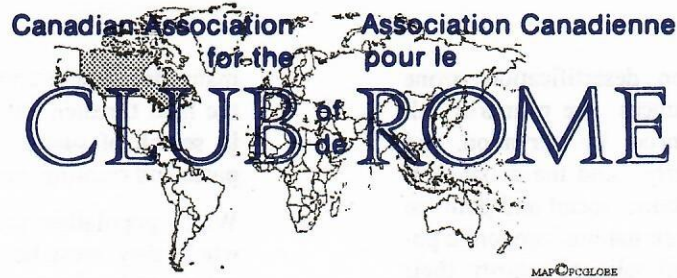


EDITOR
Dr. J. Rennie Whitehead
1368 Chattaway Ave
OTTAWA Ont K1H 7S3
Tel (613) 731-6536



CHAIRMAN
Mr. C.R. (Buzz) Nixon
Box 322, RR NO. 2
OTTAWA Ont K2C 3H1
Tel (613) 825-1555

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Optional Strategies to Address the World Problematique

A Report to the Canadian Association for the Club of Rome
by
the Chairman and Members of Working Group #2

The Working Groups

At the Annual General Meeting of CACOR, on September 18, 1991, it was agreed that three working groups would be established to try to establish means to assist mankind in resolving the dilemma that has been called the World Problematique. The three working groups would have the following broad mandates:

- Working Group #1: To develop a listing of impediments to resolution of the Global Problematique.*
- Working Group #2: To develop options to overcome the impediments identified by Working Group #1*
- Working Group #3: To develop a recommended integrated plan to resolve the Problematique.*

This ambitious strategic plan is intended to possibly form the backbone of future submissions made by the Association to decision-making authorities,

The following is the Report of Group #2. It was researched and developed by W.R. Dobson, E.W. Manning and J. Maini.

PREAMBLE

At the outset our working group decided that we would borrow a line of thought from Harlan Cleveland's book *The Knowledge Executive* in that we need to develop a strategy that is neither so hopeful as to be unrealistic, nor so grim as to invite despair. Opportunism and pessimism are not arguments, they are opposite forms of the same surrender to simplicity. Relieved of the burden of complex options within complex consequences, both optimists and pessimists carry on without caring about the consequences of their actions. Convenience of a single course for the juggernaut of history whether malignant or benign, both optimists and pessimists allow themselves irresponsible actions because they believe that individual actions have no significant influence on events.

INTRODUCTION

1. An analysis of the report produced by the Impediments Working Group reveals a long list of environmental trends which together constitute an increasingly grave challenge to the habitability of the earth. This list of factors could be rearranged to fit into the categories of:
 - Causes
 - Symptoms of the Problem and
 - Consequences of Inaction.
2. In general, the root causes are human (population, consumption trends, new technologies which create new substances and byproducts); the symptoms are

biophysical (e.g. deforestation, desertification, ozone depletion); and the consequences are primarily felt by human systems as evidenced by starvation, and other manifestations of poverty, and the collapse of certain elements of our economic, social and political systems. These trends threaten nations' economic potential, therefore their internal political security, their citizens' health and possibly their very existence. No greater threat to national and international security currently exists. Thus, together with economic interdependence, global environmental threats are shifting traditional western concerns to a focus on collective global action.

3. The global environmental challenge is fundamentally different from previous international concerns, the forty-five years of preoccupation to avoid nuclear war for example hinge on actions by governments. The new challenges rest on the beliefs, morals, ethics, and attitudes of billions of individuals and on the roles played by national and multinational business. The importance of the individual behavioural change and the major new roles to be played by non government institutes will require profound changes in the mechanisms of international cooperation.

POPULATION GROWTH

4. The degradation of the global environment is integrally linked to the overall level of impact or stress on the planet, which is the product of population times consumption patterns (it is clearly a function of our different lifestyle patterns). This would imply that reduced impact on the ecosphere can be obtained by reductions in either or both - a sustainable solution will probably require action on both fronts. Current estimates state that 90 million people are being added every year - more than ever before in history. On its present trajectory, the world population will nearly triple in size, reaching 14 billion before beginning to stabilize. With heroic effort, it could level off at around 9 billion. However today's unmet need for family planning is huge: only 30 percent of the reproductive aged people in the developing world, excluding China, have an understanding about or access to contraception. In many instances, women do not have full and equal participation in society and are not included in societal planning.
5. The total stress on the planet is bound up with poverty. In the Sahel as well as other areas threatened by famine and environmental deterioration, poor people have no other option but to consume all available local resources. Sustaining the environment thus requires balance between wise environmental management, active efforts to control population growth, education and equitable economic development. In

many developing countries, population pressures on the land threaten national security as people migrate in search of sustenance, aggravating territorial disputes and creating violence.

6. While population pressures affect the planet as a whole they must be individually addressed by each nation and its citizens. Countries must make their own assessment about population levels and growth rates, establishing priorities and providing incentives accordingly. Industrialized nations can offer much needed technical support and experience in population planning to help developing nations and individual societies achieve their goals. At the same time the developed nations are concentrating research and investment in the use of artificial life support systems. Somehow there must be a reconciliation before we can expect the underdeveloped nations to accept a curtailment of their growth.
 - Universal access to family planning by the end of the decade.
 - Priority to investment in education on a global basis.
 - Increased research into safer, cheaper and easier birth control technologies.
 - Increased communication aimed at increasing support for family planning.

DEFORESTATION AND LOSS OF BIODIVERSITY

7. Escalating human populations, deforestation, disruptions of watershed, soil loss, and land degradation are all linked in a vicious cycle that perpetuates and deepens poverty, and often creates ecological refugees. Because deforestation and biodiversity losses result first from mismanagement at the local level, effective interventions must also occur at this level, building on local norms, conditions and cultures that will promote sustainable management practices. Recent efforts to restore common-property management by indigenous peoples in the Amazon basin of Columbia and Ecuador are notable initiatives that appear to be effective at low cost. Aside from the obvious, it often overlooked that forests provide: products for shelter, food, fibre, fodder, paper to combat illiteracy; opportunities for economic and industrial development; conserve water and soil and influence ecological cycles (climatic, carbon, oxygen, nutrients) which are significant at the local, regional and international levels. In other words, well managed forests can make pivotal contributions to some of the basic problems facing humanity, particularly in the south. However, the challenge we face is: given expanding population and shrinking forest cover, how are we going to meet the increasing needs? Mobilizing international community expertise and financial re-

sources could go a long way toward achieving this objective.

management practices that are consistent with environmental sustainability.

8. At the national level effective management will require a commitment to conservation, land use planning, secure property rights, and sustainable agroforestry, so that forests provide a continued flow of goods and services with minimum ecological disruption. Timber harvesting must reflect long-term scarcity values consistent with full environmental and social cost accounting. Forests are often sacrificed for a fraction of their real value by nations in search of quick sources of foreign exchange. While "debt-for-nature" swaps by the private sector are helpful and should be expanded, they are unlikely to be sufficient either to save forest ecosystems or to relieve debt loads. However opportunities exist to include government debt in this process and to complement the international debt strategy by linking reduction in public sector debt to policy reforms with environmental benefits.
9. It should be made clear that forested environments are among the most versatile of global ecosystems, and must be managed to provide on a sustainable basis all of the values which they support not just the marketable forest products such as timber and wildlife. Indeed part of the problem may well be in the way we view these environments in our common approaches to national accounting or to resource inventory - focusing only on stocks of commercial products (often ignoring even these in national accounts) and having few tools to address the identification of the other values provided by these ecosystems. While some form of full cost accounting in theory could aid in the identification and protection of the full range of critical values supported by these environments, we do not yet have the tools needed to do this - even at a fairly local level.
 - **While respecting local community property rights that promote ecologically sound practices and management systems, governments can help most by eliminating distorted economic incentives that encourage mismanagement, such as the granting of property titles in return for forest clearing, and below cost timber sales. International institutions should encourage such reforms.**
 - **Forest conservation is not enough, it must be accompanied by aggressive, ecologically sensitive reforestation and land rehabilitation, especially on arid lands and where fuel wood demands are high**
 - **The World Bank in its lending policies should be sensitive to encouraging land use and forest**

ATMOSPHERE AND ENERGY

10. Human activities are substantially changing the chemical composition of the atmosphere in a way that threatens the health, security and survival of the people and other species, and increases the likelihood of international tensions. Depletion of the ozone layer and global warming are two salient examples, but new or unseen effects can not be ruled out.
11. It is estimated that even under the Montreal Protocol, atmospheric concentrations of CF-1 and CF-2 will increase by 77% and 66% respectively in the next half century. This protocol was viewed as landmark achievement, but it is an unfinished story. Full participation by the underdeveloped countries has not yet been achieved. Issues of acceptable alternatives and technological transfer have not been resolved.
12. Due to the rising concentration of greenhouse house gases, other substances and byproducts of our behaviour, the earth is set to experience substantial climate change of unknown scale and rapidity. The consequences are likely to include sea-level rise, greater frequency of extreme weather events, disruption of the ecosystems and potential vast impacts on the global economy. The processes of climate change are currently viewed as irreversible, and major additional releases harmful substances could trigger an uncontrollable self re-enforcing process.
13. Within the context of targeting the 4Rs solutions - Reduce, Replace, Re-use and Recycle to alter our behaviour patterns:
 - **The industrialized nations should work quickly toward a multinational framework involving national targets for reducing harmful emissions. There is no need to await universal agreements, industrialized nations can act individually or in concert with like minded nations;**
 - **Initial steps should be taken involving the deployment of a range of policy instruments to achieve energy conservation and efficiency, demand side management and changes in fuel mix;**
 - **Initiate considerable expansion of support for research and development into alternative energy sources.**

CREATING A MODEL

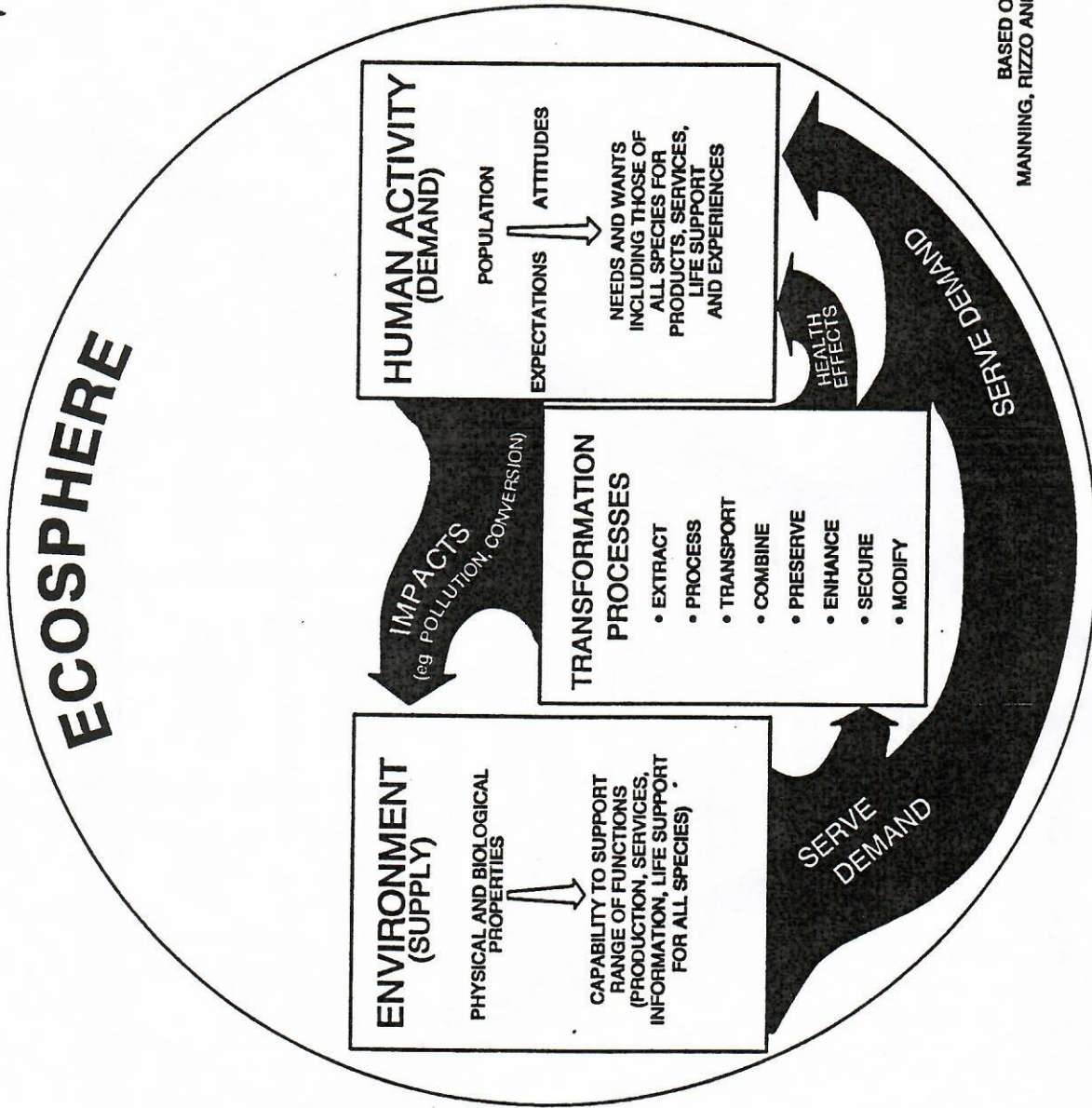
14 To effectively deal with the local and global problematique, to build toward the goal of sustainable development, we will need better information on the existing environment, improved analytical tools, changed institutions, and an altered decision making process which integrates environmental factors routinely into decisions. New models should be based on an altered system of ethics and different attitudes. Any new system will require the recognition that mankind is but one of the many residents on planet earth. The global challenge will involve an holistic approach to ecosystem management at all levels. How we ask the questions influences and limits the answers we seek and the disciplines and approaches we involve. The model put forward at figure 1 (page 5) was developed by Dr. E.W. Manning and is a start at a concept to help scope the perspective of what overall sustainability means. The left side of the model represents the biosphere - the source of biophysical properties on which all of the functions supported by the environment are based. On the right side of the model are the demands which we place on the environment. The nature of the demands are modified by the attitudes and expectations of individuals/societies, yielding a list of wants or needs for goods, services or experiences. Because the products of the environment are seldom identical to and in the same place as the demand, we have created transformation processes to move, alter, combine, safeguard or enhance the natural products and services provided by the environment. Our industrial trading societies rely on steady and assured supply of goods. Natural biosystems do not usually have steady outputs and they have pulsating rhythm. We introduce subsidies (e.g. irrigation, fertilizers) to modify these systems, to ensure steady outputs. We are dampening the naturally oscillating systems on an artificial basis without measuring in advance the negative environmental feedbacks such as soil salinization and groundwater contamination. For most of our history, we have altered the environment to satisfy our demands, or created new transformation processes to serve those demands. For this model to work we must begin suiting the demand side to the limits and opportunities of the environment. Any model designed to assist in attaining advances toward sustainable development will have to address:

- **Reducing or modifying our demands**
- **Improvements to environmental management**
- **Modifying our technologies**

DEVELOPMENTAL INITIATIVES

- 15 Attached at Annex A is a shopping list or menu for decision making support. Created by Dr. Manning it covers the range of techniques, concepts and approaches needed to aid decision makers in industry and government to integrate environmental factors centrally into their decision making process. The information obtained from these initiatives can then be employed in the second model, figure 2 (page 6). The objective of the pyramid is to show the full range of steps necessary to support the attainment of the goal at its apex: sustainable development. At the basis of this construct is the hypothesis that, through better information, leading to better decisions, it will be possible to manage the demands placed on the environment so that they are consistent with the long term ability of the environment to supply them, and also that it will be possible to modify the impacts of humans on the environment in a way that will limit and ultimately control degradation. The barriers to implementation are the old familiar big three economic, cultural and institutional attitudes.
16. Where and how to best apply our efforts to influence those results that come out the top of the pyramid is the next area that needs examination and discussion. As stated by Dr. Maini, the recent Earth Summit in Brazil offers a ray of hope that we are now entering initial phases of serious dialogue in terms of global environmental degradation.
17. In a like manner there is a noticeable increase in open discussion on innovative proposals to involve governments, financial institutions, industry and educational organizations in addressing the world problematique. If indeed those involved in drafting policy and those in a position to influence the decision making process are sensitized, our organization may well be in a position to intellectualize or even conceptualize new approaches to the problems. Prior to selecting strategies or tactics, the next working group must first select an organizational approach. Do we act individually or in small teams within the Ottawa chapter of CACOR, or would it be more realistic to work with international associations under the aegis of the World Association? Another concept would be to form an alliance with other like minded organizations on a national or international basis. Or a combination of individual and group approaches may be judged to be the most advantageous.
18. Once the organizational approach is defined, there are a considerable number of targets toward which we can aim our efforts as outlined in at the end of each subject grouping in this paper, as follows:

Figure 1 TOWARDS A SUSTAINABLE SYSTEM



BASED ON
MANNING, RIZZO AND WIKEN 1990

Figure 2

BUILDING BLOCKS FOR SUSTAINABLE DEVELOPMENT

A. GOAL: UTILISATION OF RESOURCES AND THE ENVIRONMENT TODAY WHICH DOES NOT DAMAGE THE PROSPECTS FOR THEIR USE BY FUTURE GENERATIONS

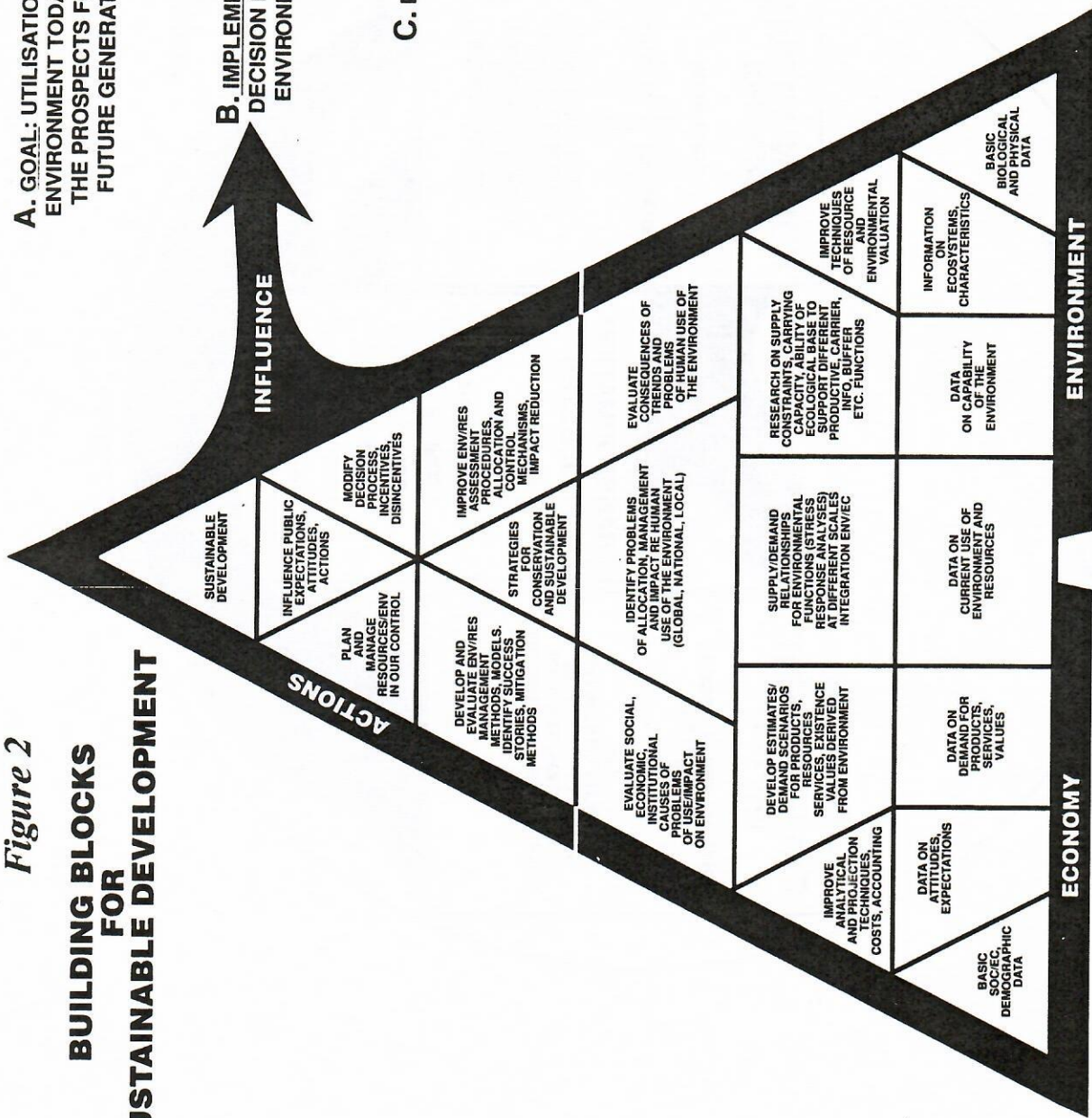
B. IMPLEMENTATION: MODIFYING DECISION PROCESSES TO INTEGRATE ENVIRONMENT AND ECONOMY

C. DEVELOPING SOLUTIONS

D. IDENTIFICATION AND EVALUATION OF PROBLEMS

E. ANALYSIS OF FACTS AND TRENDS

F. DATA/ INFORMATION



E. W. Manning 1990

POPULATION

Education
 Knowledge Transfer
 Research and Development
 Communication

FORESTATION AND BIODIVERSITY

Management Systems and Economic Incentives
 Conservation and Rehabilitation
 Fiscal and Monetary policies

ATMOSPHERE AND ENERGY

Reduction of harmful Emissions
 Conservation and Efficiency
 Alternative Energy Sources

APPLICABLE TO ALL

Management Improvement
 Reducing or Modifying Demands
 Technological Enhancement

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ANNEX A: KEY DECISION-SUPPORT ELEMENTS

The following list covers key components of a comprehensive program for decision-support for managers and decision-makers. It is a catalogue of the data, information, analytical and managerial approaches which are key building blocks towards environmentally sensitive decision-making. The major categories correspond roughly to the levels of the pyramid diagram (level shown in brackets) of Figure 2.

(From a Centre for a Sustainable Future prospectus on *Project Learning: Training Managers for a Sustainable Future*, produced by E. Manning for the Foundation for International Training, Toronto.)

ENVIRONMENTAL INFORMATION (F)

- **Resource inventory/evaluation** covering methods to identify the existence of and importance of key natural

resources such as soils, water resources, and natural heritage

- **Ecosystem Definition/Ecological Classification** - classification methods to identify ecological areas, critical resources, sensitivities and interdependence.
- **Environmental monitoring** for early warning, accountability, management purposes.
- **Environmental indicators**, including assessment of the use of environmental and sustainable development indicators at national, local and enterprise levels.
- **State of Environment reporting** as a means of providing those who need to know with the information on key aspects of the environment and their impact upon it.
- **Knowledge of key sources of environmental information** available from international and national bodies, major non-government and industry sources.

ANALYTICAL PROCEDURES (E)

- **Environmental impact analysis** including state of the art means of effects assessment and prediction, preparation of impact statements, creation of formal process to establish accountability and comprehensiveness, expansion to policy and program level EIA, and evaluation of EIA results
- **Risk/sensitivity analysis** to show levels of risk or of dependence of acceptable outcomes on external events or actions, including analysis of environmental risk, ecosystem sensitivity and project or program sensitivity.
- **Assessment of cumulative effects** resulting from the net effects of many actions or projects. Techniques relate cumulative effects to scale of analysis and planning, and to project and program review procedures.
- **Environmental accounts/resource accounting** as means of building environmental concerns into national [economic] accounting. Approaches include satellite accounts, parallel environmental accounts, and integration of stock values into national/regional accounts, energy balance approaches.
- **Environmental valuation approaches** including opportunity cost approaches, contingent valuation approaches (including willingness to pay, willingness to accept compensation, transportation cost, hotelling, surrogate markets etc., discounting and the future: use of differential or sectoral discount rates, questions of equity: winners and losers, the concept of Pareto optimum, distributive effects, multipliers).
- **Geographical information systems** for the holding, integration, and presentation of information representing attributes of particular places. Course modules include use of GIS for data integration. Data needs.

integration methods, boundaries, overlay methods, system design considerations for decision-support.

- **Prediction: Methods and Applications** Decisions involving the environment often involve predicting future conditions, future stresses, and the effects of actions on the future. Techniques include projection methods development and testing of scenarios, supply constraint models, use of large models.

PROJECT/PROGRAM MANAGEMENT APPROACHES (D)

- **New environmental technologies** including substitution of new materials, technologies, processes, comparative assessment methods, application to specific sectors. Analysis of applications of recycling, reduction, recovery and reuse concepts to different sectors and management regimes.
- **Waste Exchange.** Best practice case studies of methods to turn waste into secondary raw materials. The concept and operation of industrial and community/regional waste exchanges. Profit from waste/waste exchange.
- **Energy efficiency approaches,** including energy audit approaches, in plant, and for the entire materials chain.
- **Success Stories.** Specific applied examples including model factories/businesses. Good models of best practice which can be replicated to the mutual advantage of the manager and the environment.
- **Green office approaches,** aimed at making the office environment efficient and environmentally sound.
- **Environmental audit methods** as applied at the level of the project, firm and supply cycle.
- **Cradle-to-grave product management:** Integrated production cycles/full-cycle management.
- **Integrated resource management approaches** at project, regional and national scales, including concepts of sustained yield and approaches to sustaining a broad range of critical environmental functions
- **Corporate Environmental Accountability:** Environmental reporting in annual corporate and departmental reports. Liability and mitigation procedures.

DECISION-MAKING APPROACHES AND METHODS (C)

- **Structured project and program planning approaches** including logical framework analysis, critical paths, emerging environmental applications.
- **Artificial intelligence** - use of expert systems to risk-reduce decisions.

- **Sources for decision support** - How to identify and get the best results from government/private sources of environmental expertise
- **Evaluation of environmental reports,** assessments and other sources of advice.
- strategies.
- **Multiple objective evaluation approaches:** including a range of techniques for addressing trade-offs between environmental, social and economic goals
- **Means of Visioning** to identify desirable and acceptable/not-impossible futures.

POLICY AND PLANNING TOOLS (B/C)

- **Conservation and sustainable development strategies** to help create a common vision for regions in creating a sustainable future.
- **Ecosystem planning and integrated resource planning procedures.**
- **Consultative procedures:** Delphi/community consultation/round tables/negotiation and conflict resolution.
- **Integrated resource/environmental policies** to establish the framework for environmentally sustainable programs and activities.
- **Policy impact analysis** - measuring the effects of policies and identifying opportunities for alteration and cross-compliance in support of sustainable development objectives.
- **Use of Economic Instruments** such as pollutant charges/markets for pollution rights, use of the polluter-pays principle, no-net-loss approaches, reclamation bonds. Evaluation of regulation approaches vs. market approaches
- **Managing common property resources** from local commons to global commons - approaches and models.
- **Equity and compensation** North-South and intergenerational equity. Vehicles for transfer of capital, foreign exchange leakage, debt for nature swaps, North-south cooperation and consortia, means of capacity building.
- **Environmental Ethics and Business/Government.** What are environmental ethics and how are they changing? How do they affect the managers public and private enterprises? Ethics and the bottom line.
- **Demand management** covering new approaches to modifying demand to suit the supply of functions and capacities of the environment.