environmental management training

an ILO/UNEP Programme
in support of Managers
and Management Institutions

4 ENVIRONMENTAL MANAGEMENT GAME

4

ENVIRONMENTAL MANAGEMENT GAME

edited by

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PREFACE TO THE SERIES

Economic development and technological progress can be compatible with reasonable protection of the environment. New environmental management techniques are in use around the world, helping enterprises to meet their objectives of profit, growth and survival, while protecting the environment.

A series of training materials in environmental management has been developed to support environmental management training in enterprises, training centres and institutes, universities, business schools, projects, etc. The series was produced and tested by the Management Development Branch of the International Labour Office for the United Nations Environment Programme (UNEP) in collaboration with several management institutions. The project team was co-ordinated and the materials edited by Dr. R.G.A. Boland of the ILO.

The materials are published in five parts (separate books) as follows:

Book 1 - General environmental management
Book 2 - Project management and the environment
Book 3 - Production management and the environment
Book 4 - Environmental management game
Book 5 - Supporting environmental management training materials

A technical manual **Introduction to environmental management** for managers, trainers and consultants will be published separately.

The ILO wishes to thank the UNEP for having supported the programme and all institutions and individuals who participated in developing and testing for their collaboration. Your suggestions on how this programme could be further improved will be much appreciated.

PREFACE TO BOOK 4
ENVIRONMENTAL MANAGEMENT GAME

This is the operator's manual for a short environmental management game (SEMG) on man and his environment that simulates events highlighting environmental issues and concerns.

The book has been designed so that reproduction of the materials for each unit can be freely made for training purposes, **without** specific permission from ILO/UNEP. However, care should be taken to ensure that the learners **use** but do **not** retain the **case guide** materials, since easy access to case solutions could spoil the learning process for future learners.

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BOOK 4 - ENVIRONMENTAL MANAGEMENT GAME

CONTENTS

SCOPE OF ENVIRONMENTAL MANAGEMENT

Environmental management promotes due regard for the physical, social and economic environment of the enterprise or project. It encourages planned investment at the start of the production chain rather than forced investment in cleaning up at the end. It seeks to develop integrated systems rather than unrelated bits and pieces and provides for a good relationship with and concern for the local community rather than paying expensive legal fees to fight it.

Some businesses have long understood that environmental protection and economic progress can go hand in hand, for example: .

(a) a chemical company (Europe) with minimal capital investment for recycling its water solvents, eliminated 50 per cent pollution from its operations and saved US $ 400,000 per year;

(b) a manufacturing company (Asia) introduced waste recovery for atactic polypropelene production to improve annual profits by US $ 500,000;

(c) an oil refinery (Europe) turned its hydro-carbon pollution into by-products that produced profits of US $ 1 million per year;

(d) a chemical company (Americas) reduced its annual pollutant load by 75 per cent and achieved cost savings of US $ 2 million per year.

Yet, in many countries, industrial companies failed to train and provide for reasonable environment management. The unfortunate results have received international publicity and seriously threatened the profitability, growth and even survival of these enterprises.

The dimensions of environmental management are increasing each year as governments become aware of the political priority of reasonable environmental protection and its links to economic development and technological progress.

Environmental management covers such **general areas** as environment and enterprise objectives, scope and structure of the environment, interaction of nature, society and the enterprise, environmental impact assessment, economics of pollution prevention etc.; such **project areas** as project development, implementation, monitoring and evaluation; and such **production areas** as production management and the environment, product design, technology choice, waste management and production systems.

NEED FOR TRAINING

Special training is needed to deal with the broadening scope of environmental management since widely publicised environmental incidents have motivated governments towards the stricter legal enforcement of environmental standards. Training must have an impact on knowledge, skills **and** attitudes of managers in order to improve environmental management efficiency and effectiveness.

If a company looks at economic questions in an ecological way and at ecological questions in an economic way, it can focus attention on waste avoidance and efficient operations which can increase **profitability.** By carefully investigating new areas in which to develop new products and services, it can achieve **growth.** By avoiding conflict and winning community acceptance with skillful concern for reasonable environmental values it can improve its chances of **survival.**

Since 1981, the ILO/UNEP project to introduce an environmental management training component into management development programmes has carried out workshops and seminars in Asian countries.

These activities have led to the preparation of a whole series of training manuals and FLPs (Flexible Learning Packages). This material, of proven technical quality and learning effectiveness, is now ready for application to environmental management training in developing countries.

FOR THE OPERATING MANAGER

Environmental management training must be **relevant** to the current problems of both the enterprise and the community. Such training heightens the awareness of operating managers to environmental issues, strategies and alternatives. It helps them to use environmental language and concepts and to seek creative alternatives in anticipating and dealing with potentially difficult environmental situations.

Training for environmental management is essentially **preventive** in that it encourages management policies and decisions which **avoid confrontation** with the community on environmental issues. It helps managers to communicate effectively with technical staff on environmental problems in the search for cost savings or **the generation of new income** for the enterprise.

FOR THE TRAINING MANAGER

The training manager responsible for organising environmental management training, will find ILO materials readily available **to fit local training systems** in companies, projects, etc., since any unit can easily be adapted to include local cases and data.

The whole of the FLP training series in environmental management requires only flip charts, tables and chairs. No expensive equipment is needed. Any one unit may be used independently **or** in a series **or** as part of a longer programme, **or** with additional speakers and materials.

Above all, FLPs are cost effective. They can be run by general management trainers (quickly trained by the ILO), or, when technical specialists are used, the FLP system enables them to be **better trainers,** i.e. with the wide variety of learning materials available in each unit there is less need for long technical lectures and **active** «learning by doing» may be extensively employed.

FOR TRAINERS AND TEACHERS IN INSTITUTES

For trainers and teachers in training institutes, universities, business schools, etc., the ILO environmental management materials are readily available to fit existing programmes.

The instructor can use the materials to lecture formally or can encourage extensive learner participation. No special equipment is required for any of the FLP series; any one unit may be used independently, or in a series, or as part of a longer programme, or with additional speakers and materials.

With such a variety of learning materials available in each unit there is less need for long technical lectures and more opportunity for «active learning by doing». The instructor may select those parts of any unit to be assigned for work before, during or after the formal class sessions. «Active learning by doing» may be employed and the technical specialist is thus enabled to be more efficient and effective in managing the learning process.

FLP MATERIALS

FLP (Flexible Learning Packages) are four-hour intensive learning units which are flexible as to mode of instruction, general and local content, culture, language, etc., and are immediately applicable for use in companies, training institutes, universities, business schools and projects that have an environmental management training component.

Each FLP unit includes a workpack and a case guide and can be used in a variety of ways according to the requirements of the instructor, the learners and the situation. Each unit can be used individually or in a series co-ordinated with other materials and activities. It can be **translated into the local language** and be adapted to include local materials, minicases, exercises etc.

Each unit consists of a workpack and a case guide as follows:

Workpack - retained by participants, includes:

- learning objectives for the unit;

- a study note of about four pages consisting of seven major points (with sub-points) that provide the key inputs which may be supported by learning patterns, programmed learning, films, etc. as appropriate;

- a main case, three or four pages long, highlighting five key questions to facilitate controlled and structured analysis; a second case may be added for special environmental issues;

- four to six minicases covering a whole variety of decision situations relevant to the main topic;

- exercises with solutions to enable the learner to practise appropriate calculations;

Case guide - used but **not retained** by participants (to avoid solutions becoming known to future learners), includes:

- answers to the main and secondary cases;

- answers to minicases;

- quiz of 20 questions;

- answers to the quiz.

Thus the FLP system provides:

- units of environmental management training which fit easily into a general system of management development;

- tests and measures of the need for specific areas of environmental management training;

- training materials that can be used not only by technical specialists, but also by experienced general trainers who may not always be experts in the technical content, but are well able to manage the learning situation effectively;

- cost-effective learning materials which are easily adapted to the varying requirements (time, content and learning style) of the various learning situations of developing countries;

- an action-planning component in each learning unit which encourages the learner to plan the application of newly acquired knowledge, skills and attitudes to specific practical issues.

Overall, FLP is a system of management development which differs from and contributes to conventional methods of training. It combines practical small group activities, studies, case analysis, minicases and exercises in a controlled learning environment which guarantees consistent quality each time. Continuous feedback and monitoring in the learning process ensure that skills are acquired rather than being only partially understood as is sometimes the case with traditional management training methods.

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ENVIRONMENTAL MANAGEMENT GAME

Short Environmental Management Game

International Labour Office Geneva

environmental management training

an ILO/UNEP Programme in support of Managers and Management Institutions

Short environmental management game (SEMG)

Game operator's manual

Contents

Note:

The game operator must reproduce the following special annexes as materials for the participants:

Annex G - Confidential CC roles (1 copy)
Annex H - Zonal map (6 copies)
Annex I - Participants manual (25 copies)
Annex J - Community Council manual (7 copies)

INTRODUCTION

1. This is the operator's manual for a short environmental management game (SEMG) on man and his environment that simulates events highlighting environmental issues and concerns.

2. The game was developed from work done by O.T. Dueñas, A. Guanzon, and F. Pimentel of the University of Life in Manila, Philippines who have extensive experience in simulation games.

3. SEMG uses project planning and development to make the players more aware of environmental issues. It enables them to enact their respective roles using initiative, resourcefulness and creativity. People's perceptions, values, and reactions vary and, as a result, the game will be different each time it is played. Do not let this worry you.

4. The best way to learn the game is to run it. Use the materials in the manuals (400 blue chips and 100 green chips) and let the game proceed!

THE MODEL

1. In the SEMG, a Third World community is in the process of indentifying and formulating projects that will improve the livelihood of the community. The need to give equal consideration to the political, social, cultural, physical, economic and technological effects of a project is one of the main aims of the game.

2. The game is played by two interacting sides or roles:

    (i) community leaders who establish policies, approve projects and release development funds; and

    (ii) community sectoral groups (agriculture, fishing, mining, cottage industries, etc.) needing funds for development.

3. In formulating policy, community leaders direct, motivate and regulate the development efforts of the community.

4. The sectoral groups generate the livelihood of the community. Each sectoral group is divided into subsectors (i.e. the agricultural sector is subdivided into rice production, corn growing, etc.). Subsectors have their own potential provided they are given proper assistance and opportunities.

5. Interaction between the two roles brings about some of the critical stages in the development of the project and its management cycle.

6. In the SEMG, capital worth is measured in land and blue chips (money). The Community Council and the game operator reward environmental concern with green chips. When the game is over, the score is calculated on the basis of the value of land, money and green chips held by the players (one green chip equals five blue chips).

TECHNICALITIES OF THE GAME

1. <u>Purpose of the game</u> is to awaken awareness and understanding of the
need to give equal importance to the political, social, cultural,
physical, economic and technological environment at every phase of the
project.

2. <u>Players</u> may be:

- policy makers

- project managers

- environmental planners

- enterprise managers

- community-based workers

- trainers

- members of a community.

The game should not normally be changed to accommodate special
groups. Individual experiences and knowledge will become relevant during
post-play discussion and in the follow-up sessions.

3. <u>Number of participants</u>: The game can be played by a group of 20 to
45 players. The ideal number is 25.

4.   Running the game: At least two operators should run the game.   They should be familiar with details of the game and play which they will have learned during test runs.

5.   Time required: The game lasts approximately four to six hours as follows:

		Minutes
(a)	Introduction	30
(b)	Game	210
(c)	Post-play discussion	60
		300

6.   Space required: One large room, tables (at least five) and sufficient chairs for all players (see Annex B).

7.   Materials required: The game is made of materials that are easy to find and reproduce (i.e. paper, blue chips, green chips and flip charts).

8.   Values

   (a)   Money (blue chips).
   (b)   Environmental concern (green chips).
   (c)   Land (initial value: one blue chip per unit).
   (d)   Capital - Community Council (200 blue chips, 50 green chips).
   (e)   Capital - each sector (6-10 land units, 50 blue chips each sector).
   (f)   Capital - game organiser (50 green chips).

GAME OVERVIEW

1. The game simulates a community that is setting up a development project. Community leaders determine criteria and guidelines for approving projects and releasing available funds. The agricultural, cottage industry, mining and fishing sectors are busy assessing their projects (personal goals, expansion, effects on community life and its political climate, etc. are considered). Each sector identifies projects to present to the community council.

2. Events from the "events sheet" are introduced at the discretion of the operator based on his assessment of the situation and the pace of the game. An event describes a decision or situation and explains the effect it will have. Players may respond as they see fit. The event may be exchange rate fluctuations, natural calamities, unemployment, environmental issues, etc. In this way, the pace is increased, the situation simplified or made more complicated. Excitement, enjoyment, challenge are provided.

3. Information on how the game works is contained in the role cards which describe the roles assigned to each participant. There are two major interacting roles:

(a) Community leaders (seven): three are appointed by the game operator and four by the sectors. The Community Council (CC) receives standard role specifications but each member has personal characteristics described in the confidential role instructions (Annex G).

(b) Sectoral groups (four) must provide viable, feasible, livelihood projects. Each sector has at least four subsectoral roles. For example, the agricultural sector has players to represent the corn growers, rice producers, etc.

4.   Ample time must be provided for post-play discussion to allow for:

(a) participant reaction to what occurred during the game (i.e. arguments, disagreements, hurt feelings, etc.);

(b) a systematic examination of the model from the view point of the various roles to give everybody a chance (i) to see what happened from the other players' point of view, and (ii) to relate such roles to different environmental dimensions;

(c) comparison to be made between the reality of the participants' own experiences and the situation represented in the game so that previous perceptions are refined and lead to sharpened awareness on environment issues;

(d) answers to be given to (four) specific questions and ten learning points to be listed reflecting the game experience.

RUNNING THE GAME

TENTATIVE TIMETABLE FOR THE GAME

	Minutes
I. INTRODUCTION	
1. General introduction	15
2. Game instruction	15
	30
II. GAME OPERATION	
1. Start of the game	20
2. Observe CC	10
3a. Event No. 1	30
3b. Decisions	30
4a. Event No. 2	30
4b. Decisions	30
5a. Event No. 3	30
5b. Decisions	30
6a. Event No. 4	30
6b. Decisions	30
7. Game ends	30
	300
III. POST-PLAY DISCUSSION	
1. Small group	45
2. Main group	45
	90
Total Time (minutes)	420

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Fig. 1 - Beginning the game.
The CC in action.
(Event No. 1).

Fig. 2 - Sectoral group
planning development project.
(Event No. 1).

Fig. 3 - Discovering gold.
planning development project.
(Event No. 2).

Fig. 4 - Government
control of gold mining.
(Event No. 3).
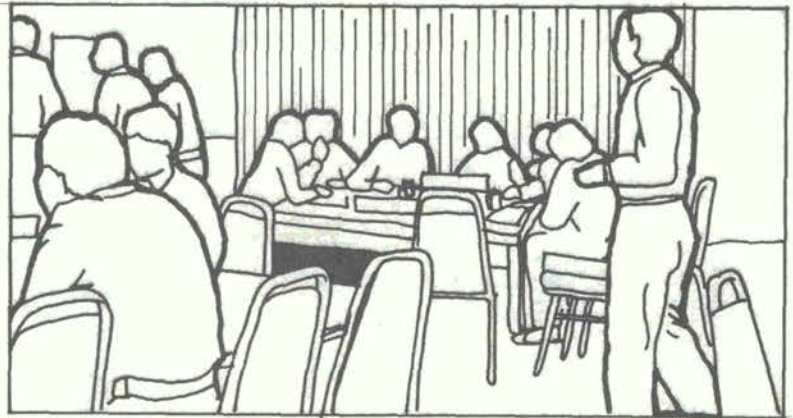
Fig. 5 - Dealing with
the pollution of the
lake (Event No. 4)
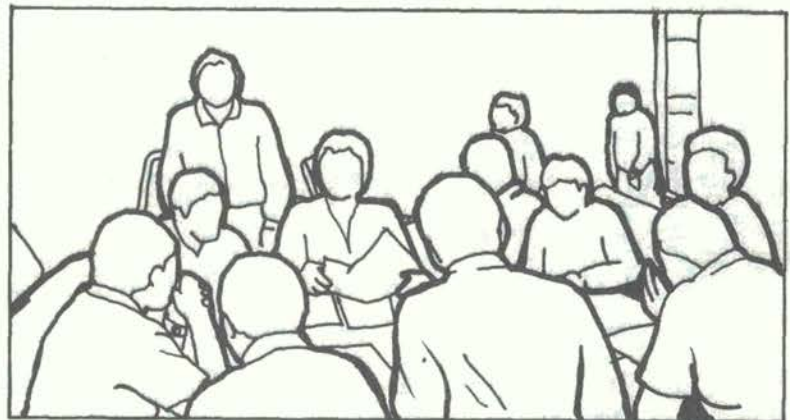
Fig. 6 - Post-play
discussion.
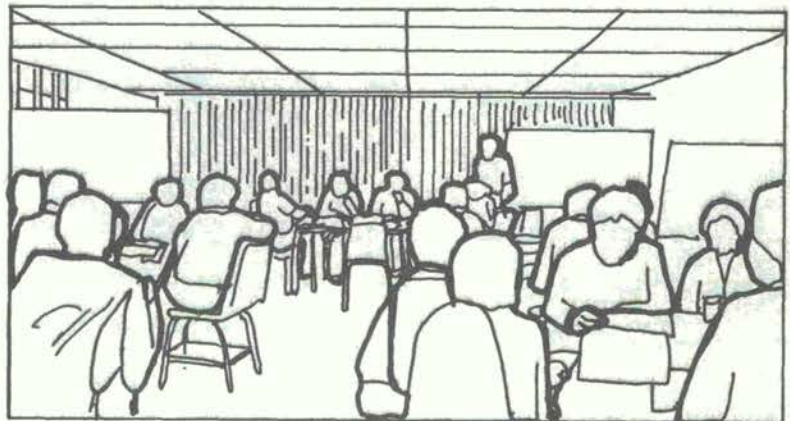
I.   Introduction by the operator (30 minutes)

1.   General introduction (15 minutes)

(a)   Describe the sequence of the game and its key points.

(b)   Emphasise the environmental dimensions of the game and environmental management issues and problems.

(c)   Outline the basic roles to be played in the game and the types of decisions that will be taken.

2.   Game instruction (15 minutes)

(a)   Invite the participants to take their places in accordance with the layout (Annex B).

(b)   Distribute to each participant a Participant's Manual (Annex I) to study and discuss, and to each group a zonal map (Annex H).

(c)   Designate three participants as general members of the Community Council (CC) and invite them to go to the Council table. Give them a copy of the Community Council Manual (Annex J) to study and discuss.

(d)   Describe the use and value of the blue chips and tell the CC confidentially that the green chips will be used to reward environmental concern but that this is not to be revealed until the end of the game.

(e)   Each sectoral group elects one member to the CC who takes his place at the Council table and studies the CC Manual.

II. Game operation (300 minutes)

1. <u>Start of the game</u> (20 minutes)

(a) Announce the start of the game.

(b) Remind the CC to start their deliberations. Repeat the object of the game.

(c) Remind the sectors to begin discussions.

(d) Deal with questions as they arise.

2. <u>Observe proceedings within the CC and the sectors</u> (10 minutes)

(a) The CC should deliberate on matters concerning community welfare and development. For example, the sale of land, subsidies for development, regulations, etc.

(b) At the same time, the sectors should devise and assess their projects (personal goals, land purchase, development, expansion, effects on the community and the political climate of the community).

3A. Announce event No. 1 (30 minutes)

(a) Read the first event (Annex A) and write it on the flip chart. Event No1 concerns the availability of financial loans from the national government. Criteria for loan release depends upon the guidelines to be set by the CC.

(b) The CC will begin to deliberate and set criteria to release development loans.

(c) Each sector group will stop whatever it is doing and concentrate on preparing project proposals.

(d) Information on project proposals can be obtained from the CC and may be paid for in blue chips. When information cannot be otained participants must find the answer for themselves.

(e) Each time a participant asks for information about the environment, the CC or the game operator will give him a green chip. (The significance of the green chips will not be announced until the end of the game.)

3B. CC decisions (30 minutes)

(a) As soon as each sectoral group has finished a proposal, it submits it to the CC and then resumes its previous activities. The game operator may introduce subevents as appropriate.

(b) The CC is expected to decide immediately on these proposals. Projects with environmental considerations are approved. The CC may sell land for cash or credit with or without awarding cash or green chips.

(c) After processing all the proposals, the CC now decides to announce the approved projects. Approved projects may be given blue chips, representing fund allocation; they may be used to acquire additional land units later in the game.

(d) On announcing the results of their project evaluations the CC may decide to announce their criteria, or it may not.

(e) Immediately after the announcement of approved projects and with the approval of the CC, sectors may start their projects by identifying land units on the main map.

(f) The operator assists each sector to identify the units on the big map in order to facilitate the activity and avoid confusion and overcrowding within the vicinity of the community map.

(g) The sectors may rewrite rejected projects and continue to submit new projects throughout the game, if necessary.

4A. Announce event No. 2 (30 minutes)

(a) The timing of the announcement of event No. 2 is based on the status of land acquisition by the sectors; wait until most of the sectors have identified their approved land units.

(b) Read event No. 2 and write it on the flip chart. Gold has been discovered at a particular site (land units bordering the lake - see Annex A).

4B. Decisions (30 minutes)

(a) At this stage, it is expected that different sectors will start land speculation with the CC and each other.

(b) It can also be expected that the CC will pass some legislation to regulate the use of gold-bearing land units. They may draw up guidelines on gold use.

5A. Announce event No. 3 (30 minutes)

(a) Event No. 3 supercedes whatever legislation the CC has made. It announces that the national government has decreed that all gold bearing land is state property and, if approved by the CC, is available for mining.

(b) It also stipulates that the CC will now be asked to formulate economic and environmental guidelines.

5B. Decisions (30 minutes)

(a) Each sector may still bid for mining rights to the gold-bearing land as long as it includes environmental protection measures in its proposals.

(b) The CC may grant sector mining rights to land units with gold.

6A. Announce event No. 4 (30 minutes)

(a) Wait until the CC has granted mining rights to all gold-bearing land before announcing event No. 4.

(b) Event No. 4 states that after five years the lake has become severely polluted and needs rehabilitation; it reveals that mining projects operating near the lake have polluted it in spite of individual environmental protection measures.

6B. Decisions (30 minutes)

The CC and the sectoral groups work on lake rehabilitation proposals with appropriate rewards and penalties in blue and green chips.

7. Game ends (30 minutes)

(a) The game operator announces the end of the game and each sector calculates the value of its holdings as follows:

Land: one unit.
Blue chips: one unit.
Green chips: five units.

(b) Total holdings are recorded on the flip chart.

III. Post-play discussion (90 minutes)

1. ### Small group discussion (45 minutes)

(a) CC members join appropriate small groups for discussion.

(b) Participants should have the opportunity to speak out on arguments, disagreements, hurt feelings, etc., that have occurred during play. Steer the discussion away from personal attacks and direct it to the reasons why those things happened.

(c) Each SG discusses questions 1 to 5 (see following pages) and, to ensure commitment, the answers are written on a flip chart.

2. ### Main group discussion (45 minutes)

(a) Senior management from relevant organisations concerned with environmental issues are invited to the sessions.

(b) The game operator leads a systematic examination of the model presented in the game and by the roles. One way of doing this is to take an issue that was presented and invite different players to give their opinion from the perspective of the role they played.

(c) The game operator should focus on the reality presented by the game rather than the game itself, and consider the different environmental dimensions in project management.

(d) The Community Council presents an integrated programme to rehabilitate the drying lake culled from proposals/recomendations, submitted by the sectors. The sectors are given green chips for each proposal accepted and included in the integrated plan.

(e) Discuss the answers to the questions emphasising reality rather than the game simulation.

RUNNING THE GAME

QUESTIONS FOR SMALL GROUP DISCUSSION

1. <u>Purpose</u>

   What were the objectives of the game? To what extent were they achieved?

2. <u>Perceptions</u>

   Did anyone ever consider environmental issues upon the announcement of event No. 1? While preparing your proposals, was anyone either as a sector or as an individual ever conscious of asking questions related to environmental concerns? If yes, what environmental issues were raised? How were they used in the proposal?

3. <u>Pollution</u>

   Was pollution inevitable in the early stage of the game?

4. <u>Protection</u>

   How would the government have protected the environment?

5. <u>Learning points</u>

   List the 10 key learning points from this simulation.

1. Purpose

(a) To help participants become more aware of the political, social, cultural, physical, economic and technological environments which affect, and are affected by their projects and work.

(b) To learn how to incorporate environmental issues into management decisions.

2. Perceptions

Varying with each small group.

3. Pollution

(a) Yes, because the sector's priorities were to achieve economic development rather than prevent environmental damage.

(b) Any benefits to the environment were passively derived from the economic activity, and were brought about by any active environmental management.

4. <u>Protection</u>

    The Government could have protected the environment by:

(a) Setting specific environmental regulations and standards for air, land, water, etc.

(b) Providing financial incentives for environmental management which would <u>prevent</u> pollution.

(c) Restricting/banning polluting industries.

(d) Routine testing of the environment.

(e) Policing industries for pollution levels, etc.

(f) Raising tax funds to "clean-up" the environment.

(g) Repairing environmental damage early.

(h) Setting up a specific department or experts with responsibility for reviewing project proposals <u>before</u> giving any financial support.

(i) Requiring all development projects to submit an Environmental Impact Assessment (EIA) with every project proposal.

(j) Giving the environment a higher priority even if it restrained economic development.

5. Learning points

(a) Economic development inevitably leads to some form of environmental damage.

(b) Political pressures are necessary to push governments and enterprises to control and protect the environment.

(c) Economic benefits for some are usually detrimental to others.

(d) In the short-term, a community may choose economic development over environmental control/protection.

(e) Government is not free to protect the environment as a number one priority; it has to consider many other factors.

(f) Sometimes technical improvements to prevent environmental damage may not be economically feasible.

(g) Environmentally acceptable industries may easily be destroyed by more economically profitable ones.

(h) Control and monitoring of environmental impacts by enterprises alone is never adequate for pollution prevention; government intervention is necessary.

(i) Despite all reasonable environmental precautions, some industries will always damage the environment.

(j) All environmental management decisions are compromises involving politics, finance, technology and cultural values.

MAIN EVENTS

(Instruction: At the proper time, write each event on the
flip chart and announce it to the CC sector groups)

Event No. 1

The national government announces the availability of financial
loans for livelihood projects; all sectors must prepare project
proposal(s) for the CC.

Event No. 2

Gold has been discovered in land area covering unit Nos. 68, 69, 70,
71, 72, 73, 74, 84, 85, 88, 107, 118, 119, 120, 124, 134, 139, 140, 150,
151, 169 and 170.

Event No. 3

The national government has decreed that gold bearing land is state
property; therefore those occupying land units where gold is found are
expropriated for mining development.

The CC is directed to pay sectors and residents affected; residents
should vacate the land units.

Event No. 4

After five years, the lake is severely polluted in spite of
environmental protection measures taken by individual mining project
groups; it requires immediate rehabilitation by the CC and the sectors.

EXTRA MAIN EVENTS

(if needed)

Event No. 5

The National Government has expropriated land units Nos. _____ for a resettlement and/or irrigation scheme.

Event No. 6

Excessive cutting of forest and floods have affected land units _____.

SUBSECTOR EVENTS
(if needed)

Purpose - while sectoral groups await CC decisions on projects submitted, these sub-events (without prejudice to the whole game) will keep the sectoral groups inter-acting. They may be introduced one at a time during deliberations on project criteria for project approval.

1. You want to diversify your business, so explore possible business opportunities in other sectors (e.g. fishing and agriculture). This can be given and announced to any sector.

2. The loan on your land or building from the mining sector is about to mature. You meet with mining sector to negotiate the loan.

    The loan your company extended to the cottage industry sector on land units 92, 87, ___, etc., is about to mature. Cottage industry sector will negotiate with you. (To be given and announced to any two sectors of your choice).

3. You provide a financial loan to the cottage industry sector for a business venture you both agree on.

    Your group has received financial assistance for your sector from a subsector (same as No. 2 above).

4. Land units Nos ___, ___, ___, ___, are opened for exploration (sub-sector mining). Transact with the Council (you may choose the land units that would create more active interaction).

ROOM LAYOUT

Community Council

Game Operators

COTTAGE INDUSTRY SECTOR

MINING SECTOR

AGRICULTURE SECTOR

FISHERY SECTOR
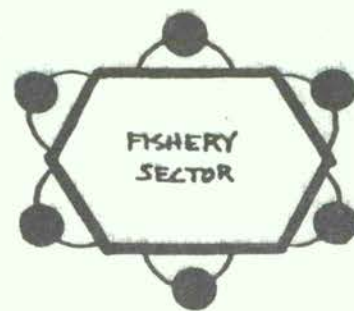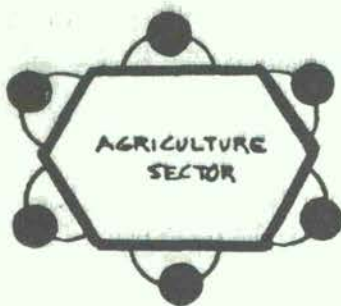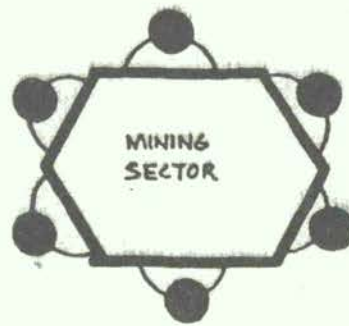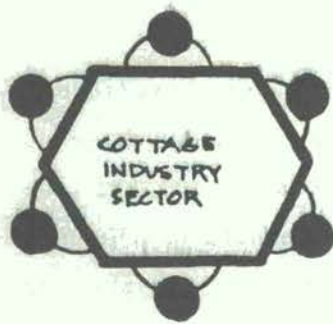
REMINDERS FOR THE GAME OPERATOR

1. Do not take too long on the introduction. It may spoil the fun and excitement of the whole activity.

2. Be very positive in the introduction and briefing. Convey the idea that it will be a good learning experience. Be enthusiastic.

3. Explain that some confusion may be expected at first.

4. The operator should test-run the game once or twice with different groups to become familiar with the game, to obtain confidence and run it creatively and flexibly.

5. Chips - two types of chips are used:

(a) Green chips are given to the CC by the game operator immediately after the game instructions; they are used to reward sectoral group members who ask questions about environmental issues (e.g. what are the effects on the environment if we set up this mining project?). They may also be awarded by the CC and the game operator for showing environmental concern in project proposals.

The significance of the green chips is announced only at the end of the game by the operator. Green chips (valued at 5 blue chips for 1 green chip) will determine which groups are aware of the environmental dimension.

(b) Blue chips represent wealth. They are distributed by the operator to the CC (200) and the sectoral groups (50 each) when game instructions are given. Sectoral groups may receive additional chips from the CC as funds for approved projects. These chips may be used to acquire land units in addition to that allocated and approved by the CC for a project. Blue chips may be awarded as project funding or confiscated for taxes or penalties any time during the game.

Land can be acquired using blue chips either from the CC or from other sectors.

Blue chips are the exchange medium for anything the players may want.

The game operator may allow unexpected things to happen without fear that the purpose of the game will be hindered.

In general, all information requested from other sectors has monetary (blue chip) value, but not when requested from the Council.

6. Several maps are provided in the game:

(a) The big zonal map (made up of six sheets Annex H)

Each sector and the CC should have a zonal map. The key CC map is to be displayed in a place seen by all at the start of the game. This map will be used by each sector when projects are approved to identify the land units approved by the CC for their projects.

Land units are identified by each sector with the assistance of the game operator, or the game operator may ask the Chairman of the CC to have some Council members assist the sectors. Identification of land units will be by the corresponding letter (e.g. Agricultural sector - A) to be marked on the respective allocated land units.

All lettered land units are considered owned by respective sectoral groups, e.g. "M" land units belong to the mining sector. All unidentified land units are under the jurisdiction of the CC. The CC can designate certain uses for these land units.

(b)   Small zonal maps are in the participants manual.

(c)   All sectors, however, may use the big CC zonal map for reference.

NOTE:

Additional suggestions to improve the game:

1 -   Develop a matrix of events from wich operators may choose depending on the outcome of previous events (this does not apply to gold and loan land units).

2 -   Operators may asign monetary values to blue chips and land units to facilitate transactions, performance measurement and resource management: thus creating a competitive atmosphere.

NOTE ON GAMING SIMULATIONS

Simulation games provide a challenging and stimulating method of learning. They appeared in the social sciences only recently and have gained rapid acceptance. They have three basic uses: research, education and public policy.

In both the classroom and the community, games are viable alternatives to the lecture method for discussing problems. They supplement but do not replace other methods and encourage active participation in discussions of complex issues. Contrast this with the formal lecture method where most of the participants are forced to become inactive "sponges" or alternatively, are permitted to speak only in turn, as time permits.

The game format is spontaneous and creates a better ambience for dialogue. Games are a radical departure from classical instructional methods of reading and lecture and the variety motivates both instructors and participants.

Games involve people in their play as well as in their design for three main reasons:

(a) Participants take roles and argue problems from their own perspective. If the roles are carefully selected, a balanced and spirited discussion ensues. Even though you may be playing "Devil's advocate" in your role, your understanding of the problem is heightened.

(b) Games organise complex details into an overall model that people can remember for a long time. Peoples' emotional involvement enhanced by the game, also helps them remember things.

(c) Games require decisions, and this commitment sharpens peoples'
    thought processes. In the subsequent defense of those decisions,
    the players benefit from more focused discussions.

Games help change the instructional atmosphere from a formal
authoritarian one to a more interactive, informal one. Trainees are more
relaxed, and less likely to resist the training. Moreover, the instructor
becomes free to observe, supervise and provide feedback on the activity
of all participants.

Consequently, the instructor becomes more of a facilitator of the
learning process - one who questions, models, encourages, critices and
structures the learning process rather than merely someone who dispenses
information. The involvement of the participants increases the
likelihood that their attitudes will change as their knowledge and skill
increase. To the degree that this is true, the probability of retention,
as well as transfer to the work environment often increases.

Despite some similarities, gaming simulations differ from role
playing exercises. Role playing is a component of gaming simulations,
but gaming also includes other components. In games, roles are defined
in interactive systems, this emphasis is on the role as it interacts with
other roles, and the model creates the dynamic interaction, the
constraints, rewards, and punishments. In most role-playing exercises,
each participant is assigned a role and given only the general outline of
a situation, from which the action is free wheeling.

In games there is little second-guessing in terms of personalities
of particular people or positions; in addition to the roles and scenario,
participants are given goals to orient their behaviour; resources to
attempt to meet their goals; rules to govern their actions; the order of
play; the consequences of violations and the environmental responses
based on a given scenario. Role playing often entails only the
participation of some people while in a gaming simulation all
participate; no one is a passive observer.

KIT CONTENT

1. Community Council

(a) Zonal map (Annex H)

(b) Participants manual (Annex I)

(c) Community Council manual (Annex J)

(d) Confidential Community Council roles (from Annex G)

(e) Blue chips (200)

(f) Green chips (50)

2. Sectoral groups

(a) Zonal map

(b) Participants manual (each member)

(c) Blue chips - 50 (each group)

(d) Green chips (initially) - 0

3. <u>Game operator</u>

(a) Zonal map

(b) Participants manual

(c) Community Council manual

(d) Event sheets (from Annex A)

(e) Green chips - 50

(f) Flip chart

Note: The game operator must reproduce the following special annexes
          as materials for the participants:

          Annex G - Confidential CC roles (1 copy)
          Annex H - Zonal map (6 copies)
          Annex I - Participants manual (25 copies)
          Annex J - Community Council manual (7 copies)

Land unit = 1 square

Instruction: Cut out each land unit (1 square). This will be used to
                record changes in each land unit as transactions are made
                (e.g. if the CC passes a bill designating certain vacant
                land units as mining areas then these squares will be
                noted and changed on the CC zonal map on the appropriate
                land unit).

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CONFIDENTIAL CC ROLES

(Instruction: cut each role out and distribute it to one
CC member who will assume the role)

1. Role of Council Leader (no sectoral affiliation)

    Instruction: keep your role confidential from the Community Council
    members

    (a) You are a highly respected elder in the community.

    (b) You own a big tract of land which you expect will increase in value
         when business is established on or near your land.

    (c) You are officially authorised by the government to approve and
         release project funds upon endorsement of the Council members.

    (d) As a Council leader, you call for Council meetings to legislate or
         review existing land use, economic and/or social-oriented policies
         affecting the community.

    (e) You provide directions in consultation with other Council members on
         national community issues.

    (f) You are an output-oriented leader who works fast, gives time limits,
         etc.

    (g) You assist the community when necessary.

2. Role of Council Member (no sectoral affiliation)

   Instruction: keep your role confidential from the Community Council
   members

   (a) You attend meetings called by the Community Council.

   (b) You endorse projects.

   (c) Your main interest in being a Council member is the welfare of the
   villagers.

   (d) You are a retired admiral with over 30 years service.

3. Role of Council Member (no sectoral affiliation)

   Instruction: keep your role confidential from the Community Council
   members

   (a) You attend meetings called by the Community Council.

   (b) You endorse projects.

   (c) You are a person who speculates and explores probable business with
   the different sectors and can provide capital for businesses.

   (d) You live about 30 miles from the lake.

4.   Role of Council Member (Mining affiliation)

Instruction: keep your role confidential from the Community Council members

(a)   You attend meetings called by the Community Council.

(b)   You endorse projects.

(c)   Your family has been in the mining business for 20 years.

(d)   You live on land unit R71.

5.   Role of Council Member (Fishing affiliation)

Instruction: keep your role confidential from the Community Council members

(a)   You attend meetings called by the Community Council.

(b)   You endorse projects.

(c)   You are an entrepreneur in the fishing business.

(d)   You live directly on the shore of the lake.

6. Role of Council Member (Agricultural affiliation)

   Instruction: keep your role confidential from the Community Council members

(a) You attend meetings called by the Community Council.

(b) You endorse projects.

(c) You believe that the community is best suited for agricultural activities.

(d) You are against imported fertilizers and are interested in developing locally-produced organic fertilizers.

(e) You own land unit No. 221 - Bat Island.

7. Role of Council Member (Cottage Industry affiliation)

   Instruction: keep your role confidential from the Community Council members

(a) You attend meetings called by the Community Council.

(b) You endorse projects.

(c) You are the president of the Cottage Industry Association which covers all cottage industry in the community.

(d) Your family has lived in the village for over 200 years.

ZONAL MAP

The following six sheets can be reproduced and attached together with scotch tape to provide a large zonal map for the CC and each sectoral group.

1	2	3	4	5	6
17	18	19	20 A	21 A	22 A
33	34 A	35 A	36 A	37	38
49	50	51	52	53	54
65	66	67	68	69	70
81	82	83	84	85	86
97	98	99	100	101	102
113	114	115	116	117	118

	7	8	9	10	11
	23	24	25	26	27
	39	40	41	42	43
	55	56	57	58	59
	71	72	73	74	75
	87	88	89 F	90 F	91
	103	104 F	105	106	107
	119	120	121 LAKE	122	123

12	13	14	15	16
28	29	30	31	32

ADJOINING
VILLAGE

44	45	46	47	48
60	61	62	63	64
76	77	78	79	80
92	93	94	95	96

M   M

108	109	110	111	112

M

124	125	126	127	128
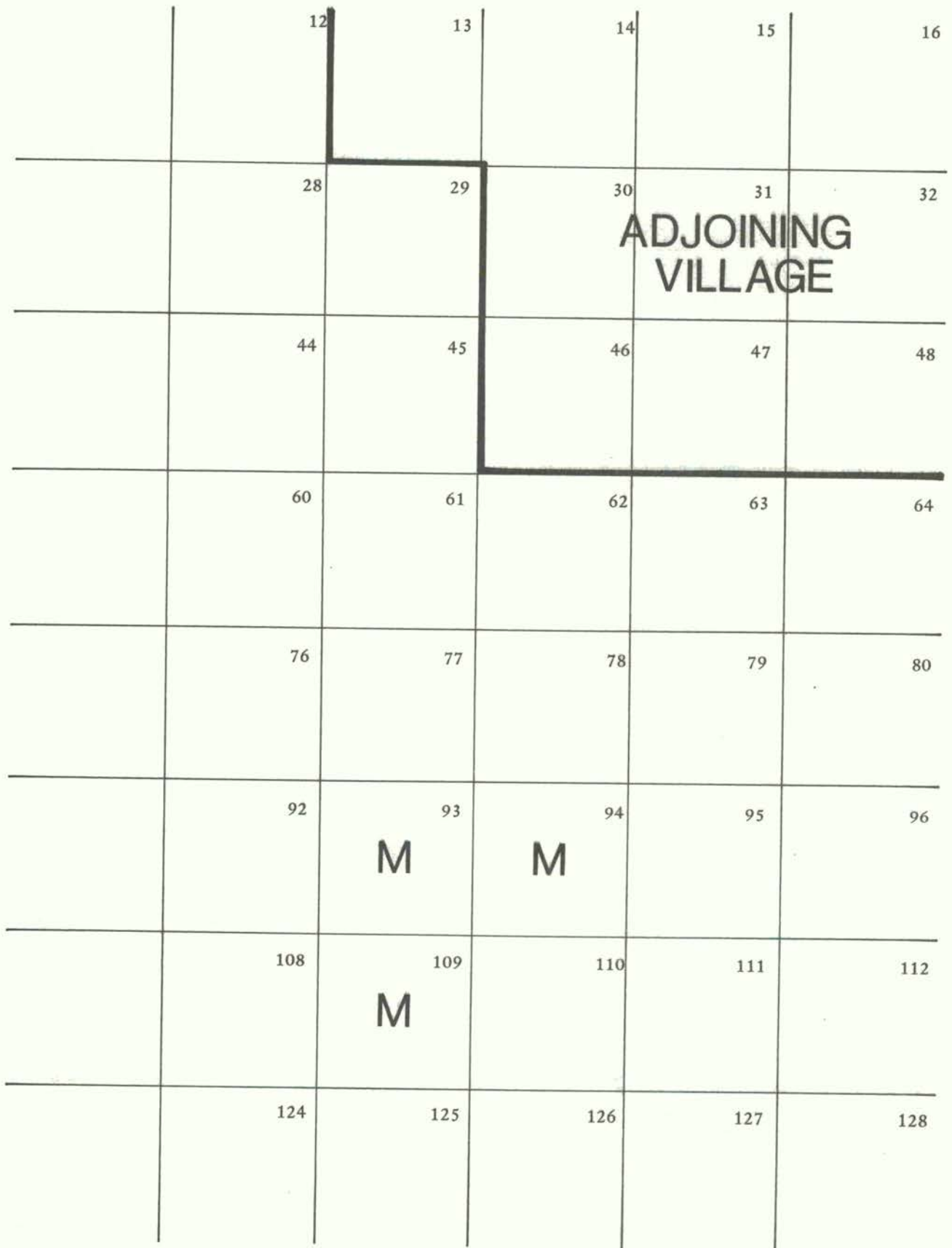
129	130	131	132 M	133 M	134
145	146	147	148	149 M	150
161	162	163	164	165	166
177	178	179 C	180 C	181	182
193	194	195	196	197	198
209	210	211	212	213	214
225	226	227	228	229	230
241	242	243	244	245	246

	135		136		137		138		139
	151		152		153		154		155
	167		168		169		170		171
	183		184 C		185 C		186		187
	199		200		201		202		203
	215 C		216 C		217		218		219
	231		232		233		234		235
	247		248		249		250		251

	140	141	142	143	144
	156	157	158	159 F	160
	172	173	174	175	176 F
	188	189	190	191	192

MEIRIN SEA

204	205	206	207	208
220	221	222	223	224

BAT ISLAND

236	237	238	238 F	240
252	253	254	255	256

- EG.51 -
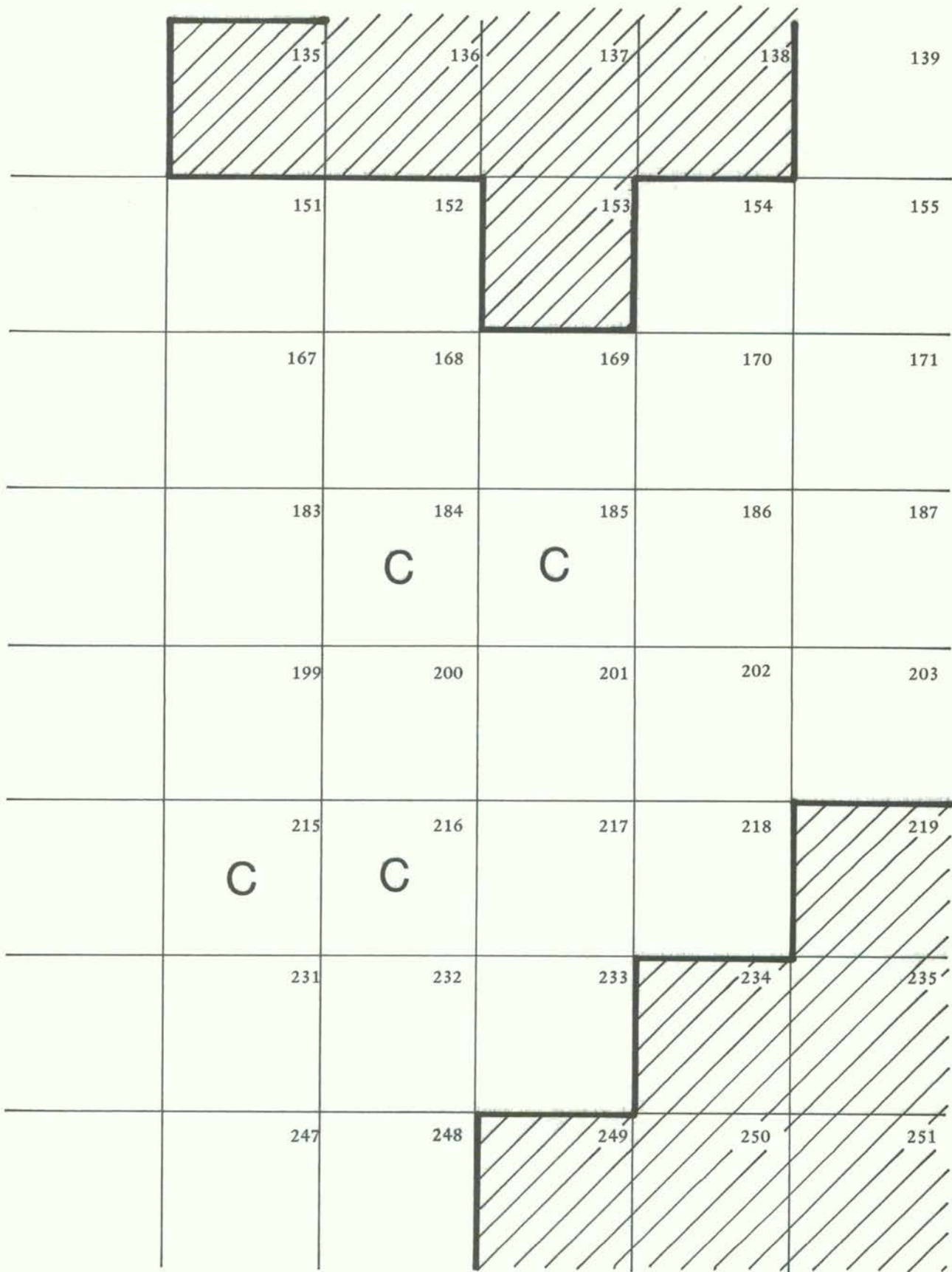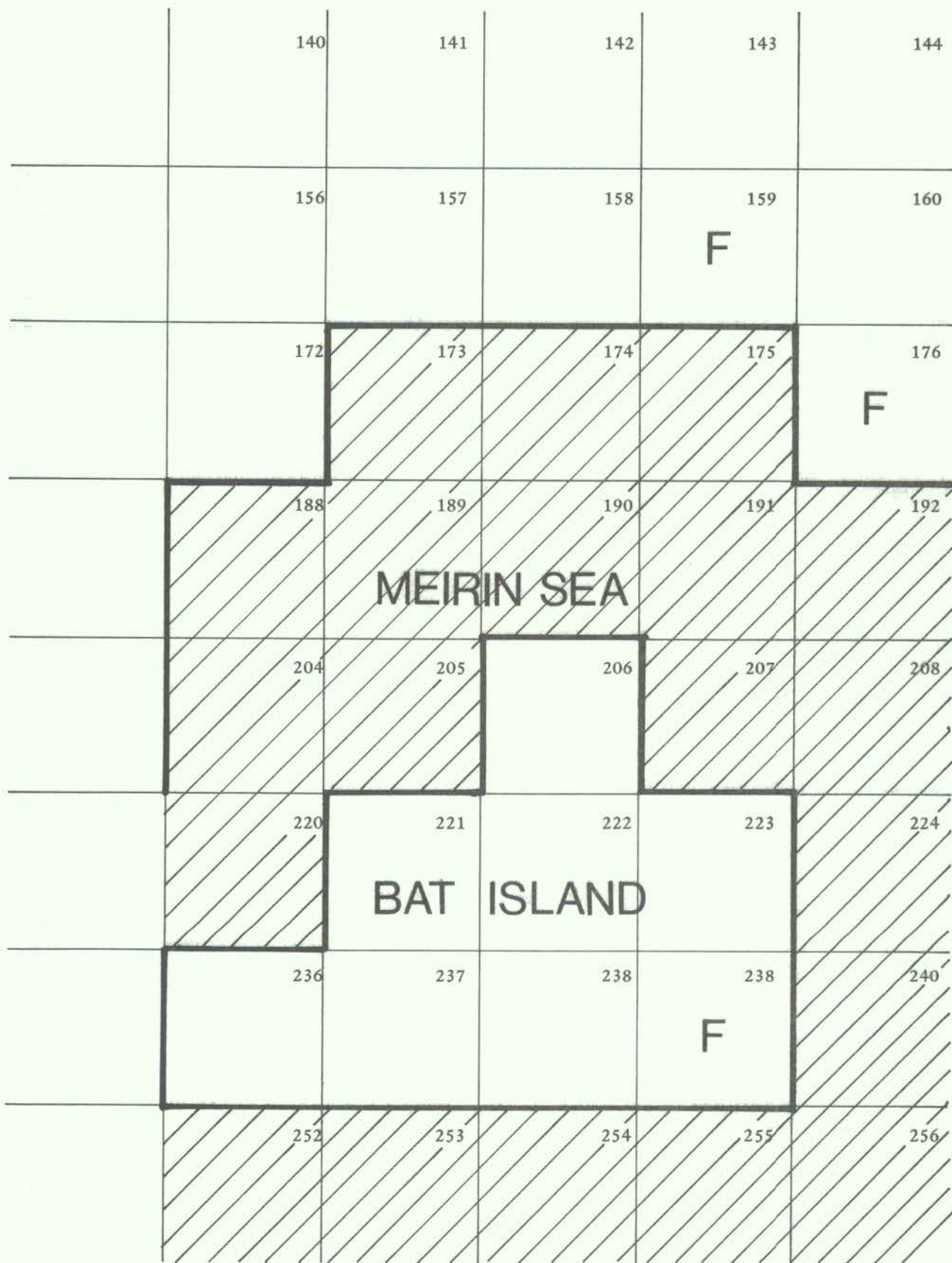
PARTICIPANTS' MANUAL

SHORT ENVIRONMENTAL MANAGEMENT GAME (SEMG)

Contents

1. Scenario

Malapino Community has a population of about 25,000 whose livelihood depends on agriculture, cottage industry, mining and fishing. Cottage industry groups supply exports. Mining is still mostly at the exploration stage, although a few mines have been operating for the past few years on a small scale.

In the Malapino Community there are two basic interacting roles played by:

(a) the CC made up of community leaders, elected by the community. They mainly legislate and formulate policies related to the approval of projects; they release development funds to approved projects whether at community or national level. They authorise community development and funding; and

(b) four sectoral groups that depend for a living on farming, fishing, mining, and producing finished goods. For expansion they look to the government or outside assistance.

This activity is a challenging real life situation in which we plan to acquire what we want: honour, wealth, friends, power, etc. In this activity, your livelihood may be affected by various project proposals.

No data is given; you have to find it from your neighbour(s) or your Community Council. Data is available at the Council table where you may or may not be charged for the information.

You have a small map to help you locate your land unit(s); there is a large zonal map for each sector and for the CC.

One blue chip is initially equal to one unit of land, so you can purchase government or community land. Chips may be equally divided between sub-sectors or owned by the whole sector.

Blue chips are also used to pay for information received and given. They are also used for other transactions, overtly or covertly.

2. Guidelines for sectoral groups

Initial phase

Agriculture   - Rice, coconut, fruit and vegetables (A)
Fishing   - Fish catching (marine), fish farming (F)
Mining   - Coal, copper (M)
Cottage industry   - Bamboocraft, shellcraft and food processing (C)

Each sectoral group has 50 blue chips and 7 land units (indicated by number and a letter, such as number M11 which means land unit number 11, mining area, or number R72 which means land unit number 72 residential area). The units may be divided among the sectoral members, each one-unit area(s) is chosen by agreement or at random (5-7 minutes). The initial land units are marked on the zonal map as follows:

Agriculture: A20-2, A34-6
Fishing: F104, F89-90; F159, F176, F239
Mining: M93-4, M109, M132-3, M149
Cottage industry: C179-80, C184-5, C215-6

You now have your subsectoral unit(s) of land. More than one party may own one or more units of land. You have several minutes to think and write briefly how you see your present economic situation, and how you plan to improve or increase your income (5-7 minutes).

Share your plans with the other members of your group (2 minutes each). Please note that you can use your land unit(s) to exchange or lease, or you can even sell some of the land that belongs to you.

3.   Guidelines for subsectors

1.   You should know the concerns of your subsector and assess your goals
      in the sector.

2.   You may be required to prepare project proposals specific to your
      subsector.

3.   You may need important data when preparing your project proposals.
      This data can be obtained from the CC and you may assume other data.

4.   You may convince your sectoral group that your subsector deserves
      the support and sponsorship of the CC.

5.   You respond to local and national events accordingly.

6.   Even if your proposal is not approved, you can still find ways to
      make your business grow.

7.   As a member of the community, you may have relations with the
      Council or with other sectors.

4. Zonal map (small)
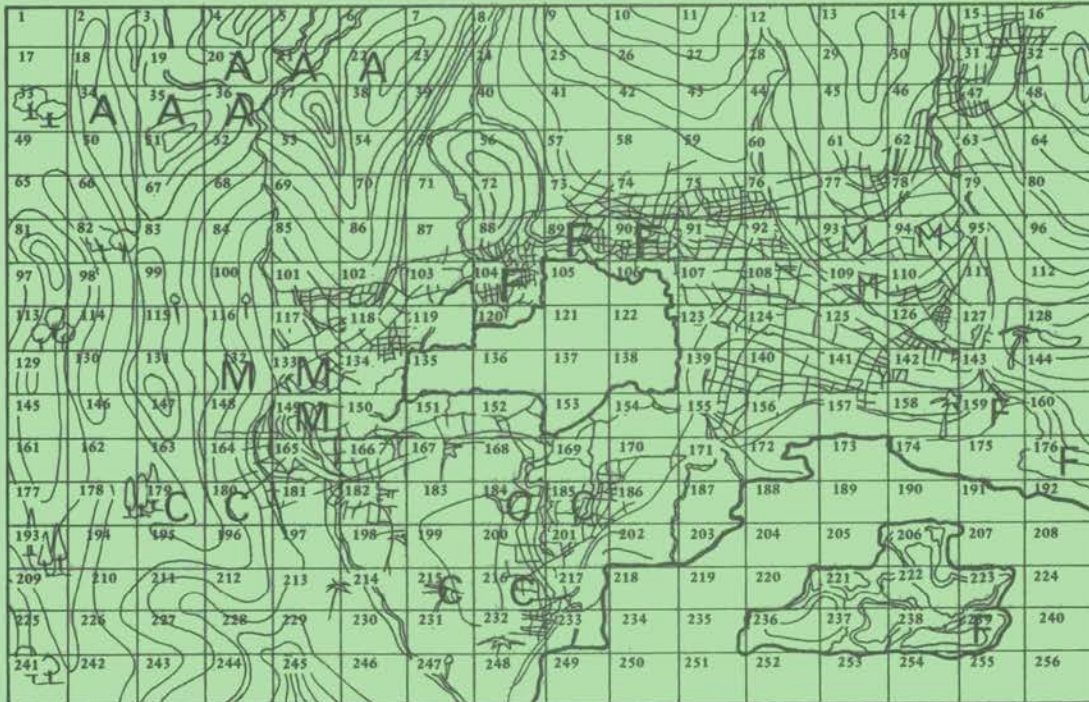
USE OF LAND UNITS and their location as identified by the Government.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
												ADJOINING VILLAGE			
17	18	19	20 A	21 A	22 A	23	24	25	26	27	28	29	30	31	32
33	34 A	35 A	36 A	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89 F	90 F	91	92	93 M	94 M	95	96
97	98	99	100	101	102	103	104 F	105	106	107	108	109 M	110	111	112
113	114	115	116	117	118	119	120	121 LAKE	122	123	124	125	126	127	128
129	130	131	132 M	133 M	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149 M	150	151	152	153	154	155	156	157	158	159 F	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176 F
177	178	179 C	180 C	181	182	183	184 C	185 C	186	187	188	189	190 MEIRIN SEA	191	192
193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215 C	216 C	217	218	219	220	221	222 BAT ISLAND	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238	239 F	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256

Legend
Letter type Of Land

A- Agriculture
B- Cottage Industry
F- Fishing
M- Mining
R- Residential
FR- Forest

☐ - Others/Exploitable

One Square - 1 land unit

5.   Project proposal form

Name of sector: ....

Project/product: ....

Proposed location of project: ....

Justification : ....
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Benefits to the community: ....
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Proposed land units (Nos.): ....
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....

Specific effects on the lake: ....
....

Project proposal form

Name of sector: ....

Project/product: ....

Proposed location of project: ....

Justification : ....
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Benefits to the community: ....
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Proposed land units (Nos.): ....
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6. Land units

Land unit = 1 square

Instruction:
Cut out each land unit (1 square). This will be used to record changes in each land unit as transactions are made, e.g. if the CC passes a bill designating certain vacant land units as mining areas then these squares will be noted and changed on the CC zonal map on the appropriate land unit.

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COMMUNITY COUNCIL MANUAL

SHORT ENVIRONMENTAL MANAGEMENT GAME (SEMG)

Contents

1. Community Council role

2. Guidelines

3. Industrial data

1.   Community Council role

(a) The CC legislates, reviews existing land use, economic and social oriented policies.

(b) The CC makes regular public announcements whenever necessary.

(c) The CC responds to national events or directives and community issues.

(d) The CC sets up policies and criteria for approving project proposals.

(e) The CC releases development funds as directed by the national government.

(f) The CC assesses and approves project proposals with or without funding.

      Note: Any member, in his own private capacity, may interact with and release data to sectoral groups.

GUIDELINES

These guidelines (subject to your amendments)
help the Council perform its functions

1. You may or may not announce some or all of the criteria for approving project proposals.

2. You may decide to finance a project totally or partially with development credits or even blue chips.

3. You can invite representatives of sectoral groups to your deliberations on their proposals.

4. You can call each sector for discussions of possible problems in the long/short term of the project after implementation.

5. You may make any announcement at anytime in relation to your functions.

6. You can sell, lease or buy community owned land units to any sector, subsector or individual member of the community.

7. You may award green chips at any time for environmental concern shown by the groups.

8. Community Council capital

    Credit unlimited
    Blue chips (cash) – 200
    Land (all unallocated units)
    Green chips – 50 (confidential rewards for environmental
    concern – the significance of green chips is not to be revealed
    by anyone to the sectoral groups until the end of the game!!)

9. Time factor deliberations (can be made shorter)

    Criteria of proposals and projects   10 – 15 minutes
    Proposals   20 – 30 minutes
    Meetings with all sectors   20 minutes maximum

10. Chips – one blue chip is equal to one land unit value for CC owned
    land.

    Information you give (excluding criteria for project proposal) is at
    your disposal to change.

11. The zonal map is used to locate land units of sectoral groups.

12. The industry data sheet contains some data the sectoral groups may
    need to complete their project proposals; data can be sold to groups
    for blue chips or given away; data may be evidence for awarding
    green chips.

INDUSTRY DATA

The Community Council may provide these data to the
different sectors when asked

1. Cottage industry sector

(a) Bamboo craft industry data:

   - Increasing demand specifically in the export sector has been
     observed in the past two years. Bright future this year
     projected.

   - Due to scarcity of raw materials, production levels could not
     cope very well with the existing demand.

   - Competition from other cottage industry sectors is growing.

   - Has a good record as labour and employment generator in the
     community.

   - Foreign market and local market.

(b) Shell craft industry data:

   - Industrial market is both local and foreign.

   - Due to its export potential this industry offers high profit
     potential.

- This industry generates much employment.

- Export demand has been increasing in the past two years.

- Capital requirements to run the industry are low.

- Seasonal availability of raw materials hampers production.

- Stiff competition from other cottage industry products is foreseen.

- This industry's production in the past six months has been low.

(c) Food processing industry data:

- Local market is increasing fast.

- Trends show very good profit potential.

- Industry needs only a small amount of capital.

- Employment generation is unclear.

- Industry is threatened by scarcity of raw materials.

- Target markets are the local and nearby communities.

- Production of processed food products is inadequate to supply the market.

2. <u>Mining sector</u>

(a) Copper mining industry data:

  - World market demand is high.

  - Presently industry faces low risk considering world market
    demands.

  - Demand is much higher than production.

  - Markets are the foreign countries.

  - High capital requirements to run the industry.

(b) Coal mining industry data:

  - Poor technology characterizes the industry.

  - Market supply is low.

  - Market is local. Community is the main beneficiary, however,
    it has also some export potential.

  - Due to high and escalating cost of oil the demand for coal has
    increased.

  - Industry needs high capitalisation in order to grow.

  - High rate of return is foreseen.

3. Fish sector

(a) Fish farming industry data (fresh water):

- Gradual increase in demand for fresh fish is expected.

- Production is insufficient to meet demand.

- Industry risks mostly due to natural calamities such as typhoons. Water pollution poses high risk.

- Substantial capital needed. The industry needs trained technical personnel, mostly fishery technicians.

- Tie-up with cottage industry sector (shellcraft) of great help to the industry.

- Very low employment generation.

(b) Fish catching (marine) industry data:

- Low employment generation.

- High capitalisation needed by the industry.

- Gradual but steady increase in demand is expected.

- Local market.

- Current production outputs inadequate to supply the market.

- Profit is good compared to other agricultural industries.

4. Agricultural sector

(a) Rice industry data:

- Industry has always maintained a good profit margin.

- Employment generation is low.

- Main risks to the industry are weather, plant disease and lately, environmental pollution.

- Currently rice production is equal to consumers demand.

- Rice is always in high demand.

- Capital requirements remain average.

- Market remains the local communities.

(b) Multi-agri industry data:

- Market remains mainly the local and adjoining communities.

- Employment generation is low.

- Industry needs only average capital requirements.

- Production cannot cope with present market demand.

(c) Fruit and vegetable industry data:

- Industry is susceptible to climatic conditions, pests,
   environmental imbalance.

- Good profit margins.

(d) Coconut industry data:

- Industry has been traditionally the highest labour generator in
   the community.

- Industry has high profit potential. Coconut-derived products
   however are gradually being challenged by synthetic substitutes.

4

ENVIRONMENTAL MANAGEMENT GAME

Appendix

International Labour Office Geneva

DETAILED DESCRIPTION OF ENVIRONMENTAL MANAGEMENT PROGRAMME MATERIALS

BOOK 1: GENERAL ENVIRONMENTAL MANAGEMENT (5 UNITS) — intended for managers, supervisors and students from public or private enterprises or development projects of a general nature which may have some impact on the physical or social environment. The typical learner will have some work experience but little previous training in environmental management.

G.1 Environment and Enterprise Objectives

- Relates the basic goals of the enterprise to environmental management.
- Examines the tools and goals of environmental management and its importance.
- Introduces the concepts and language (glossary) of environmental management.

G.2 Scope and Structure of the Environment

- Examines the economic and ecological views of environment.
- Illustrates the services and functions of environment.
- Analyses different types of environmental conflict.

G.3 Interaction: Nature, Society and the Enterprise

- Examines the roles of individuals and groups in a country.
- Relates the natural environment to the socio-economic environment.
- Illustrates the role of the enterprise in the total environment.

G.4 Environmental Impact Assessment (EIA)

- Demonstrates the four steps to activate EIA.
- Uses a basic matrix to perform simple environmental assessment.
- Analyses EIA and its functions.

G.5 Pollution Prevention Pays

- Discusses the benefits of preventive versus retro fitting measures.
- Opens enterprise awareness to new technologies enabling the enterprise to be more profitable and less polluting.
- Demonstrates the results of pollution prevention programs, and how selling company know-how and waste products may open new markets and profit centres.

BOOK 2 - PROJECT MANAGEMENT AND THE ENVIRONMENT (3 UNITS) - for project managers, supervisors and students involved in development projects which may have some impact on the physical or social environment. The typical learner will have three to five years practical experience; some environmental management experience is desirable.

PM.1 Project Development

- Develops knowledge, skills and attitudes regarding project design and the environment.
- Uses EIA (Environmental Impact Assessment) in project design Involves the learner in assessment and planning for environmental impacts.

PM.2   Project Implementation

- Deals with a variety of environmental impacts during
  implementation.
- Involves the learner in solving challenges of the project.

PM.3   Project Monitoring and Environmental Evaluation

- Demonstrates how proper monitoring effects overall project
  evaluation.
- Analyses the environmental impact and evaluation
  process that follow projects.

BOOK 3 – PRODUCTION MANAGEMENT AND THE ENVIRONMENT (4 UNITS) – for
production managers, supervisors and students from public and private
enterprises involved in production activities which may have some impact
on the physical or social environment. The typical learner will have
three to five years practical experience; some environmental management
experience is desirable.

PDM.1 Production Management and Environment

- Analyses the key responsibilities of the production manager and
  in
  relation to the environment.
- Develops the organisational structure for efficient and
  effective
  environmental management.

PDM.2 Product Design

- Demonstrates how environmental management begins with an EIA of proposed new products as an influence on product design.
- Analyses alternatives for product design and their short-term and
  long-term influences on environmental issues.

PDM.3 Technology Choice

- Relates technology choice to the short and long-term effects on the
  environment.
  Focuses on technology choice as related to environmental as well as
  technical and financial criteria.

PDM.4 Waste Management and Design of Production Systems

- Assesses environmental impacts of production systems.
- Analyses practical production system problems and their complex effect on environment.

BOOK 4 - ENVIRONMENTAL MANAGEMENT GAME - for policy makers, project managers, environmental planners, enterprise managers, community based workers, trainers, members of a community, etc.; to develop awareness and understanding of the need to give equal importance to the political, social, cultural, physical, economic, techological environments at every phase of project or production activities.

This is a four to six-hour simulation exercise with conflicting interest groups seeking goals of profit, growth and survival, in the face of difficult environmental impact conditions. Materials include a manual for participants and a separate trainers' guide.

BOOK 5 - SUPPORTING ENVIRONMENTAL MANAGEMENT TRAINING MATERIALS - including: Instruction for the organiser, Standard course diary, Diagnostic instrument, Technical note on FLP methodology, etc.

Instructions for the organiser

Detailed explanation for the trainer and technical specialist who uses FLP materials; demonstrates how FLP materials may be used in a variety of ways from direct teaching to total group participation. Provides technical specifications for designing FLP materials and adapting them to local conditions. Step-by-step instructions on how to use each unit (20 pages).

Standard course diary

Manual for each trainee including; description of FLP, registration form, learner feed-back form, action planning routine, etc.

Diagnostic instrument

Alternative choice quiz of 80 questions on the whole training materials which may be used before or after training activities.

Technical note on FLP methodology

Detailed explanation of FLP technology, application and availability from the ILO in both environmental management and other areas of management training.

Note: Manual: Introduction to environmental management (published separately) by Professor Michael Royston, recognised international expert and consultant to the ILO/UNEP project in the field. This should be available in late 1985 or early 1986 and will include chapters on environmental management and training, environmental issues for industrialised and developing countries, the managerial response, profiles of the responsive organisation in terms of policies, efforts and organisational structure, projects, products and production, the environmental dimensions of management such as production, management, project management, marketing, personnel, finance, corporate planning, R & D, engineering and design, top management, and, finally, an action plan for managers.

4

ENVIRONMENTAL MANAGEMENT GAME

Basic glossary

International Labour Office Geneva

BASIC GLOSSARY

ACID RAIN

Rain polluted by sulphur and nitrogen-based acids from combustion processes which damages lakes and forests.

ADD-ON

Practice of "adding-on" a pollution control plant at the end of a dirty process.

AEROBIC BACTERIA

Micro-organisms which live only in the presence of free oxygen.

AIR POLLUTION

This can be divided into particulate and gaseous pollutants. Particulate pollutants consist mainly of dust and smoke. Gaseous pollutants are caused by the burning of fuels (wood, oil, coal) and consist mostly of sulphur oxides, nitrogen oxides, carbon monoxide etc., and also from industrial processes.

AIR POLLUTION INDEX

An index based on the concentration of sulphur dioxide (SO_2), carbon monoxide (CO), dust particles, and hydrocarbons.

ALLOCATION OF RESOURCES

Division of scarce resources between various users to attain optimum benefits for all.

ANTI-KNOCK ADDITIVES

Substances that give evenness of fuel combustion in internal combustion engines. Contain mainly organic lead compounds (tetra-ethyl lead).

ATMOSPHERE

The mass of air surrounding the Earth, consisting of several concentric layers such as the troposphere, stratosphere, mesosphere and ionoshpere.

BACKGROUND REPORTS

Report on pre-project pollution levels.

BIOCHEMICAL OXYGEN DEMAND (B.O.D.)
The amount of oxygen that is needed for biochemical oxidation of organic pollutants in water.

BIODEGRADABLE
Substances that can be decomposed through biological processes.

BIOMASS
All material of vegetable and animal origin produced through biological processes.

BIO-PHYSICAL
That part of the environment of encompassing living species and their physical surroundings.

BIOSPHERE
That part of the Earth's surface, including the ocean, the atmosphere which supports life.

B.O.D.
See Biochemical Oxygen Demand.

CATALYST
Substance which produces a chemical reaction in other bodies without undergoing change itself.

CONVECTION
Transportation of heat by the movement of hot gases or liquids.

COST-BENEFIT ANALYSIS
Analysis of total quantifiable costs and benefits of a project to society as a whole.

CYANIDE
Toxic compound of two radicals each consisting of one atom of nitrogen and one of carbon.

DDT
Synthetic insecticide from the chlorinated hydrocarbons group used mainly for agricultural purposes and for malaria control. It resists biodegration, and therefore can be harmful to the biosphere if used without due precaution.

DECIBEL
A unit of intensity of sound.

DENITRIFYING BACTERIA
Bacteria which break up nitrogen compounds.

DE-SALINATION
Process to remove salt from sea water.

DESERTIFICATION
Transformation of productive land into desert.

DETRIMENTAL
Damaging, harmful.

DEVELOPMENTAL GOALS
The intention of raising the total level of human well-being.

DIRECT TECHNOLOGY TRANSFER
Conveying knowledge directly from an existing user in one part of the world to a potential user in another part.

ECOLOGY
The study of relationships between living organisms and their environment.

ECO-SYSTEM
A collection of living organisms, their necessary resources and their habitat, and their interaction in a self-contained and sustainable manner.

ECOSYSTEMS
Organisation of relationships of living organisms within a given natural environment.

ENERGY RESOURCES
Sources of fuel (both renewable and non-renewable).

ENVIRONMENTAL IMPACT ASSESSMENT(EIA)
The assessment, before the decision to implement a project, of the impact the project would have on the environment if it were to be implemented.

ENVIRONMENTAL MANAGMENT

Management of activities within tolerable constraints imposed by the environment itself, and with full consideration of ecological factors; management of the enterprise to achieve survival, profitability, growth and social responsibility; essentially preventive rather than retro-fitting.

ENVIRONMENTAL PLANNING

Planning for the use of environmental resources on a sustainable basis.

ENVIRONMENTAL RESOURCES

Resources of land, water, air, flora and fauna.

EROSION

The loss of soil by winds and water.

EUTROPHICATION

Accelerated aging of lakes through build up of organic residues caused by over fertilization.

EXTERNALITY

The cost or benefits occurring to parties other than the supplier and the purchaser of an economic transaction.

FEASIBILITY

Economic and technical viability of a project.

FEEDSTOCK

Raw material for chemical synthesis.

FERTILIZER

Organic or inorganic compounds used to make the land more productive.

FOOD CHAIN

See Metabolic Chain.

FOSSIL FUEL

A source of non-renewable energy such as oil, gas and coal resulting from the "fossilization" of biomass.

FUEL CELL
> A device for producing electrity directly from the chemical reaction between hydrogen and oxygen.

GATEKEEPER
> A member of a community who channels information and opinions.

GEOTHERMAL ENERGY
> Energy derived from hot zones beneath the earth's surface or in geologically active areas.

GASEOUS ATMOSPHERIC POLLUTION
> Pollution from the burning of fossil fuels, industrial emissions etc. It can cause intoxication, bronchitis, asthma, emphysema and other respiratory illnesses.

GREENHOUSE EFFECT
> Heating of the atmosphere due to the trapped solar energy as a result of a rise in the carbon dioxide concentration of the atmosphere.

GREEN REVOLUTION
> Increases in food outputs from high-yielding varieties of seeds which require a combination of irrigation, fertilizers and pesticides.

HERBICIDES
> Chemicals used to kill plants.

HUMAN SETTLEMENTS
> Cities, towns and villages.

HYDROCARBONS
> Chemical compounds composed of hydrogen and carbon; the largest source of hydrocarbons is oil.

HYDROSPHERE
> The water portion of the earth's surface as distinguished from the solid part (lithosphere) and the gaseous layer (atmosphere).

IMPLEMENTATION
> The realization - construction and setting in operation of a project.

INDUSTRIAL WASTE
Solid residues from industrial processes.

INFRASTRUCTURE
The physical basis of social services.

INORGANIC COMPOUNDS
Substances that do not contain carbon as their principal element.

INSECTICIDES
Chemical agents that destroy insects.

INTEGRATED CONTROL
Ecological pest management with the combined use of all possible means.

IONIZING RADIATION
Radiations emitted by radio-active substances or apparatus, with sufficient energy to produce ionization directly on their passage through a substance. Can destroy living cells.

LAND USE
Allocation of sectors of land that are restricted from certain activities. Thus certain areas would be reserved for industries while other areas would be reserved for habitation.

LITHOSPHERE
The solid part of the earth's surface.

LOW-SULPHUR FUEL
Fossil fuels from which sulphur has been removed.

MALARIA
Parasitic mosquito borne disease.

MANURE
Animal excreta after aerobic fermentation, used as fertilizer.

MAXIMUM PERMISSIBLE DOSE
The dose of a toxic agent that a person may receive over a specific time without appreciable bodily injury.

MEGALOPOLIS
    Very large metropolitan urbanized zone.

METABOLIC CHAIN (also Food Chain)
    The sequence of consumption of lower organisms by higher organisms.

METEOROLOGY
    The science of the atmosphere and its phenomena.

METHANE
    A colourless, odourless, inflammable gaseous hydrocarbon, chief
    component of natural gas.

MICROGRAMME
    One millionth part of a gramme.

MINERAL RESOURCES
    Mineral deposits of an area that are potentially recoverable.

MITIGATE
    Reduce severity (of impacts) by modifying a project or its location.

NATURAL GAS
    A combustible, gaseous mixture of hydrocarbons found in association
    with crude oil or in separate deposits.

NATURAL SYSTEMS
    Stable interacting collection of non-man-made physical and or
    biological entities.

NITRITE
    A salt or ester of nitric acid.

NITROGEN OXIDES
    Laughing gas.

NITROUS OXIDE
    Oxide of nitrogen used as a propellant.

NUTRIENT
    Substances which provide nourishment for plants.

ORGANIC SUBSTANCE

Substances based on molecules having a carbon skeleton, usually originating from biomass.

OUTFALL

Point of discharge of waste water.

OUTPUT

Production.

OZONE

Gas containing three molecules of oxygen, a powerful oxidant. An ozone layer above the earth absorbs dangerous ultra violet radiation. In the lower atmosphere, it is involved in producing photochemical smog.

PARASTATAL

An institution or body which takes on some of the roles of civil government or political authority; an agency through which the state works indirectly.

PARTICULATES

Fine solid particles which remain suspended in gases, particularly air.

PERSISTENT INSECTICIDES

Non-degradable insecticides, such as DDT.

PHOTOCHEMICAL SMOG

Chemical pollutants in the atmosphere resulting from chemical reactions involving hydrocarbons and oxidants in the presence of sunlight.

PHYSICAL PLANNING

Land use and infrastructure planning emphasising the need for providing a balanced economic development and conserving resources.

PNEUMOCONIOSIS

Debilitating or fatal lung disease caused by the inhalation of mineral dust.

POLLUTANT

Substances that damage the quality of the environment.

PRODUCTIVITY

A measure of the physical output resulting from the use of human or natural resources.

RAW SEWAGE

Untreated municipal waste waters containing human excreta, etc.

RECYCLING

The recovery and reuse of materials from scrap or other waste materials.

RESOURCE-INTENSIVE

Activity (usually human) requiring large input of natural resources.

RETRO-FITTING

Environmental management of the enterprise which fails to prevent environmental damage; must expend resources later for corrective measures.

RESOURCE INVENTORIES

Exhaustive listing of resources.

SCHISTOSOMIASIS

Disease caused by parasitic fluke transmitted by a water snail.

SECONDARY SEWAGE TREATMENT

Process whereby sewage, after being screened, is subjected to aerobic treatment methods to dissolve organic pollutants.

SEMI-ARID REGION

Region with very low rainfall.

SMOG

Air pollution consisting of smoke and fog.

SOCIAL COSTS

The quantitative and qualitative burden imposed on society by a given activity.

SOCIO-ECONOMIC

Income and social position considered as a single factor to measure a family or an individual's status in a community.

SULPHUR DIOXIDE
Air pollutant arises from the combustion of sulphur in fuels. Above certain concentrations it is a respiratory irritant; during airborn transportation it can convert into an acid precipitated as "acid rain", damages crops, forests, lakes and structures.

SYNERGISTIC
Co-operative action of various forces such that the total effect is greater than the sum of the two or more effects if the action was taken independently.

TERTIARY SEWAGE TREATMENT
Third stage of sewage treatment, where chemical compounds are removed.

TETRAETHYL LEAD
A highly toxic lead compound that, when added in small proportions to gasoline, increases the fuel anti-knock quality.

THERMAL INVERSION
Entrapment of cold air and pollutants below a stable layer of warm air.

THERMAL POLLUTION
Heating of water bodies caused by the discharge of warm water from industrial cooling systems.

TONNE
One thousand kilogrammes.

VECTOR HABITAT
The place where an organism, which transmits a disease, normally lives.

VULNERABILITY OF ECOSYSTEMS
Fragility of the ecosystem to mismanagement.

ZONING REGULATIONS
Regulations designed to control land use for specific activities (industrial, residential, nature reserves etc.).

environmental management training

Economic development and technological progress can be compatible with reasonable protection of the environment. New environmental management techniques are in use around the world, helping enterprises to meet their objectives of profit, growth and survival, while protecting the environment.

A series of training materials in environmental management has been developed to support environmental management training in enterprises, training centres and institutes, universities, business schools, projects, etc. The series was produced and tested by the Management Development Branch of the International Labour Office for the United Nations Environment Programme (UNEP) in collaboration with several management institutions. The project team was co-ordinated and the materials edited by Dr. R.G.A. Boland of the ILO.