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EVALUATION OF MANAGEMENT PROGRAMS FOR SUSTAINABLE MANGROVE DEVELOPMENT: THE CASE OF THE PHILIPPINES

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ABSTRACT

This study applies policy evaluation as a technique of resolving inefficiency of management policies and programs in achieving sustainable development of mangroves. It aims to emphasize the interrelationships of socio-economic, ecological, and institutional issues of resource management in planning and decision making. This is achieved through the review of the concept of sustainable development and the characteristics of mangrove ecosystems.

The case of mangrove management of the Philippines is used to test the relevance of policy evaluation in natural resource management. The evaluation is based on a multi-disciplinary perspective of sustainable development which considers the interrelationship of socio-economic, ecological and institutional issues relating to the utilization of natural resources, such as mangroves, for human purposes. A conceptual set of goals for sustainable mangrove development is developed and associated evaluation criteria are derived to analyze the sustainability of mangrove policies and programs. The evaluation of mangrove programs of the Philippines illustrated the view that unless a closer review and examination is made on existing and proposed programs in management of the country's mangrove resources, government efforts which focus on the resource alone will only lead to further degradation of the mangrove ecosystem. The Goal Achievement Matrix (GAM) is used as a framework, within which the impacts of such programs are reviewed. The evaluation concludes with the general recommendation that Philippine mangrove policies and programs for managing mangroves needs to be altered to avoid conflict and disintegration and to achieve more efficient and more holistic approach to their management. Specific socio-economic, ecological and institutional recommendations are made to improve the country's mangrove policies and programs.

The study reinforces efforts to implement the concept of sustainable development in natural resource management, which currently includes little evaluation of the consequences of efforts in achieving intended goals.

The study introduces conceptual goals and criteria which may be used in any tropical country to ensure sustainable development of mangroves. This set of goals and criteria, embracing the interrelationships of socio-economic, ecological and institutional factors, may serve as guide or framework in managing mangroves and other similar ecosystems now and in the future.

The study also emphasizes the usefulness of GAM as a framework for evaluating policies about complex issues of natural resource management. The GAM methodology, which has been traditionally used in ranking alternative programs in the context of urban planning, is shown to be useful in evaluating natural resource management policies and programs. With the introduction of sustainable development criteria into GAM methodology, the evaluation technique not only provides relative ranking of mangrove programs, but indicates how well a particular program achieves the goals of sustainable mangrove development.

It is hoped that resource managers, researchers, and other concerned individuals are motivated to undertake program evaluation more effectively in order to achieve sustainable development of natural resources.

TABLE OF CONTENTS

Title Page	i
Acknowledgement	ii
Abstract	iii
Table of Contents	v
List of Figures	ix
List of Tables	x
List of Appendices	xi
Glossary	xiii
Acronyms	xvi
 Chapter One - Introduction	 1
1.1 Rationale	1
1.2 Statement of Problem and Objectives of the Study	3
1.3 Significance of the Study	17
1.4 Assumptions and Limitations of the Study	18
1.5 Methodology of the Study	19
 Chapter Two - Sustainable Development	 23
2.1 Definitions of Sustainable Development and Sustainability	23
2.2 Principles underlying Sustainable Development	27
2.2.1 Improvement of the Quality of Life	27
2.2.2 Conservation of Earth's Vitality and Integrity	28
2.2.3 Utilization within Carrying Capacity Limits	28
2.2.4 Respect and Care for the Community of Life	29
2.2.5 Changing Personal Attitudes and Practices	31
2.2.6 Enabling Communities to Care for their Own Environment	31
2.2.7 Integration of Development and Conservation	31
2.2.8 Creating a Global Alliance	32
2.3 General Goals for Sustainable Development of Natural Resources	33
 Chapter Three - Mangrove Ecosystems	 36
3.1 Ecology of Mangroves	36
3.1.1 Mangrove Features and Characteristics	36
3.1.2 Mangrove Tree and Shrub Species and Geographical Distribution	38
3.1.3 Mangrove Functions and Uses	38

3.1.4	Mangrove Zonation/Structural Formation	41
3.1.5	Mangrove Productivity	45
3.1.6	Environmental Factors which Maintain Mangrove Ecological Processes	47
3.1.6.1	Suitable Physiography	47
3.1.6.2	Soil Water Salinity	48
3.1.6.3	Tidal Intrusion	48
3.1.6.4	Precipitation in Excess of Evapotranspiration	49
3.1.6.5	River Discharges	49
3.1.6.6	Shelter	50
3.1.6.7	Availability of Allocthonous Sediments	50
3.1.7	Management Implications of the Ecology of Mangroves	50
3.2	Sociology of Mangroves	52
3.2.1	Causes and Consequences of Mangrove Destruction	54
3.2.1.1	Forest Exploitation	54
3.2.1.2	Conversion to Agriculture and Aquaculture	55
3.2.1.3	Salt Pond Construction	57
3.2.1.4	Diversion of Freshwater	58
3.2.1.5	Mining/Mineral Extraction	58
3.2.1.6	Waste Disposal	59
3.2.1.7	Coastal Development	59
3.2.2	Management Implications of the Sociology of Mangroves	60
3.3	Conclusion	61
Chapter Four - Conceptual Set of Goals and Criteria for Sustainable Mangrove Development		62
4.1	Conceptual Set of Goals for Sustainable Mangrove Development	62
4.1.1	Socio-economic Goals	67
4.1.2	Ecological Goals	67
4.1.3	Institutional Goals	67
4.2	Criteria for Sustainable Mangrove Development	69
4.2.1	Socio-economic Criteria	70
4.2.1.1	Alleviation of Poverty	70
4.2.1.2	Enhancement of Equity and Justice in Mangrove Utilization	71
4.2.1.3	Local Participation and Decision Making	72

4.2.2 Ecological Criteria	72
4.2.2.1 Standing Biomass	73
4.2.2.2 Abundance, Diversity, and Composition of Mangrove Species	73
4.2.2.3 Net or Gross Primary Production	74
4.2.2.4 Pathways and Nutrient Cycling	75
4.2.2.5 Retrogression	76
4.2.3 Institutional Criteria	77
4.2.3.1 Respect and Care for the Community of Life	78
4.2.3.2 Environmental Awareness	78
4.2.3.3 Comprehensive Planning System	79
4.2.3.4 Administrative Decentralization	79
4.2.3.5 Strengthening Commitment and Coordination in Mangrove Development	80
4.3 Conclusion	80
Chapter Five - Goal Achievement Matrix and its Application in Mangrove Program Evaluation	82
5.1 Goal Achievement Matrix (GAM)	82
5.1.1 Advantages and Disadvantages of Using GAM	85
5.2 Application of GAM in Evaluating Mangrove Programs	87
5.2.1 Assuming Weights on Criteria for Sustainable Mangrove Development	88
5.2.2 Qualitative Indicators in Measuring Program Impact	89
Chapter Six - Mangrove Policies and Programs in the Philippines and their Evaluation	93
6.1 Mangrove Policies and Programs in the Philippines	93
6.2 Discussion and Evaluation of Mangrove Programs of the Philippines	95
6.2.1 Integrated Social Forestry Program (ISFP)	96
6.2.1.1 Socio-economic Impact of ISFP	97
6.2.1.2 Ecological Impact of ISFP	100
6.2.1.3 Institutional Impact of ISFP	101

6.2.2 Fisheries Sector Program (FSP)	103
6.2.2.1 Socio-economic Impact of FSP	106
6.2.2.2 Ecological Impact of FSP	107
6.2.2.3 Institutional Impact of FSP	107
6.2.3 National Forestation Program/Forest Lease Management Agreement (NFP/FLMA)	108
6.2.3.1 Socio-economic Impact of NFP/FLMA	109
6.2.3.2 Ecological Impact of NFP/FLMA	112
6.2.3.3 Institutional Impact of NFP/FLMA	113
6.2.4 Community Forestry Program	114
6.2.4.1 Socio-economic Impact of CFP	115
6.2.4.2 Ecological Impact of CFP	118
6.2.4.3 Institutional Impact of CFP	118
6.3 Results of GAM Evaluation	119
6.3 Sensitivity Analysis	120
Chapter Seven - Discussion of GAM Evaluation Results and Recommendations	123
7.1 Results of GAM Evaluation	123
7.2 General Observations and Recommendations	125
7.3 Specific Observations and Recommendations	127
7.3.1 Socio-economic	127
7.3.2 Ecological	128
7.3.3 Institutional	128
Chapter Eight - Conclusions and Recommendations of the Study	130
REFERENCES	135

LIST OF FIGURES

Figure 1.1	Map showing the relative locations of mangroves in the Philippines	4
Figure 1.2	Graph showing the increase and decrease of fishponds and mangrove in the Philippines	7
Figure 1.3	Indicative diagram of policy formulation in the Philippines and its problems	11
Figure 1.4	Methodology of the study	21
Figure 2.1	Sustainable development perspective	27
Figure 2.2	Goals for sustainable development of natural resources	34
Figure 3.1	Picture showing mangrove forest	37
Figure 3.2	Picture showing mangrove pneumatophores, stilt roots and adventitious roots	37
Figure 3.3	Geographical zones used to describe distribution of mangrove tree and shrub species	40
Figure 3.4	Indicative diagram showing the zonation or types of mangrove forests	43
Figure 3.5	Detrital food chain within mangrove ecosystem	46
Figure 3.6	General Goals for Mangrove Management	61
Figure 4.1	Planning and management scheme in exploiting coastal resources	68

LIST OF TABLES

Table 1.1	Areal distribution of mangrove forests in the Philippines	5
Table 1.2	Problems and issues of mangrove management in the Philippines	15
Table 3.1	List of mangrove tree and shrub species and their distribution	39
Table 3.2	Mangrove functions and uses	41
Table 3.3	Scale of land use impacts within the mangroves	54
Table 4.1	Criteria for sustainable mangrove development	81
Table 5.1	Goal achievement matrix (GAM)	84
Table 5.2	Summary of GAM evaluation results	86
Table 5.3	Guide in projecting program impacts	92
Table 6.1	Matrix of mangrove policies and programs	95
Table 6.2	GAM evaluation of ISFP	98
Table 6.3	GAM evaluation of FSP	105
Table 6.4	GAM evaluation of NFP/FLMA	110
Table 6.5	GAM evaluation of CFP	116
Table 6.6	Results of GAM evaluation	120
Table 6.7	Management or weighting regimes for sensitivity analysis	121
Table 6.8	Relative ranking of mangrove programs based on sensitivity analysis	122

LIST OF APPENDICES

Appendix 1	Organizational Structure of DENR	141
Appendix 2	ISFP Briefing Kit	142
Appendix 3	DENR Administrative Order No. 15, Series of 1990	146
Appendix 4	FSP Briefing Kit	148
Appendix 5	Mangrove Stewardship Agreement	152
Appendix 6	DENR Memorandum No. 11, Series of 1988	155
Appendix 7	DENR Administrative Order No. 70, Series of 1990	173
Appendix 8	DENR Administrative Order No. 123, Series of 1989	174
Appendix 9	Growth/yield parameters of mangrove forests	179
Appendix 10	Sensitivity Analysis Tables	180
	Appendix Table 6.9 Sensitivity analysis of ISFP by considering higher weights on socio-economic criteria	180
	Appendix Table 6.10 Sensitivity analysis of FSP by considering higher weights on socio-economic criteria	181
	Appendix Table 6.11 Sensitivity analysis of NFP/FLMA by considering higher weights on socio-economic criteria	182
	Appendix Table 6.12 Sensitivity analysis of CFP by considering higher weights on socio-economic criteria	183
	Appendix Table 6.13 Sensitivity analysis of ISFP by considering higher weights on ecological criteria	184
	Appendix Table 6.14 Sensitivity analysis of FSP by considering higher weights on ecological criteria	185
	Appendix Table 6.15 Sensitivity analysis of NFP/FLMA by considering higher weights on ecological criteria	186
	Appendix Table 6.16 Sensitivity analysis of CFP by considering higher weights on ecological criteria	187

Appendix Table 6.17 Sensitivity analysis of ISFP by considering higher weights on institutional criteria	188
Appendix Table 6.18 Sensitivity analysis of FSP by considering higher weights on institutional criteria	189
Appendix Table 6.19 Sensitivity analysis of NFP/FLMA by considering higher weights on institutional criteria	190
Appendix Table 6.20 Sensitivity analysis of CFP by considering higher weights on institutional criteria	191

GLOSSARY

Adventitious root	a mangrove root system which originate from the hypocotyl and later from the stem in an upward sequence, sticking down as rather thick repeatedly branched root finally striking ground and rooting.
Allocthonous sediments	terrestrially-derived sediments carried by river discharges that brings nutrients that are incorporated by plants.
Aquaculture	the management of living aquatic resources to increase production beyond the levels of normally available from harvesting wild stocks.
Aquifer	a water bearing bed or stratum of earth.
Barangay	the village unit form of local government in the Philippines.
Bio-diversity	the variety of life in all its forms, levels and combinations.
Carrying capacity	capacity of an ecosystem to support organisms, while maintaining its productivity, adaptability and capability of renewal.
Cutting cycle	the number of years between major harvest in the same working unit with rotation.
Detritus	particles originating from plant materials that drains into the body of water. They serve as energy budgets of fisheries within mangroves and offshore marine life.
Ecological processes	a continuous action or series of actions that is governed or strongly influenced by one or more ecosystem.
Ecosystem	a system of plants, animals and other living organisms together with the non-living components of their environment.
Edaphic factors	soil related factors that affect the growth of plants (e.g. soil type, soil structure, etc.).
Evapotranspiration	loss of moisture due to evaporation, percolation and run-off.

Facultative halophytes	types of plants that are not restricted to only one function. These are plants that can either tolerate fresh or saline water.
Food chain	a series of organism, each successive group of which feeds on the group immediately previous in the chain, and is in turn eaten by the succeeding group.
Fry fishermen	mangrove dependent communities that only gather milkfish fry or shrimp fry for cash income.
Genetic diversity	the variety and frequency of different genes and/or genetic stocks.
Interstitial salinity	the salinity level of sea water within the interstices.
Laminar water flow	the movement of ground water.
Lease	a privilege granted by the State to a person to occupy and posses, in consideration of a specified rental, in forest land of the public domain in order to undertake any authorize activity therein.
Life-support system	an ecological process that sustain the productivity, adaptability and capacity for renewal of lands, water, and or the biosphere as a whole.
Mangroves or mangrove forests	either the constituent plants of tropical and subtropical intertidal forest communities or the community itself.
Natural resource	biophysical resource that is used directly by people.
Neritic waters	the region of shallow water adjoining the sea cost.
Nipa	an important palm species growing abundantly in mangrove areas.
Over-wash islands	islands form from the accumulation of sediments carried by river discharges and wave action.
Pneumatophores or stilt roots	submerged or exposed roots which function as respiratory organs.
Rehabilitation	to return a degraded ecosystem to an un-degraded condition, which may be different to its original state.
Species diversity	the variety and frequency of different species.

Sustenance fishermen	mangrove dependent communities that gather adult fish or fish fry for consumption.
Tanbark	ground bark materials of mangrove trees being tapped for the extraction of tannin.
Viviparous seedlings	seedlings that germinate within the parent plant before they are shed.

ACRONYMS

ADB	Asian Development Bank
CARL	Comprehensive Agrarian Reform Law
CBA	Cost-Benefit Analysis
CENRO	Community Environment and Natural Resources Officer
CRMC	Coastal Resources Management Committee, DENR
CFP	Community Forestry Program
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DAO	DENR Administrative Order
FLMA	Forest Lease Management Agreement
FSP	Forestry Sector Program
GAM	Goal Achievement Matrix
ISFP	Integrated Social Forestry Program
IUCN	International Union for the Conservation Nature and Natural Resources
MSA	Mangrove Stewardship Agreement
NAMRIA	National Mapping and Resource Information Administration
NFP	National Forestation Program
NGO	Non-governmental Organization
NPCO	National Program Coordinating Office
NRMDP	Natural Resources Management Development Program
OECE	Overseas Economic Cooperation Fund

OM	Organic Matter
PBS	Planning Balance Sheet
PCARRD	Philippine Council for Agriculture and Natural Resources Research and Development
PENRO	Provincial Environment and Natural Resources Officer
PHP	Philippine peso
RED	Regional Executive Director
UPI	United Press International
WB	World Bank
WCED	World Council for Environment and Development