. (1950). "The Economic Development of Latin America and its Principal Problems," *American Journal of Sociology* 32:55-85.

Public Land Conveyance Act. (1965). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

Rappaport, R. (1968). *Pigs for the Ancestors.* New Haven, Connecticut: Yale University Press.

Rattray, R. S. (1959). *Religion and Art in Ashanti.* London, UK: Oxford University Press.

Redclift, M. (1987). *Sustainable Development: Exploring the Contradictions.* London: Methuen.

Rees, W.E. (1988). "A Role for Environmental Assessment in Achieving Sustainable Development," *Environmental Impact Assessment Review* 8:273-291.

Richards, P. (1985). *Indigenous Agricultural Revolution: Ecology and Food Production in Africa.* Boulder, Co: Westview Press.

Richardson, M., J. Sherman, J., and M. Gismondi. (1993). *Winning Back the Words: Confronting Experts in an Environmental Public Hearing.* Toronto, Ontario: Garamond Press,

Robinson, J.; G. Francis; R. Legge; and S. Lerner. (1990). " Defining a Sustainable Society: Values, Principles and Definitions," *Alternatives* Vol. 17 No. 2.

Rolston, J. (1989). *Philosophy Gone Wild.* Buffalo, NY: Prometheus

Rothchild, D., and R.L. Curry. (1978). *Scarcity, Choice and Public Policy in Middle Africa.* Berkeley, California: University of California Press.

Rostow, W.W. (1960). *The Process of Economic Growth.* Oxford, England: Claredon Press.

Rothchild, D. (1991). *Ghana: The Political Economy of Recovery.* Boulder, Colorado: Lynne Rienner Publishers.

Roxborough, I. (1985). *Theories of Underdevelopment.* London, UK: Macmillan Educational Ltd.

Ruthenberg, H. (1980). *Farming Systems in the Tropics.* 3rd Edition. Clarendon Press, Oxford.

Sadler, B. (1993). The Mediation Provisions and Options in Canadian Environmental Assessment. *Environmental Impact Assessment Review,* 13:375-390.

Sadler, B. and P. Boothroyd. (1993). *Traditional Knowledge and Environmental Assessment.* A Manuscript Report Prepared for the Canadian Environmental Assessment Research Council, Ottawa, Canada.

Schatz, C., L.H. McAvoy and D.W. Lime. (1991). Cooperation in Resource Management: A Model Planning Process for Promoting Partnerships Between Resource Managers and Private Service Providers. *Journal of Park and Recreation Administration* 9(4):42-58.

Schein, E. H. (1969). *Process Consultation: Its Role in Organization Development.* Reading, Mass.: Addison-Wesley.

Schulkin, J., and D. Sarokin. (1996). "The Culture of Environmental Decision-Making," *Environmentalist* **16**, 283-289.

Sen, G. (1992). *Indigenous Vision: People of India Attitudes to the Environment.* New Delhi, India: Sage Publications

Shapcott, C. (1987). "Environmental Impact Assessment and Resource Management: Learning From the Process and Practice of Native People," A Manuscript Report Prepared for the Canadian Environmental Assessment Research Council.

Singh, N., and V. Titi. (1995). *Empowerment: Towards Sustainable Development.* Halifax, Canada: Fernwood.

Simpson, B.M. (1994). "Gender and the Social Differentiation of Local Knowledge," *Indigenous Knowledge and Development Monitor* 2(3):21-23.

Smith, T.B. (1985). "Evaluating Development Policies and Programmes in the Third World," *Public Administration and Development* 5[2]:129-144.

Spalding, H., B. Smit, and R. Kreutzwiser. (1993). "Evaluating Environmental Impact Assessment: Approaches, Lessons and Prospects," *Environments* 22(1):63-74.

State Lands Act. (1962). Republic of Ghana. Accra, Ghana: Ghana Publishing Corporation.

Tolba, M.K.; O.A. El-Kholy; E. El-Hinnawi; M.W., Holdgate; D.F., McMichael; and R. E., Munn. (1992). *The World Environment 1972-1992: Two Decades of Challenge*. UNEP, London, UK: Chapman & Hall.

Streeten, P. (1984). "Basic Needs: Some Unsettled Questions." *World Development* 12(9):973-978.

----------. (1997). "The Distinctive Features of a Basic Needs Approach to Development," *Development*, Journal of the Society for International Development Vol. 40:49-56.

Sunkel, O. (1969). "National Development Policy and External Dependence in Latin America," *Journal of Development Studies* 6(1).

The Times. (1997). "Ghana." *Newspaper Supplement* London, UK: Unimedia Ltd.

Todaro, M.P. (1985). *Economic Development in the Third World*. London, UK: Longman.

Toronto Star. (1990). "Ottawa to Review Dam's Environmental Impact," Toronto Daily Newspaper, April 25:A19.

Tyler, M.E. (1993). "Spiritual Stewardship in Aboriginal Resource Management Systems," *Environments* 22(1):1-8.

Uphoff, N. (1986). *Local Institutional Development: An Analytical Source Book with Cases*. West Hartford, CT: Kumarian.

Usher, P.J. (1981). "Sustenance or Recreation? The Future of Native Wildlife Harvesting in Northern Canada," *In* M.M.R. Freeman (ed.) *Proceedings: First International Symposium on Renewable Resources and the Economy of the North*, Association of Canadian Universities for Northern Studies, Ottawa 56-71.

Wanjiku, L.C. (1996). "The Effects of Change in Land tenure and Resource Management on Gender Relations and the Subsequent Changes on Highland Ecosystems: A Case Study of Iruri-Kiamariga Community in Nyeri District, Kenya." Unpublished Ph.D. Thesis, SURP, FES, University of Waterloo.

Warren, D.M., and K. Cashman. (1988). "Indigenous Knowledge for Sustainable Agriculture and Rural Development," Briefing Papers on Key Sustainability Issues in Agricultural Development, Gatekeeper Series # SA10, International Institute for Environment and Development.

Warren, D.M. (1991). "Using Indigenous Knowledge in Agricultural Development," *World Bank Discussion Paper* #127, Washington, D.C.:The World Bank

----------. (1996). "Comments on Article by Arun Agrawal," *Indigenous Knowledge and Development Monitor* 4(1):12-20.

Watterson, G.G. (1963). *Conservation of Nature and Natural Resources in Modern African States.* IUCN publication series #1, Geneva, Switzerland.

Webler, T., H. Kastenholz, and O. Renn. (1995). "Public Participation in Impact Assessment: A Social Learning Perspective," *Environmental Impact Assessment Review* **15**:443-463.

Weiss, E. B. (1990). "In Fairness to Future Generations," *Environment Journal*, 32(3):7-12.

Wexler, T. (1995). "Ore of Ghana: The Gold Industry," *Ghana Review International* No. 009, November 3-9.

Wilken, G.C. (1987). *Good Farmers: Traditional Agricultural Resource Management in Mexico and Central America.* Berkeley: University of California Press.

Wiwa, O. (1996). "How Ken Saro Wiwa died: Owen Tells His Story to New Africa," *New Africa*, November, London, UK.

Wolfe, J.; C. Bechard; P. Cizek; and D. Cole. (1992). "Indigenous and Western Knowledge and Resource Management System," A Report Based on Past and Continuing Research of the Faculty and Graduate Students of USRPD, University of Guelph, Ontario.

World Bank. (1992). *World Development Report (Indicators).* London, UK: Oxford University Press.

World Commission on Environment and Development. (1987). *Our Common Future.* London, UK: Oxford University Press.

Yap, N.T. (1988). *"Participatory Impact Assessment and Monitoring for LDC's: The Role of the Private Consultant,"* A Paper Presented at the Annual Conference of the International Association for Impact Assessment, Brisbane, Australia, July.

--------. (1990). "Round the Peg or Square the Hole?, Populists, Technocrats, and

Environmental Assessment in the Third World," *Impact Assessment Bulletin*, Vol. 8(1-2):69-84.2

APPENDICES

Appendix A: LIST OF UNDERTAKINGS REQUIRING MANDATORY EIS IN GHANA

AGRICULTURE:
- land development for agricultural purposes not less than 40 hectares
- agricultural programs necessitating the resettlement of 20 or more families

AIRPORT:
- construction and enlargement of all airports and airstrips.

DRAINAGE AND IRRIGATION:
- construction of dams and human-made lakes
- drainage of wetland and irrigation schemes

LAND RECLAMATION:
- coastal land reclamation
- dredging of bars and estuaries

FISHERIES:
- construction and expansion of fishing harbours
- land-based aquaculture projects

FORESTRY:
- logging or conversion of forest land to other land uses within the catchment area of reservoirs used for water supply, irrigation or hydro-power generation or in areas adjacent to forests and wildlife reserves
- conversion of wetland for industrial, housing, or agricultural uses

HOUSING:
- human settlement development projects
- housing development

INDUSTRY:
- chemical and petrochemical projects with product capacity of more than 100 tonnes/day
- metallic smelting industries of all sizes
- cement factories with output of more than 10 tonnes per day
- pulp and paper factories

MINING:

- mining lease covering a total land area of 10 hectares
- quarrying of aggregate, limestone, silica, quartzite, sandstone, marble etc within 3-kilometre radius of proposed or existing residential, commercial, or industrial development
- sand dredging

PETROLEUM:

- oil and gas fields development
- construction of off-shore and on-shore pipelines
- construction of oil and gas separation, processing, handling, and storage facilities
- construction of oil refineries
- construction of product depots for the storage of petrol, natural gas or diesel located within 3-kilometres of existing or proposed residential, commercial or industrial area

INFRASTRUCTURE:

- construction of hospitals
- industrial estate development and new towns
- construction of roads, highways, and railways

POWER GENERATION:

- construction of steam generated power stations
- dams and hydro-electric power schemes
- combined cycle power stations
- nuclear-fueled power stations
- election of power line

RESORT AND RECREATIONAL DEVELOPMENT:

- construction of coastal resort facilities or hotels with more than 40 beds
- Hill top resort or hotel development
- tourist or recreational facilities in national parks or on islands

WASTE TREATMENT AND DISPOSAL:

- toxic and hazardous waste
- municipal solid waste
- municipal sewage construction of the following:
  (a) incineration plant
  (b) recovery plant (off-site)
  (c) wastewater treatment plant
  (d) secure landfill facility

(e) storage facility (off-site)
(f) marine outfall
(g) composting plant
(h) waste, recovery and recycling depots

WATER SUPPLY:

- construction of dams impounding reservoirs
- construction of marine outfall
- election of power line

ENVIRONMENTAL POLICY ACTIONS

- wildlife conservation and management
- forest conservation and management
- watershed conservation and management
- commercial exploitation of flora and fauna

Appendix B: EIA Public Notice Advertised in a Ghanaian Newspaper

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) NOTICE

The Environmental Protection Agency (EPA) has received an Environmental Impact Statement (EIS) on a proposed Heap Leach Facility at Induapriem Mine, Tarkwa as required under Act 490, Section 12(1). Copies of the EIS are available at the EPA Head Office, Accra, EPA Western Regional Office, Sekondi and Wassa West District Assembly office. Any Person(s) having an interest or concern relating to the potential environmental impacts of the said project/development/undertaking shall within 21 days from the date of publication of this notice, submit in writing such concerns, etc. to:

The Executive Director
Environmental Protection Agency
P. O. Box Box M. 326
Accra

Telephone No: 6646978 Fax No. 662690
OR
The EPA Regional Officer
Environmental Protection Agency
P. O. Box 304
Sekondi
Western Region

(Sgd)
DR P. C. ACQUAH
EXECUTIVE DIRECTOR

EPA launches publication

By Adwoa Van-Ess

THE Environmental Protection Agency (EPA) has launched the Ghana Environmental Impact Assessment (EIA) procedures, a publication which contains documented procedures for EIA administration.

Environmental Impact Assessment is a management tool for the sustainable utilisation of renewable and natural resources in national development.

The EIA therefore integrates environmental management and economic decisions at the earliest stages of planning a project in order to develop plans to mitigate any adverse impacts.

Dr. Peter C. Acquah, Executive Director of the EPA launched the publication together with the EPA newsletter, *Environews* in Accra at the closing of a workshop for Ghanaian consultants who prepare or intend to undertake EIA's for their clients.

Dr. Acquah said the five day workshop and another which preceded it were used to train over 50 consultants on the various aspects of EIA preparation.

He indicated that the EPA ACT of 1994 mandated the agency "to ensure compliance with any laid down EIA procedures in the planning and execution of development projects including compliance in respect of existing projects"

Consequently, the Executive Director said with the publication, the EPA has made available to the public EIA procedures.

Dr. Acquah observed that EIA reports and statements can now be made available to district assemblies where the undertaking will be carried out, EPA regional offices where projects are to be located and at the EPA head office for the general public to scrutinise.

He said the launching of the EPA newsletter which will be published once every two months is in line with the agency's educational strategy.

Mr E. P. D. Barnes, Director of the Ministry of Environment, Science and Technology who chaired the function said the EPA in its endeavour to put in place actions to achieve sustainable development in the country has developed the EIA procedures.

Public Notice Advertised in a Ghanaian Daily Newspaper (*The Daily Graphic* of September 5. 1995)

Appendix C: Sample of Interview Guides

INDIGENOUS INSTITUTIONS AND ENVIRONMENTAL ASSESSMENT

Interview Guide *(traditional farmers)*

Introduction
Interviews will be conducted with the help of trained research assistants.
Research assistants will be instructed to explain to respondents that the interviews are part of a study by Seth Appiah-Opoku, a PhD student at the University of Waterloo, Canada.

This is neither a government survey nor a profit-oriented project. The information will be aggregated with those from similar interviews with other people and will be used for academic purposes in Mr. Appiah-Opoku's doctoral dissertation at Waterloo. The information collected is **confidential** and **no direct references will be made** to individual names.
A brief summary of the results of the study will be provided to each respondent in appreciation of their involvement in the study.

Environmental assessment involves a systematic analysis of the impacts of policies, programs, and projects, and the way in which negative impacts could be minimized prior to implementation.
(Research assistants should use additional piece of paper to record responses where necessary)

Identification number:..... Location of interview:.....

Date of Interview:.....

Section A

Indigenous ecological knowledge and practices pertaining to environmental conservation and resource management

1. How long have you been practising **farming** as a major occupation?

   [ ] < 5yrs
   [ ] 5 - 10 yrs
   [ ] 11 - 20 yrs
   [ ] 21 - 30 yrs
   [ ] 31 - 40 yrs
   [ ] 41 - 50 yrs
   [ ] > 50yrs

2. In addition to farming do you do hunting?

   [ ] yes [ ] no

3. Do you own your farmland?

[ ] yes [ ] no

Answer the following:

(a) how did you acquire the land for your farming activities

(b) what is the procedure for acquiring land in this community?

(c) if someone else owns the land, what is the tenure arrangement? How often does the owner visit the farm?

4. Which of the following farming methods do you use often and why? ***(check one or more)***

[ ] crop rotation [ ] intercropping
[ ] bush fallowing [ ] crop plantation [ ] other (specify).....

5. What specific farming implements do you use?

6. Are there any changes between your current farming methods and those you used in the past?

[ ] yes [ ] no

If "yes" explain your answer (ie. the change, the reasons for the changes, how and when did occur)

7. What is the current situation regarding soil fertility of your farmland?

What are the indicators you use to determine the following:

(a) poor soil fertility?

(b) fertile soil?

8. How do you maintain the fertility of your soil?

9. (a) Have you ever experienced soil erosion problems on your farm?

[ ] yes [ ] no
(b) what techniques do you use to prevent soil erosion?

10. (a) Have you ever experienced an outbreak of plant disease on your farm?

[ ] yes [ ] no

(b) what techniques do you use to prevent the outbreak of plant disease on your farm?

11. Do you use preserve any of your farm produce?

[ ] yes [ ] no

If "yes" answer the following question:

(a) explain the method(s) you use to preserve your farm produce.

(b) Is/ are the method(s) effective?

[ ] yes [ ] no

If "no" what are the problems with the method(s)?

12. Do you know of any plant(s) or herb(s) on your farm that could be used for medicinal purposes?

[ ] yes [ ] no

If "yes" give specific examples

13. Do any of your children (if any) help you on your farm?

[ ] yes [ ] no

If "no" give reasons:

If "yes" give the following details:

(a) number of children who help you on your farm
(b) males and females
(c) age at which they started helping you on your farm
(d) what kind of farming activities do they perform?

Section B

Social norms, traditional beliefs, environmental conservation and resource management

14. Are there "special" days (or seasons) in the year during which you refrain from working on your farm because of a social norm (eg. traditional belief, taboo, festival or ritual)?

[ ] yes [ ] no

If "yes" answer the following questions:

SOCIAL NORM	REASONS OR SIGNIFICANCE	WHEN	HOW IS IT ENFORCED ?
traditional belief			
taboo			
festival			
ritual			

15. Are there any restrictions on the use of a natural resource (eg. rivers, lakes, land, forest etc.) on your farm or in your community?

[ ] yes [ ] no

If "yes" give the following details:

16. Do you observe the social norms (eg. indigenous beliefs, taboos, festivals or rituals) in your community?

[ ] yes [ ] no

Give reasons for your answer:

Section C

Indigenous farmers, environmental conservation and resource management

17. Which of the following environmental problems has your community ever experienced *(tick as many as applicable)*?

[ ] drought	[ ] deforestation
[ ] bushfire	[ ] flooding
[ ] waste disposal	[ ] air pollution
[ ] water pollution	[ ] other (specify).....

(b) In what ways can you contribute to the solution of any 3 or more of the environmental problems in your community?

[ ] yes [ ] no

If "yes" in what ways does this Council control or influence your farming practices?

18. Are your farming activities affected by the land tenure system in your community?

[ ] yes [ ] no

Explain your answer.

Section D

Socio-economic and demographic characteristics of respondents

19. Sex of respondent
[ ] male
[ ] female

20. Age of respondent

[ ] 11 - 20 yrs	[ ] 21 - 30 yrs
[ ] 31 - 40	[ ] 41 - 50
[ ] 51 - 60	[ ] 61 - 70
[ ] >70	

21. Educational status

[ ] no formal education	[ ] elementary
[ ] secondary	[ ] tertiary/Post secondary

INDIGENOUS INSTITUTIONS AND ENVIRONMENTAL ASSESSMENT

Interview Guide ***(traditional healers)***

Introduction

Interviews will be conducted with the help of trained research assistants.
Research assistants will be instructed to explain to respondents that the interviews are part of a study by Seth Appiah-Opoku, a PhD student at the University of Waterloo, Canada.

This is neither a government survey nor a profit-oriented project. The information will be aggregated with those from similar interviews with other people and will be used for academic purposes in Mr. Appiah-Opoku's doctoral dissertation at Waterloo. The information collected is **confidential** and **no direct references will be made** to individual names. A brief summary of the results of the study will be provided to each respondent in appreciation of their involvement in the study.

Environmental assessment involves a systematic analysis of the potential environmental impacts of policies, programs, and projects, and the way in which those effects can be minimized prior to implementation. *(Research assistants should use additional piece of paper to record responses where necessary)*

Identification number:..... Location of interview:.....

Date of Interview:.....

Section A

Indigenous ecological knowledge and practices pertaining to environmental conservation and resource management

1. How long have you been a **traditional healer**?

[ ] < 5yrs
[ ] 5 - 10 yrs
[ ] 11 - 20 yrs
[ ] 21 - 30 yrs
[ ] 31 - 40 yrs
[ ] 41 - 50 yrs
[ ] > 50yrs

2. Type of healer:*(check one or more)*

[ ] fetish priest/priestess
[ ] herbalist
[ ] traditional birth attendant
[ ] cultish
[ ] bone setters
[ ] other (specify)

3. Where did you receive your training?

4. How many years did you spend in training?

5. Are there any difference(s) between current healing methods and those you used in the past?

[ ] yes [ ] no

If "yes" answer the following questions:

(a) what are the difference(s)

(b) what necessitated the changes?

6. Do you use plant species for your healing practice?

[ ] yes [ ] no

If "yes" answer the following questions:

(a) Which parts of plant species do you use (eg. leaves/herbs, roots, barks, or their secreted products)?

(b) Estimate the number of plant species you use for medicinal purposes?

[ ] <10 [ ] 10 - 20
[ ] 21 - 30 [ ] 31 - 40
[ ] 41 - 50 [ ] >50

(c) Where do you obtain medicinal plants or herbs for your healing practice?

[ ] riversides [ ] seasides
[ ] highlands [ ] forest
[ ] savana zones [ ] backyard herbal garden
[ ] markets [ ] other (specify).....

(d) How far do you often travel in order to obtain medicinal plants or herbs for your practice?

[ ] < 10km [ ] 10 - 20 km
[ ] 21 - 30 km [ ] 31 - 40 km
[ ] 41 - 50 km [ ] 51 - 60 km
[ ] 61 - 70 km [ ] > 70 km

What was the distance involved when you first began practising traditional medicine?

7. Do you use animal species for your healing practice?

[ ] yes [ ] no

If "yes" answer the following questions:

(a) Which kinds of animal species do you use (eg. mammals, reptiles, amphibians etc.)

(b) Estimate the number of animal species you use for medicinal purposes?

[ ] <10 [ ] 10 - 20
[ ] 21 - 30 [ ] 31 - 40
[ ] 41 - 50 [ ] >50

(c) Where do you obtain animal species for your healing practice?

[ ] riversides [ ] seasides
[ ] highlands [ ] forest
[ ] savana zones [ ] backyard garden
[ ] markets [ ] other (specify).....

(d) How far do you often travel in order to obtain animal species for your healing practice?

[ ] < 10km [ ] 10 - 20 km
[ ] 21 - 30 km [ ] 31 - 40 km
[ ] 41 - 50 km [ ] 51 - 60 km
[ ] 61 - 70 km [ ] > 70 km

What was the distance involved when you first began practising traditional healing?

8. Compared with the time you first began practising traditional medicine, do you think it is easier nowadays to obtain the following?

(a) medicinal plant species? [ ] yes [ ] no

If "no" what particular difficulties do you encounter in procuring plant species for your healing practice?

(b) medicinal animal species? [ ] yes [ ] no

If "no" what particular difficulties do you encounter in procuring animal species for your healing practice?

9. (a) How do you preserve your medicine obtained from plant or animal species?

(b) Is the method(s) effective?

10. Are any of your children (if any) helping you in your healing practice?

[ ] yes [ ] no

If "no" give reasons:

If "yes" give the following details:

(a) number of children helping you in your healing practice.
(b) males and females.
(c) age at which they started helping you.
(d) specific healing activities assigned to them.

Section B

Social norms, traditional beliefs, environmental conservation and resource management

11. Are there "special" days (or seasons) in the year during which you refrain from healing activities because of a social norm (eg. traditional belief, taboo, festival or ritual)?

[ ] yes [ ] no

If "yes" give the following details:

SOCIAL NORM	REASONS OR SIGNIFICANCE	WHEN	HOW IS IT ENFORCED ?
traditional belief			
taboo			
festival			
ritual			

12. Are there any restrictions on the use of natural resources (eg. rivers, lakes, land, forest) in your community?

[ ] yes [ ] no

If "yes" give the following details:

13. Do you observe the social norms (eg. indigenous beliefs, taboos, festivals or rituals) in your community?

[ ] yes [ ] no

Give reasons for your answer:

Section C

Linking traditional healers, traditional religious leaders, environmental conservation and resource management

14. Which of the following environmental problems has your community ever experienced *(tick as many as applicable)*?

[ ] drought	[ ] deforestation
[ ] bushfire	[ ] flooding
[ ] waste disposal	[ ] air pollution
[ ] water pollution	[ ] other (specify).....

(b) In what ways can you contribute to the solution of any 3 or more of the environmental problems in your community?

15. Are you aware of the activities of Ghana Psychic and Traditional Healers Association?
[ ] yes [ ] no

If "yes" in what ways does the Association controls or influences your healing practices?

16. Are there any regulations or policies by the government which affect your healing practices?
[ ] yes [ ] no

Explain your answer.

Section D

Socio-economic and demographic characteristics of respondents

17. Sex of respondent

[ ] male [ ] female

18. Age of respondent

[ ] 11 - 20 yrs [ ] 21 - 30 yrs
[ ] 31 - 40 [ ] 41 - 50
[ ] 51 - 60 [ ] 61 - 70
[ ] >70

19. Educational status

[ ] no formal education [ ] elementary
[ ] secondary [ ] tertiary/Post secondary

INDIGENOUS INSTITUTIONS AND ENVIRONMENTAL ASSESSMENT

Interview Guide *(traditional hunters)*

Introduction

Interviews will be conducted with the help of trained research assistants.
Research assistants will be instructed to explain to respondents that the interviews are part of a study by Seth Appiah-Opoku, a PhD student at the University of Waterloo, Canada.

This is neither a government survey nor a profit-oriented project. The information will be aggregated with those from similar interviews with other people and will be used for academic purposes in Mr. Appiah-Opoku's doctoral dissertation at Waterloo. The information collected is **confidential** and **no direct references will be made** to individual names. A brief summary of the results of the study will be provided to each respondent in appreciation of their involvement in the study.

Environmental assessment involves a systematic analysis of the potential environmental impacts of policies, programs, and projects, and the way in which those effects can be minimized prior to implementation. *(Research assistants should use additional piece of paper to record responses where necessary)*

Identification number:..... Location of interview:.....

Date of Interview:.....

Section A

Ecological knowledge and practices pertaining to environmental conservation and resource management

1. How long have you been a **hunter**?

   [ ] < 10 years [ ] 10 - 20 yrs
   [ ] 21 - 30 yrs [ ] 31 - 40 yrs
   [ ] 41 - 50 yrs [ ] >51 yrs

2. Which of the following methods/tools do you use for hunting?

   [ ] set traps [ ] bow and arrows
   [ ] hunting dogs [ ] hunting guns
   [ ] other (specify).....

3. Are there any difference(s) between current hunting methods and those used in the past?

[ ] yes [ ] no

If "yes" what are the difference(s) and what necessitated the changes?

4. (a) What kinds of mammals, birds, reptiles, or fish do you often hunt?

(b) Which of them is your favourite "catch"?

5. Do you think it is easier nowadays to obtain a "catch" compared with the time you first began hunting?

[ ] yes [ ] no

If "no" what particular difficulties do you encounter in obtaining a "catch"?

6. What is the habitat of your favourite "catch" during the following seasons:

(a) rainy season?
(b) dry season?

7. What is the feeding habit of your favourite "catch" in terms of the following:

(a) types of food?
(b) where it looks for food?
(c) where it stores food?
(d) when it looks for food?

8. What is the life cycle of your favourite "catch" in terms of the following:
(a) time of the year when mating occurs?
(b) time of the year when young ones are born?
(c) the usual number of young ones born?
(d) length of nursing period?
(e) indicator(s) or evidence of its territory?
(f) average life-span

9. Are any of your children (if any) learning your art of hunting?
[ ] yes [ ] no

If "yes" give the following details:
(a) number of children learning your art of hunting
(b) males and females

(c) age at which they started learning your art of hunting
(d) specific hunting activities assigned to children

Section B

Social norms, traditional beliefs, environmental conservation and resource management

10. Are there "special" days (or seasons) in the year during which you refrain from hunting because of a social norm (eg. traditional belief, taboo, festival or ritual)?

[ ] yes [ ] no

If "yes" answer the following details:

SOCIAL NORM	REASONS OR SIGNIFICANCE	WHEN	HOW IS IT ENFORCED ?
traditional belief			
taboo			
festival			
ritual			

11. Are there any restrictions on the use of natural resources (eg. rivers, lakes, land, forest) in your community?
[ ] yes [ ] no

If "yes" give the following details:

12. Do you observe the social norms (eg. indigenous beliefs, taboos, festivals or rituals) in your community?

[ ] yes [ ] no
Give reasons for your answer:

13. Are there any indigenous taboos, prohibitions, or rules for hunting in your community with respect to the following:

(a) showing respect for mammals, birds, reptiles, and fish?
[ ] yes [ ] no

If "yes" explain your answer.

(b) limits placed on numbers, sex, and age of mammals, birds, reptiles, or fish?
[ ] yes [ ] no

If "yes" explain your answer.

Section C

Linking traditional hunting, environmental assessment and other institutions

14. Which of the following environmental problems has your community experienced?

[ ] drought	[ ] deforestation
[ ] bushfire	[ ] flooding
[ ] waste disposal	[ ] air pollution
[ ] water pollution	[ ] other (specify).....

15. Are there any regulations or policies by the government which affect your hunting practices?

[ ] yes [ ] no

Explain your answer.

Section D

Socio-economic and demographic characteristics of respondents

16. Sex of respondent

[ ] male [ ] female

17. Age of respondent

[ ] 11 - 20 yrs
[ ] 21 - 30 yrs
[ ] 31 - 40
[ ] 41 - 50
[ ] 51 - 60
[ ] 61 - 70
[ ] >70

18. Educational status

[ ] no formal education
[ ] elementary
[ ] secondary
[ ] tertiary/Post secondary

19. Social status *(check one or more)*

[ ] family head
[ ] elder
[ ] chief/subchief
[ ] other (specify)

INDIGENOUS INSTITUTIONS AND ENVIRONMENTAL ASSESSMENT

Interview Guide ***(key government officials, academicians, environmentalists, & NGO's)***

Introduction

Interviews will be conducted with the help of trained research assistants. The interviews are part of a study by Seth Appiah-Opoku, a PhD candidate at the University of Waterloo, Canada.

This is neither a government survey nor a profit-oriented project. The information will be aggregated with those from similar interviews with other people and will be used for academic purposes in Mr. Appiah-Opoku's doctoral dissertation at Waterloo. The information collected is **confidential** and **no direct references will be made** to individual names. A brief summary of the results of the study will be provided to each respondent in appreciation of their involvement in the study.

Environmental assessment involves a systematic analysis of the potential environmental impacts of policies, programs, and projects, and the way in which those effects can be minimized prior to implementation. *(Research assistants should use additional piece of paper to record responses where necessary)*

Identification number:..... Location of interview:.....

Date of Interview:.....

Section A

Indigenous institutions, environmental assessment and formal institutions

1. What is the current official administration and procedures for environmental assessment in Ghana?

2. What kinds of undertaking are subject to environmental assessment requirements?

3. Do you recognize the existence of indigenous institutions in Ghana?

   [ ] yes [ ] no

   If "yes" give 3 or more examples of indigenous institutions in Ghana.

4. Do you think Ghana is experiencing serious environmental problems?

[ ] yes [ ] no

If "yes" give specific examples. Please rank the 3 most serious environmental problems

Environmental Problems Identified	Ranking

5. Are there any constraints to the EIA and Planning in Ghana?

[ ] yes [ ] no

If "yes" what are some of the constraints?. Please rank the the 3 most serious constraints.

Constraints to EIA and Planning	Ranking

Section B

Socio-economic and demographic characteristics of respondents

6. Sex of respondent

[ ] male [ ] female

7. Age of respondent

[ ] 11 - 20 yrs [ ] 21 - 30 yrs
[ ] 31 - 40 [ ] 41 - 50
[ ] 51 - 60 [ ] 61 - 70
[ ] >70

8. Educational status

[ ] no formal education [ ] elementary
[ ] secondary [ ] tertiary/Post secondary
[ ] other (specify)

9. Occupation/Profession