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NATIONAL ENVIRONMENTAL EDUCATION COMMITTEE

ENVIRONMENTAL ACTION PROGRAMME

Create an Environment for Clean Living.

AN Environmental Steward's HANDBOOK

An Environmental Steward's Handbook

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T

Threatened species: Species that are likely to become endangered in the foreseeable future if the factors causing numerical decline or habitat degradation continue to operate.

V

Values: Ends or ideals which are held by a person. They are central to attitudes and to some of our beliefs. Values are not absolute. They are the standards or codes which direct our actions. (King, R. et al. (2000). *Social studies through discovery (Rev. ed.)* Kingston, Jamaica: Chalkboard Press, JBTE-MPU. Longman)

Vision: A written statement or "picture" of what people expect their society, community or organisation to look like and accomplish at some future time.

W

Watershed: An area of land from which water percolates into the soil to emerge at a lower level as a river or stream. Runoff water also may carry soil and dissolved substances into the river and its tributaries. Adjoining watersheds are separated from each other by high ridges (hills/mountains).

Glossary of terms adapted from:
Foster-Allen, E., J. Glasgow & J. HoLung (2002). *Handbook for leadership development in environment education for sustainable development (Draft).* Kingston, Jamaica: NEEC.

TABLE OF CONTENTS

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Thanks also to the Joint Board of Teacher Education, the National Environmental Education Committee Secretariat and the ENACT Programme that contributed human, material and financial resources to the STEEP. Gina Sanguinetti, Director, and Michael Myles of the NEEC Secretariat rendered invaluable assistance in producing this handbook. We also thank the two reviewers who gave constructive comments for improvement.

We hope that the handbook inspires you and your advisors to begin and sustain a successful stewardship programme at your institution.

Organism: Any living thing.

P

Population: A group of interbreeding organisms occupying a given area, habitat or space.
Precautionary principle: Where there are threats of serious or irreversible harm to human health or the environment, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (*Adapted from, Principle 15 of the Rio Declaration on Environment and Development, in Agenda 21. UN Conference on Environment and Development, 1992*.)
Problem: A goal where the correct path to its solution is not known. (*http:///.PBLI.org/3core.htm)*
Problem-based learning: Curriculum development and delivery system that recognizes the need to develop problem solving skills as well as the necessity of helping students acquire necessary knowledge and skills. *(Internet classrooms http://score.rims.K12.ca.us/problearn.html)*

R

Re-cycling: The collection and re-processing of manufactured products for re-use either in the same form or as new products, by recovering the resources contained in the original materials.

S

Stewardship: The wise use of resources to provide a healthy, more efficient and sustainable working environment.
Sustainable development: Integrating the needs of ecological protection, social development and economic opportunity into all decision-making to meet the needs of present and future generations.
Sustainable lifestyle: A lifestyle that allows for the continuing, careful use and enjoyment of resources.
Systems thinking: A way of thinking where the primacy of the whole is stressed, and the inter-relatedness of the components. Any change in one aspect affects the other, so sensitivity to changes in the environment is crucial.

I

Imbalance: A condition in which the environmental equilibrium is upset or disturbed, with possible negative effects, if not corrected.
Interaction: The effect created when different parts of the environment – natural, man-made, living, non-living – act on each other.
Interdependence: The way everything depends on everything else – a sense of inter-connectedness and mutual effect.
Issue: a point in question; the subject of a discussion or debate.

L

Leadership: Traits/skills that focus on building an organisational culture, doing things right and on the long term vision.
Learning organisation: One that can maintain or improve performance based on experience. It operates on a shared vision, where team work and the good of the organization are stressed, as well as on-going, individual personal development
Limits: the finite boundaries of resources.

M

Management: Traits/skills that tend to focus on building organisational structure, on "doing things right", and on the "here and now".
Mangrove: Species of plants able to grow in salty/brackish wetlands.
Morals: Accepted rules and standards of behaviour dealing with relationships between people.

N

Natural Resource: The sources in nature on which human beings and other living things rely for their needs – food, clothing, shelter, growth, recreation.
Niche: The role and activities of a living organism within a community.

O

Introduction

This Environmental Stewards Handbook is designed to assist you to function as stewards at your educational institutions. It outlines the knowledge and skills needed for you to take responsibility and to ACT to ensure that your school implements a successful stewardship programme. In so doing, you will be playing an important role in Environmental Education for Sustainable Development (EESD).

EESD involves

- understanding the consequences of human actions for the earth and its resources;
- understanding decisions and actions that can be taken locally and globally to encourage sustainable living and avoid unsustainable practices;
- taking personal responsibility for living in a sustainable way.

One key dimension of EESD is stewardship. In an individual sense this means taking responsibility and action to ensure that your community becomes a better place to live in through the efficient use of resources and through measures to improve safety and prevent pollution.

We hope this handbook provides you with useful information. We would appreciate your comments on its contents and organisation, which you could send to the Joint Board of Teacher Education or the National Environmental Education Committee Secretariat (see Appendix 5 for contact addresses).

Marceline Collins-Figueroa Janice HoLung

Roles & Functions of Environmental Stewardship

Who is an Environmental Steward?

A person who is responsible for ensuring that the stewardship goals of the school are met and that practices are maintained regarding the sustainable use of school resources.

As an Environmental Steward what are your goals?

1. Becoming a more aware person and taking personal responsibility for environmental matters in your school.
2. Improving the level of environmental awareness throughout the school community.
3. Working towards and maintaining wise and efficient use of school resources and preventing pollution.

As an Environmental Steward what are your roles and functions?

- To monitor the use of energy and water in dormitories, classrooms and other areas of the campus
- To assist in regulating the sorting and disposal of garbage
- To be good practitioners of EESD, practicing the three R's – Reduce, Re-use and Recycle
- To ensure that students do not abuse the natural environment – lawns, plants and trees on the campus
- To monitor the use of radios and other sound devices on campus
- To monitor the use and care of your buildings, furniture and equipment on the campus
- To encourage the practice of environmentally friendly purchasing across the campus

E

Ecology: The study of how living things relate to each other and to the world around them.
Ecosystem: Living organisms and their non-living surroundings in a particular area/habitat, interacting with each other and with the habitat to form a self-sustaining natural system.
Endangered species: Species in danger of dying out throughout all or part of their habitat and whose survival is unlikely if the factors jeopardizing them continue to operate.
Endemic: Species found in a particular area/country and nowhere else in the world.
Environment: The totality of all the linked factors that influence living things: the physical, biological, social, economic, political, cultural, technological and spiritual contexts of life.
Environmental audit: An assessment of the status of environmental policies, practices and controls.
Environmental education for sustainable development: An educational process to help people become more aware of and concerned about the environment and to be committed to maintaining a balance between quality of life and quality of the environment.
Equilibrium: A state of balance in the environment maintained by interaction among all its elements and contributing to environmental health.
Ethics: Individual character or set of moral principles of a person. A personal moral code.

F

Food chain: A sequence of organisms in any natural community in which each member feeds on the one before in the sequence and is in turn eaten by the one after.

H

Habitat: The place where an organism lives.

Appendix 6
Glossary of Environmental Terms

A

Afforestation: replanting trees in a habitat.
Algae: Simple plants, lacking stems and leaves, usually living in water.
Aquatic organisms: organisms growing or living in water.
Attitudes: are directly derived from values. They are feelings expressed as preferences, as likes and dislikes, as approvals and disapprovals. An attitude may/may not lead to actions. (King, R. et al. (2000). *Social studies through discovery (Rev. ed.)* Kingston, Jamaica: Chalkboard Press, JBTE-MPU. Longman)

B

Bacteria: very small (microscopic) living things. They are important in nature, e.g., some break down organic matter in water and soil; others cause diseases such as diarrhoea and cholera.
Bio-degradable: Any material which can be decomposed (broken down into simple, stable compounds) chemically or physically by micro-organisms.
Biodiversity: The variety of all plants, animals and micro-organisms existing within a particular area (habitat or ecosystem) on earth.

C

Carrying capacity: The maximum number of living things that can be supported indefinitely by a given ecosystem, area or habitat without deterioration.
Community: A group of people or other living organisms defined by one or more of the following: ecological systems, administrative systems, geographical areas, culture, interests.

D

Deforestation: The removal of trees from an area/habitat.

- To encourage other students to use conflict resolution skills where possible
- To be eager to educate and communicate about the EESD initiative to others
- To be proactive in matters of an environmental nature
- To report persistent behaviours that seek to undermine the sustainability of the environment
- To serve a committee established to implement the Action Plan of the institution

(Ideas credited to Shortwood Teachers' College Stewards' Group.)

"As a result of the programme, our daily behaviour has changed a lot. We conserve all types of materials and money ... I think this is a process that will benefit myself, the institution where I am from, and my country,"

- Meoda McLean, Church Teachers' College

Three areas of focus for stewards are management, monitoring and communication.

ENVIRONMENTAL MANAGEMENT	MONITORING PROCEDURES	COMMUNICATION
Know the environmental policy of the school.	Periodically inspect environment in particular zone assigned.	Demonstrate inter-personal communication skills.
Know the school plant/campus.	Monitor use of water, electricity, paper and waste disposal areas. Look at resource allocation and use.	Project professional image. Be consistent in behaviour, be knowledgeable and unbiased in your talks with others.
Identify and be knowledgeable about the following in the zone to which you are assigned: water and electrical outlets, electrical lights.	Complete and submit checklists in timely manner.	Maintain communications within your stewards' group and with school administration.
Participate in action planning.		Provide information to other students.
Assist in stewardship studies and data collection.	Record breaches and complaints.	Investigate complaints, and conduct interviews when appropriate. Quietly find out the facts on a "one to one" basis.
Learn safety procedures and first aid.	Act where possible or necessary.	Develop and use information sources to improve situations.
Provide information to administration and make recommendations.	Recommend course of action.	Understand confidentiality in communications.
Manage stressful situations.	Respond to complaints and breaches.	Assess and control potential confrontation.
Maintain your physical fitness and keep in good mental health.		

46. St. Ann Environment Protection Association (STAEPA) (See Northern Jamaica Conservation Association)

47. St. Elizabeth Environmental Protection Association (SEEPA), 2 High Street, Hendricks Building, Black River St. Elizabeth, 634 3824, seepa@mail.infochan.com

48. St. Thomas Environmental Protection Association (STEPA), c/o RADA, P.O. Box 46, Morant Bay, St. Thomas, 982-2205, stepa2@yahoo.com

49. University of the West Indies, Mona, Kingston 7, 927-1660, www.uwimona.edu

50. Urban Development Corporation, 12 Ocean Blvd., Kingston, 922-8310.

Some organisations in Jamaica that collect products and materials for recycling.

1. Cable & Wireless Jamaica Limited – telephone directories 926-9700 or 1-888-225-5295

2. Minott Services Limited – corrugated cardboard 926-3360

3. Garbage Disposal & Sanitation Services (GDSS) - old newspaper, cardboard boxes, glass bottles (clear & brown) 901-2414

4. Premier Waste - corrugated cardboard, bond paper 960-6351 or 906-3094

5. The Shell Company – industrial waste oil, telephone directories 928-6509 or 928-7301

33. National Water Commission, 28 Barbados Ave., Kingston 5, 929-5430, www.nwcjamaica.com

34. Natural History Society of Jamaica, c/o Department of Life Sciences, University of the West Indies, Mona Kingston 7, 977-8007, naturalhistory@hotmail.com

35. Negril Area Environment Protection Trust (NEPT), PO Box 2599 Negril, Westmoreland, 957-3736, nept@infochan.com

36. Negril Chamber of Commerce (NCC), PO Box 55 Negril, Westmoreland, 957-4591, negrilchamber@cwjamaica.com

37. Negril Coral Reef Preservation Society (NCRPS), PO Box 2725 Negril, Westmoreland, 957-4626, coralreef@cwjamaica.com

38. Northern Jamaica Conservation Association, PO Box 212, Runaway Bay, St. Ann, 973-4305, njca@anngel.com.jm

39. Office of Disaster Preparedness and Emergency Management, 2 Camp Rd., Kingston, 928-5111, www.odpem.org.jm

40. Pesticide Control Authority, 2 King St., Kingston, 967-092

41. Portland Environmental Protection Association (PEPA), 6 Allan Avenue Portland, 993-9632, pepa@cwjamaica.com

42. Rural Agricultural Development Authority (every parish), www.radajamaica.com.jm

43. Sanitation Support Unit (SSU), c/o Construction Resources and Development Centre, 11 Lady Musgrave Avenue, Kingston 5, 940-2935

44. Social Development Commission, 12 Ocean Blvd., Kingston, 948-0562, www.sdc.gov.jm

45. Southern Trelawny Environment Agency (STEA), Albert Town P.O. Trelawny, 610-0818, stea@cwjamaica.com

A Stewardship Programme

In terms of a school or college, environmental stewardship entails the wise use of resources to provide a healthy, more efficient and sustainable working environment. A stewardship programme should be put together by a group that is representative of all stakeholders in the school or college. i.e. administration, staff and students. Such a programme should have clearly stated policies and goals, as well as operational details.

Some guidelines for the establishment and operation of an overall school
programme as well as a stewards' group are set out below.

"In going about my daily tasks I see to it that lights are turned off where not needed, where there is a pipe left running, it is turned off. I report any faults to my supervisor or the plant manager."

- Maisie Murdoch, Shortwood Teachers' College

A. Getting a Whole College Stewardship Programme Started

1. Review operations, collect baseline data and envision improvements

- Carry out a needs analysis. Look at the current conditions and practices. Look at such things as the state of the buildings, water availability and use, equipment, how the grounds are kept, the green cover of the grounds, state of playing fields, arrangements for nutrition, waiting areas for transportation, use of energy, waste disposal, sanitary conveniences, etc.
- Evaluate the status of environmental awareness programmes in the school.
- Gather all the baseline data possible. The more informed you are on 'what is', the better you can decide 'what should be' and therefore how you can get there.
- Prioritise the needs.
- Based on the data, envision desirable improvements.
- Set these as **goals,** paying attention to urgency. Emphasise the wide environmental benefits of such a programme, for example the economic, health and spiritual benefits.
- Identify resources: human, financial and material.

2. Communicate ideas to the school and wider community

- Expose and discuss the ideas publicly to garner support and get suggestions. This is an initial sensitisation activity. Stress the idea of 'one earth' to be protected.

21. Jamaica Tourist Board, 64 Knutsford Blvd., Kingston 5. 929-9200, www.jamaicatravel.com

22. Joint Board of Teacher Education, 2 Gibraltar Camp Road, University of the West Indies, Kingston 7, www.jbte.edu.jm:1104

23. Kingston Restoration Company (KRC), 3 Duke Street, Kingston, 922-3126, krc@infochan.com

24. Ministry of Commerce, Science & Technology, 36 Trafalgar Road, Kingston 10, 929-8990, www.mct.gov.jm

25. Ministry of Health, 2 King Street, Kingston, 922-6084

26. Ministry of Education, Youth & Culture, 2 National Heroes Circle, Kingston 4, 922-1400, www.moec.gov.jm

27. Ministry of Land & Environment, 16A Half Way Tree Road, Kingston 5, 920-9117

28. Montego Bay Marine Park Trust (MBMPT), Pier 1, Howard Cooke Boulevard, Montego Bay, 940-0659, mbmp@n5.com, naf-hope@cwjamaica.com

29. National Arboretum Foundation, 58 Hope Road, Kingston 6, 927-1371/927-1375

30. National Environmental Education Committee, 10 Caledonia Ave. Kingston 5, 754-7540 ext. 2304 www.nepa.gov.jm/neecweb

31. National Environment & Planning Agency, 10-11 Caledonia Ave., Kingston 5, 754-7540 pubed@nepa.gov.jm, www.nepa.gov.jm

32. National Environmental Societies Trust, 173 Constant Spring Rd, Kingston 8, 969-6502, contact@nestjamaica.com, www.jsdnp.org.jm/nestjamaica

9. Environmental Foundation of Jamaica, 1B Norwood Avenue, Kingston 5, 960-6744. Toll Free: 1-888-991-2953, www.efj.org.jm

10. Fisheries Improvement Project, c/o Discovery Bay Marine Lab, Discovery Bay P.O., St. Ann, 973-2241

11. Forestry Department, 173 Constant Spring Road Kingston 8, 924-2667-8, www.forestry.gov.jm

12. Friends of the Sea, 5 Pineapple Place, Ocho Rios, St. Ann , 974-4428, Info@friendsofthesea.org

13. Hope Zoo's Tropical Learning Centre, Old Hope Road, Kingston 6, 927-1085

14. Institute of Jamaica, East Street, Kingston, 922-0620, www.instituteofjamaica.org.jm

15. International School of Jamaica (ISJA), c/o Casa Maria Hotel, P.O. Box 10, Port Maria, St. Mary, 725-0933, 725- 0185, isja1@yahoo.com

16. Jacks Hill Community Council (JHCC), Jacks Hill P.A., St. Andrew, jhcc@yahoo.com

17. Jamaica Conservation and Development Trust (JCDT), 29 Dumbarton Avenue, Kingston 10, 920-8278-9, jcdt@jcdt.org, www.greenjamaica.org

18. Jamaica Environment Trust, Earth House, 11 Waterloo Road, Kingston 10, 960-3693, jet@infochan.com, www.jamentrust.org

19. Jamaica Organic Agricultural Movement, c/o Ministry of Agriculture, Room 407, Hope Gardens, Kingston 6, 927-1202, joam@mail.com

20. Jamaica Public Service Co.Ltd, 6 Knutsford Blvd, Kingston 10. 926-3190, www.jpsco.com

3. Form a committee and assign responsibilities

- Set up a working committee to direct and implement the programme. Membership should include the principal, representatives of the teachers, students, parents, ancillary staff, school board and community.
- Assign responsibilities to sub-committees/individual members – for example a project manager, public relations officer, accountant, maintenance wardens. Establish organisations i.e. clubs to obtain support.
- Decide on broad implementation strategies, e.g. curriculum integration, group contributions from school clubs, parent-teacher associations.

4. Develop an action plan

- Examine the goals and assess which may be short-term and which will take a little longer.
- Consider the resources needed, what is available, what is not and how the latter may be obtained.
- Develop a plan of action taking the above into consideration. This plan must not only carry a log of events but must also record the time for various actions and events. The titles/names of those responsible for each action/event must also be recorded. In the school situation activities planned must always have a link with the curriculum.
- An action plan could use the following template:

ACTION	TIMING	RESPONSIBILITY	RESOURCES

5. Communicate these suggestions to all concerned – teachers, non-teaching staff, students, parents

- Arrange a public function to launch the programme and give the general community as well as the full school

community an opportunity to understand the plans and their importance. Use the media to publicise the launch.
- Seek further comments and assistance, so as to provide a broad base of involved persons.
- Amend action plan if necessary after this feedback process.

6. Implement, monitor, maintain and improve the programme

- Implement the projects selected.
- Arrange for capable monitor(s) to follow the progress of the initiatives.
- Identify quickly and solve any operating problems and look out for further areas for improvement.
- Evaluate the programme at various stages. Make changes if necessary.
- Pay special attention to holding everyone's interest in those activities which take more time.
- Arrange for formal and accurate records to be kept. The exact format will vary with the college, but they are very important.
- Reassess for the feasibility of sustaining or expanding the programme.

7. Provide encouragement

- Highlight successes so as to provide some incentive. For example, there could be an Awards/Exhibition Day. (This could be linked with a fund-raising effort.)

Adapted from: Glasgow J., J. HoLung (2000). *The Pathway to EESD in Your School*. Kingston, Jamaica: MOEC.

Using ideas from: Emanuel, E., S. Waite (2000). *'Starting an Environmental Stewardship Programme.'*. Kingston, Jamaica: ENACT Programme.

Appendix 5
Useful Contact Agencies and Organisations

1. Association of Development Agencies, 12 Easton Avenue, Kingston 5, 927 8272, asdevgen@cwjamaica.com

2. Association of Science Teachers of Jamaica, c/o Chairman, Central Region, Dr. Errol Miller, Knox Community College, Spaldings, Manchester 987-8056

3. Bird Life Jamaica (BLJ), c/o Life Sciences Department, University of the West Indies Kingston 6, 927-1864, birdlifejamaica@yahoo.com

4. Bluefields Peoples Community Association (BPCA), Bluefields PA, Westmoreland, 955-8792-3, bpca@cwjamaica.com

5. Caribbean Coastal Area Management Foundation, Bustamante Drive, P.O. Box 33, Lionel Town, Clarendon, 986 3344, pespeut@infochan.com , camf@n5.com.jm, iparchment@yahoo.com

6. Coalition for Community Participation & Governance, 47 Beechwood Avenue, Kingston 5, 929-8873

7. Construction and Resources and Development Centre (CRDC), 11 Lady Musgrave Avenue, Kingston 5, 978-4061, crdc@jol.com.jm

8. Dolphin Head National Park Trust, Lucea P.O., Hanover, 952-1324 / 383-4678, paulahurlock@hotmail.com

Appendix 4
Days of Environmental Significance

Clubs can support and participate in activities organised to mark these special days. Contact NEPA and other government agencies to find out the exact dates as these may vary from year to year.

January	Earthquake Awareness Week
February	World Wetlands Day
March	World Water Day World Meteorological Day
April April 1 – June 30	Earth Day Caribbean Spiny Lobster closed season
May	International Day for Biological Diversity Labour Day Jamaica's Peace Day
June	Disaster Preparedness Month National Environmental Awareness Week World Environment Day World Oceans Day
June – November	Hurricane Season
July	World Population Day
August	Emancipation Day Independence Day
September	International Ozone Day International Coastal Clean-up Day Maritime Week World Tourism Day
October	National Wood and Water Day World Habitat Day International Disaster Reduction Day World Food Day Fire Safety Awareness Week International Day for the Eradication of Poverty National Heritage Week National Heroes' Day
November	National Science and Technology Month World Peace Day
December	World AIDS Day

B. Getting a Student Stewards' Group Started

1. Ask for permission from administration.
2. Meet with interested students who wish to become stewards and inform the administration.
3. Decide on a meeting place, time and date then ask a tutor to attend the meeting.
4. Decide who will be the stewards' group leader and assistants. These persons will be responsible for organising meetings, photocopying checklists, collating information on lists, etc.
5. Decide on a date for monthly/bi-monthly meetings and on a suitable venue.
6. Divide up the physical area of the institution into workable sections for monitoring.
7. Assign specific areas to teams of two/three students for regular checking.
8. Perform weekly checks of your area using the checklists. (See page 19. If you find the list too long, use an amended version.)
9. Speak at once to persons who are performing unacceptable actions.
10. Give the completed checklist to your teacher/advisor by depositing it in the agreed area.

11. At your monthly meetings

- Discuss common problems/aspects/areas.
- Collate the specific data from the checklists to support your observations.
- Decide on the representation to be made to the administration.
- Report on any successes in your area.
- Consider ideas for further awareness-raising strategies for the rest of the school community (e.g., poster competition, assemblies for special days, work days).
- Each December, have an election meeting to decide on the new group leader, and other executive members. This will ensure continuity from the final year students, as outgoing leaders, to students of other year groups who will be new leaders.

Antarctica
Some issues:
- unique environment to be preserved for peaceful uses only
- debate about exploitation of minerals in the region

The gene pool
Some issues:
- global habitat loss and loss of species
- the gene pool as the 'property' of all humankind
- manipulation /alteration of genetic material

Intellectual and cultural heritage
Some issues:
- accumulated knowledge from science and the arts as belonging to all mankind
- preservation of historical treasures which can never be replaced, for example architecture and rock carvings; the threat posed by acid rain to buildings.
- preservation of the technology, art and craft and culture of indigenous peoples of all lands, for example - Amerindians, Inuit.

Science and technology
Some issues:
- the good and bad consequences of technology
- effects of information technology on mankind
- alternative technologies (including traditional practices)

Some of the information in this appendix was taken from:
Foster-Allen, E., J. Glasgow & J. HoLung (2002). *Handbook for leadership development in environment education for sustainable development (Draft).* Kingston, Jamaica: NEEC.

and from:
STATIN & NEPA (2001). *Jamaica's environment 2001: Environment statistics and state of the environment report.* Kingston: STATIN.

Appendix 3
Global Concerns

There are some areas of the environment to which no single country or nation can lay claim. They are shared by all, and any discussions about them should take place in international fora. Some of these areas and examples of issues that affect them are:

Climate change
Some issues:
- effects of sea-level rise and impacts on small island states
- energy consumption and conservation
- response by different nations to international conventions and protocols
- changing weather patterns

Ozone-layer depletion
Some issues:
- international cooperation to phase out ozone-depleting substances
- effects on health of animals (including humans) and plants

The oceans
Some issues:
- ownership and fishing rights
- rules about oil spills and dumping of hazardous waste
- nuclear trials in remote islands/nuclear materials being transported through shipping channels
- protection of species such as whales

Outer space
Some issues:
- weather monitoring
- the arms race and space

Some Quick & Easy Stewardship Actions

Save Electricity!

1. Use natural light whenever possible.
2. Turn off lights and office machines when not needed
3. Unscrew un-needed light bulbs.
4. Replace light bulbs with those of lower wattage, or compact fluorescent bulbs.
5. Use timers on lighting systems and office equipment, if possible.
6. Turn off or increase the temperature setting on your air conditioning units before the end of operating hours.
7. Have your air conditioning systems and your refrigerators regularly serviced (these are major energy users!).
8. Turn off your computer monitor when away from your desk for more than half hour. (Screen savers do not save energy as they only save the chemicals on the screen. They actually use up a great deal of energy!)
9. Turn off your computer if not in use for four hours or more.

Save Water!

1. Search for water leaks, report and/or repair them.
2. Put water-saving devices in bathrooms, restrooms and on kitchen faucets.
3. If watering must be done, water the grounds in early morning or late evening with suitable waste water, where possible.

Save Consumables!

1. Stock your kitchens with glasses, plates, and metal wares instead of plastic or paper wares or styrofoam containers.
2. Buy non-toxic cleaning supplies in bulk or condensed forms, in recycled or recyclable containers.
3. Buy chlorine-free, high-recycled-content printing and writing paper and tissue products.
4. Photocopy and print on both sides of paper.
5. Design documents keeping in mind the amount of ink/toner used in the printing.

Re-Use Materials!

1. Re-use computer disks.
2. Buy re-manufactured or re-fillable toner cartridges for copiers.
3. Make note pads from paper previously used on one side only.
4. Re-use envelopes and file folders.
5. Set up an area for persons to exchange or give away used items.

Adapted from: Emanuel, E., S. Waite (1999). *Environmental Stewardship Guide: Environmental Stewardship of Government Operations.* Kingston, Jamaica: ENACT Programme

"We have come to…love and better appreciate nature and the dignity of labour"

- Marlon Virtue ,President
Environment Club, Church Teachers' College

The section on cultural heritage is credited to Pam Morris in:
Glasgow, Joyce (1994). *Environmental education series 38, Environmental education: Curriculum guide for upper secondary grades in the caribbean.* Paris: UNESCO.

All other sections are taken from:
Foster-Allen, E., J. Glasgow & J. HoLung (2002). *Handbook for leadership development in environment education for sustainable development (Draft).* Kingston, Jamaica: NEEC.

and from:
STATIN & NEPA (2001). *Jamaica's environment 2001: Environment statistics, and state of the environment report.* Kingston: STATIN.

Culture embodies all the accepted ways of thinking, feeling and acting in a society along with the interrelationships and organisation of these ways. We learn our culture from being part of a group. Our cultural heritage comes largely from West African and European migrants, but with elements from the culture of India, China and Lebanon fused into a distinct Caribbean mix. There are many aspects of culture; we shall mention briefly here only three – food, music and dance, and buildings and monuments.

Food: Yams, dasheen and other ground provisions along with ackees are originally from West Africa. Breadfruit and mangoes are originally from Asia. These along with saltfish, pickled mackerel, corn pork; flour and cornmeal form the basis of much of Caribbean cuisine. These items represent what was originally food for the slave population. To these add rice, curry and roti from the East Indians and cassava dishes that originated with the Tainos (Arawaks). Fresh meat dishes originally unavailable to slaves have been creolised by the addition of numerous spices. Caribbean people of all classes eat Caribbean food with pride.

Music and dance: Like our food, our heritage in music and dance comes from many sources. Folk songs often have their origin in songs that slaves and early freed men and women sang as they worked. They were often a commentary on what was happening. Trinidadian calypso and Jamaican "dance hall" music are also commentaries. Dances like quadrille and polka are European in origin but were creolised by Caribbean rhythm. Dances from Africa have been well researched and kept alive by our dance groups.

Buildings and monuments: Jamaica is rich in historic sites, buildings and monuments and attracts the attention of archaeologists and historians from all over the world. The sites reflect the various colonial and native interactions of our history. An attempt is being made to preserve many buildings by having them declared national monuments. Heritage tourism is a new idea and has potential for varying the tourism product.

Important Considerations for Stewards

SAFETY CONSIDERATIONS FOR OUTDOOR EXPERIENCES

Safety considerations are important for any outdoor experience. Possible environmental risks should be considered and managed in an appropriate manner. No matter how carefully activities are planned, there is always a chance that an incident can occur.

Depending on the kind of incident that occurs, group leaders should consider the following:

- the affected person/persons
- getting emergency service, if needed
- the needs of the remainder of the group
- notifying school administrators/parents/guardians.

RESOLVING CONFLICTS

Conflicts are inevitable, especially in a residential setting such as a teachers' college. Conflicts can be resolved in peaceful ways if they are approached maturely, so that all parties involved in the dispute can feel like winners.

As an environmental steward you can help others to maintain peace. Here are some steps for resolving a conflict:

1. Both parties should agree to the ground rules (e.g. no name calling, no interrupting of each other).
2. One person tells his/her side.
3. The second person states the first person's message and then tells his/her side.
4. Both parties suggest possible solutions.
5. Both parties agree on a resolution.

PEER COUNSELLING

Environmental stewards can also perform the role of peer counsellors when situations warrant it. Here are some basic principles of counselling.

A counsellor:

1. provides a secure, comfortable environment for an individual or group to explore issues for themselves. Such an environment should enable the individuals to "open up"
2. should not tell people how to act, but should allow them to explore and reflect on options for themselves through appropriate questioning
3. should be non-judgemental
4. should be aware of his/her own feelings and reactions to what is said or done in a counselling situation
5. should value other's experiences
6. should trust and respect others if he/she hopes to be trusted and respected.

Natural Disasters

The geographical location of Jamaica, its geological history and physiography make the island prone to natural disasters. Earthquakes, hurricanes, storms, flooding and landslides are natural disasters that occur, sometimes resulting in loss and damage to human life, ecosystems and property. Expanding urbanisation of reclaimed land in the narrow coastal fringe and on steep slopes increases risks from natural disasters. Excessive soil erosion raises the levels of stream beds contributing to flooding. Rising sea levels due to climate change will affect low-lying areas and coastline, reduce freshwater supplies and displace both biological and human communities. Jamaica is situated approximately 56km south of the Cayman Fault and lies within one of the world's highest seismic risk areas.

Solid and Hazardous Waste

The amounts of waste generated in Jamaica are difficult to quantify. Solid waste that could be handled by municipal or other collection is called collectable waste. This is the only waste that can be quantified, as waste is often burnt or thrown on empty lots or into gullies. The data indicates that each Jamaican generates between 0.6 kg and 0.8 kg of solid waste per day.

Many companies produce far more waste than is delivered to dumps. This waste is often utilised in the factory where it is produced, or it is sold or burnt in a furnace. The main waste products from bauxite and alumina plants are sodium hydroxide and so-called red mud. Most of this is deposited in large ponds. It is estimated that 14 million tonnes of red mud slurry are produced annually.

Bagasse, a waste from the sugar industry and coconut shells are sometimes used to produce energy.

Cultural Heritage

The use of energy is a necessity for human society. How much we use has, to a large extent, determined the lifestyle of various societies. Our basic source of energy is the sun. The most common secondary sources today are petroleum products, electricity derived from these products, hydroelectric power and firewood. Some energy is derived from wind, solar cells and the burning of waste products like bagasse.

Energy consumption in Jamaica is rising steadily. Day to day living in our homes uses the largest amount of energy, but the mining and transport sector are also heavy users of energy. The use of petroleum, charcoal and firewood has grown, while alternative sources such as wind, solar energy and biogas are little used. Although the use of solar energy is increasing, there is such abundant sunlight that we should make better use of this source. We might also consider quick growing species of trees, like *Leucaena sp*. in fuelwood plantations and so preserve our forests. Jamaica's first wind turbine (at Munro College, St. Elizabeth) began operating in 1996.

Human Communities

The development of human settlements involves a transformation of the natural environment into a man-made environment. The characteristics of this new environment are determined by culture, but there are always environmental problems which arise. Rapid urbanisation is one of the world's greatest environmental problems. because it calls for the speedy addition of infrastructure, shelter and services like health, education, electricity, water supply, sewage treatment, employment. In addition, urban centres draw heavily on environmental resources and contribute little to them. Resources are usually brought into urban centres from elsewhere.

In Jamaica, the urban population has risen from about 32 per cent in 1960 to just over 50 per cent in 1999. Most of the estimated 2.59 million (1999 figure) people live on or near the coast. Age group distribution is changing too, as the average lifespan increases.

SOME DO'S AND DON'TS FOR ENVIRONMENTAL STEWARDS

DO!	DON'T!
Understand your role and set a good example	Get upset with offenders (even repeat offenders!)
Enjoy your work	Give directions without explanations
Evaluate your performance	Dominate discussions with your point of view
Be an organiser	Forget your routine checks
Be patient and understanding and cooperate with others	Leave your college administrators outside of your plans and activities
Consider: What can I do about this? What am I going to do about it?	Be judgemental
Communicate clearly and simply	Be partial
Follow up to ensure completion	Ignore the help you can get from others
Stress the simple things that everyone can do	
Encourage individual actions	

Writing an Effective Grant Proposal

Writing grant proposals can lead to financial support for a stewardship programme. Foundations like the Environmental Foundation of Jamaica and private sector organisations can be valuable sources of support. Firstly, you should find out the broad objectives of the funding agency's programmes to determine if your project will meet their objectives.

These organisations vary in what they request for a proposal; it is therefore wise to speak with a representative of the donor agency to obtain their guidance. The following outlines the minimum that is usually needed:

- **Statement of how your project will meet the goals of the funding agency's programme.**
- **Problem statement** of the need your project addresses. Outline the support you may already have received from other sources for your project.
- **Goals statement**. Explain how your project will address the problem identified in the problem statement.
- **Action plan**. List the tasks identified to achieve your goals. Include a timeline.
- **Budget**. List costs.
- **Evaluation method**. Describe how you will measure the success of your project.
- **Sustainability.** Explain how the project and its effects will be sustained after funding ends.

Above all, **follow the directions given by the funding agency for completing a grant application**.

any known poisoning[2]. Engines using leaded gasoline emit lead fumes into the air and recycled or abandoned car batteries cause leakage into the soil. In the Hope Flats/Kintyre area, east of Kingston, sited on an old copper mine, high concentrations of lead were found in the soil in the 1980s. Primary school children screened in the 1990s had unacceptably high levels of lead in their blood, though they did not yet show signs of lead poisoning. An extensive public education campaign was launched in the area as part of a broader remediation programme which also involved covering some contaminated areas with marl and cement. Subsequent tests showed that the level of lead in the blood of the children decreased to acceptable international standards.

Minerals extracted commercially in Jamaica are bauxite, gypsum, limestone and marl. Mining operations for the extraction of aluminium from bauxite is one of Jamaica's main industries. Some bauxite is exported in crude form, but more is converted to alumina before export. Although bauxite makes an important contribution to the economy, mining and processing the ore have caused much environmental damage, including dust and noise pollution, production of red mud residue, loss of biodiversity, reduction of forest cover and increasing accessibility of forests for illegal logging using the roads built for hauling bauxite. Human communities have also had to be relocated, and roof damage associated with emissions of sulphur dioxide has been evident. Some bauxite lands have been rehabilitated; mined out areas have been covered with fertile soil and the areas used for pastures, dairy farming, fruit trees and for resettlement. The original vegetation types are, however, not renewed.

Quarrying gypsum has similar environmental effects to those of bauxite mining – natural environments are converted into barren mining areas and dust is a problem. Illegal sand mining causes river and beach erosion, flooding and destruction of agricultural lands.

Energy

[2] Jamaica no longer uses leaded gasoline.

use of protective agricultural practices like terracing, contouring and mixed farming.

Air Pollution

The earth's atmosphere is all around us, with natural systems organised for maintaining a fairly constant mixture of gases, mainly nitrogen and oxygen. This is necessary for all living things. Green plants, which give off oxygen as they photosynthesise, help to keep the level of oxygen in the air constant. Many substances or pollutants are liberated into the air, which may cause human health problems, damage to other living things or to property. For example, asthma sufferers are often affected adversely by air pollutants.

The burning of fossil fuels releases oxides of sulphur and nitrogen. When these dissolve in rain, the rain-water be**c**omes acid. Another effect of the increased burning of fossil fuels in recent times is that the increased amount of carbon dioxide and other gases released (greenhouse gases) traps too much of the sun's heat and could lead to faster than normal increases in world temperature. Should this occur, sea levels could rise and affect small islands such as are found in the Caribbean.

Some greenhouse gases, especially the chlorofluorocarbons (CFCs) found in many aerosol sprays also contribute to damage to the shield of ozone high up in the atmosphere which protects the earth from excessive ultraviolet radiation.

Minerals

Minerals are naturally occurring substances found in the earth. They are produced by inorganic processes, that is, they are not of plant or animal origin.

Several poisonous minerals are present in Jamaican soils, such as arsenic, mercury, cadmium and lead. Of these, only lead is usually highly connected with human activities, and has caused

Follow up your application with a phone call or personal visit to show your commitment to the project.

Send thank you letters to grantors and to those who helped you if you receive funding. If not it would be useful if you find out why you were not granted funds.

"Work with someone who is knowledgeable in the area; never decide to do all on your own. Seek as much help as you can."

- Lecturer, Shortwood Teachers' College

Checklist for Stewards to Use

ENVIRONMENTAL STEWARDS'
OBSERVATION AND REPORTING CHECKLIST

Zone……. Name of Environmental Steward

Date …….. ……

Time…….

(Answer each question from your observations with a tick or "x", and add comments.)

	1. Water	Observations & Comments
❑	Any leaks in faucets, toilets, basin, pipes, joints of pipes?	
❑	Anyone wasting water while showering? Brushing teeth? Washing cars? Drinking from water coolers?	
❑	Any mechanisms in toilet tanks to reduce quantity of water needed for flushing?	
❑	Is wash water being used to water potted plants?	
❑	Are drains clear, cleanly flowing?	
❑	Is area for run-off water present?	
❑	Is any erosion seen?	

wind erosion and protect coral reefs by holding back sediment that might damage coral by shading or suffocation.

Mangrove woodlands occur along much of the south coast, and parts of the north coast of Jamaica. The largest remaining stands are in the Portland Bight protected area. Mangrove woodlands are under pressure because we want to use them for housing (including hotels), charcoal burning and construction.

Water supply

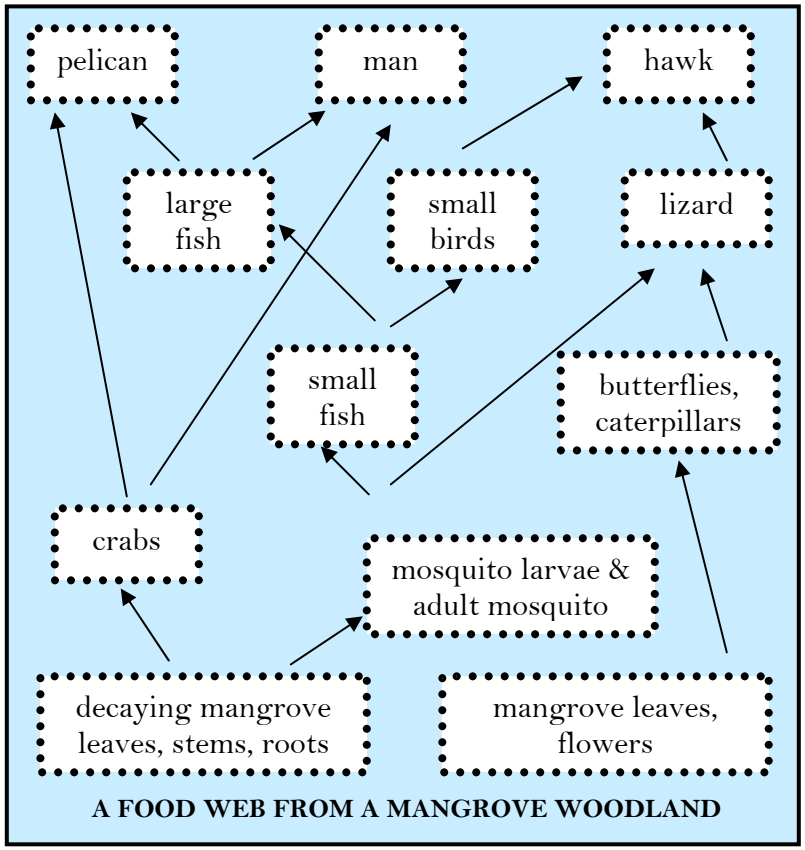
Water is a renewable resource; it is recycled in nature. Heat from the sun causes water from the land surface, from rivers, oceans and from the leaves of plants to evaporate (change into a gas). This rises high in the air, where it cools and forms very small drops of liquid water in clouds. Eventually the water falls as rain and the cycle begins again. Only about three per cent of all the water on earth is fresh water. About three quarters of this is trapped in ice caps and glaciers. In Jamaica, over 90% of the water supplied to everyone on the island is groundwater. The quality of this water is high and is suitable for human consumption with minimal treatment. Threats emerge, however from seepage of sewage and nutrients from agricultural use.

A watershed is the land area that drains into a stream. Healthy watersheds are well forested. Our watersheds have been damaged by unsuitable agricultural practices, the removal of trees for fuelwood, charcoal production, yam sticks and lumber. Damage has also been caused by forest fires, human settlements along with unapproved quarrying and sand mining.

Some of the effects of this damage are: reduced vegetative cover and loss of topsoil (an inch of topsoil can take hundreds of years to develop); reduced water availability and quality; increased marine and coastal contamination and degradation; increased flooding resulting in loss of human life, property, roads and crops; loss of habitat for important flora and fauna.

We can help to protect our watersheds by planting new trees; constructing check dams across smaller gullies to control the rate of flow, trap soil and help to establish vegetation, making

the Caribbean, there are four species – the red, black, white and button mangroves. It is easy to recognise the red mangroves along our coastlines because the roots look like stilts. The black mangrove has short roots which stick up above the surface of the swamp.



A FOOD WEB FROM A MANGROVE WOODLAND

Mangroves are a breeding ground for many species, including worms, snails, shrimp, clams, oysters and some fish. They offer protection for maturing offspring. The diagram shows a small part of the kind of food web you would expect to find in a mangrove swamp.

Mangroves also filter and absorb pollutants in runoff, and so improve water quality. They protect shorelines from wave and

	2. Beautification	Observations & Comments
❑	Is lawn cut regularly and properly?	
❑	Are dead/living branches or electric wires hanging dangerously?	
❑	Are the trees and shrubs appearing diseased?	
❑	Are labels on trees in good condition?	
❑	Is there litter on grounds, corridors, rooms?	
❑	Are floors, windows, shelves clean?	
❑	Are desks, chairs marked up or damaged?	
❑	Are signs for "no walking" and "keep off the grass" being observed?	

	3. Materials Management	Observations & Comments
❑	Is paper being well stored? Is paper being used on both sides?	
❑	Is there wastage in use of photocopiers or computer printers?	
❑	Are re-usable items thrown away (e.g., tissue rolls, plastic containers)?	
❑	Are there used computer parts or other unusable machines or parts lying around?	
❑	Are cleaning agents being stored appropriately?	
❑	Are un-used chemicals, paints being disposed of properly?	
❑	Are empty chemical containers being disposed of properly?	

	4. Waste Management	Observations & Comments
❑	Is garbage being placed in correct containers in rooms, kitchens and bathrooms?	
❑	Are more garbage bins needed?	
❑	Are the garbage bins emptied in good time?	
❑	Is any garbage material being re-used?	
❑	Are students creating an un-official "dump" area anywhere? Where is it?	
❑	Are grease traps in kitchens working well?	
❑	Are food peelings being disposed of in designated areas?	
❑	Are floors, counters in kitchens wiped clean daily?	
❑	Are small soap pieces left in showers, basins?	
❑	Are paper and plastic wrappings being properly disposed of?	
❑	Is burning occurring anywhere? If so what is being burned?	

	5. Electricity Conservation & Management	Observations & Comments
❑	Are lights left on in unoccupied rooms?	
❑	Are people sleeping with room lights left on?	
❑	Are outdoor lights switched off in the days?	
❑	Are any appliances left on while not in use?	
❑	Are screen savers used on computers?	
❑	Are those operating photocopiers and printers using them efficiently and correctly?	
❑	Are kitchen lights turned off at nights?	
❑	Are plugs and sockets damaged? Are wires near them broken or fraying?	

Appendix 2
Information on the Jamaican →Environment

Jamaica's biodiversity

The diversity of plants and animals in Jamaica is extraordinary and the island has a high level of endemic species, that is, species that are found nowhere else. This is because there is such a variety of types of ecosystems – wet and dry forests, rivers, caves, mineral springs, sandy beaches, rocky shores, mangroves, herbaceous swamps, swamp forests, salinas, mountains and plains. The essential goods for our survival depend on the variety and variability of genes in these species, on the numbers of their populations and the ecosystems of which they are a part.

Several factors threaten Jamaica's biodiversity; for example, urban growth, pollution and deforestation. One useful strategy to abate these threats is a system of 'protected areas', which should remain untouched so as to preserve them. These areas include the Blue and John Crow Mountains National Park, Coral Spring/Mountain Spring, Portland Bight, Palisadoes-Port Royal area, Montego Bay, Negril and Ocho Rios Marine Parks. The system, however, is inadequate and many more areas need to be protected. The Black River Morass is protected under the Ramsar convention for protecting wetlands. At the present time, 14 animal endemic species and 200 plant endemic species are classified as either endangered or threatened. Such species include the Jamaican coney and the giant swallowtail butterfly

Mangrove woodlands – a special ecosystem, an example of our biodiversity

Mangroves are a group of plants found in river estuaries and coastal swamps. They are adapted to living in brackish water, in water-logged conditions, without much soil air. In

objectives/targets to ensure ongoing improvement; improve procedures, or do some things differently; train staff; improve efficiency or acquire new equipment.

Operators of businesses and institutions must balance long and short term benefits against what the business and institution can afford. The benefits of an EMS include:

- a good public image
- savings in energy and in the cost of waste disposal
- reduction of accidents
- avoidance of environmental breaches and resulting fines
- protection of resources for future generations
- certification under International Standards, for example, ISO 14001.

These benefits clearly link the establishment of environmental management systems with movement along the path to sustainable development.

Adapted from: St. Ann Environment Protection Association[1] (2003). *Environmental education tool for communities: an environmental education manual (Unit 6).* GOJ/NEPA/USAID under the Coastal Water Quality Improvement Project (CWIP).

[1] Now known as Northern Jamaica Conservation Association (NJCA)

How Green is Your School?

1. Does your school have a *recycling programme* for its waste paper, cardboard, cans and bottles?
2. Does the school have a *policy* to use recycled paper?
3. Does your school seek to avoid the use of disposable paper, plastic, foam cups and plates?
4. Has the school eliminated the use of aerosol sprays and fire extinguishers that contain CFCs?
5. Does the school have an active policy and strategy to reduce water consumption?
6. Does the school use environmentally-friendly cleaning liquids?
7. Does the school avoid the use of garden and household pesticides, using environmentally-friendly alternatives instead?
8. Does the school have an active *policy and strategy* to reduce its energy consumption?
9. Does the kitchen offer a choice of healthy foods, and discourage students from eating "junk" foods?
10. Does the kitchen collect its food waste to turn it into compost, or use it to feed dogs or pigs?
11. Does the school have houseplants in rooms and corridors?
12. Is the school making an effort to beautify its grounds?
13. Does the school provide environmental education and project-work for students and staff?

14. Does the school get involved in local environmental activities, (both staff and students)?

15. Does the school invite speakers to talk about the environment and its problems?

16. Does the school library ever hold special exhibitions of books, magazines about the world environmental crisis?

17. Does the school have an environmental club or society?

18. Has your school ever undertaken an environmental audit of its activities and courses?

19. Has your school set up an Environmental Action Team to look into the kinds of actions which it could take?

20. Does the school encourage staff and students to take a positive attitude, building the belief that we CAN make a difference?

SCORING:
Yes = 2
Partially, presently discussing this = 1
No = 0

REPORT CARD

36-40 = You are doing excellently!! Take a Green Medal!!
31-35 = You are doing quite well!
21-30 = You have made a start, but you are not yet a green school.
0-20 = Plenty of room for improvement, must do better next term.

Adapted from: Dauncy, Guy (1990) *Building a green future: thirteen practical ideas for environmental organizers and activists.* Ganges, B.C: Garden of Gaia.

Appendix 1
Environmental Management Systems

An Environmental Management System (EMS) is a management tool or guide which enables organisations, like businesses, government departments and institutions to:

- look at how they operate
- determine the environmental impacts of their activities
- develop ways to make their operations environmentally friendly.

Developing this tool demands the initial and continuing commitment of administration and must be guided by a written environmental policy or statement. Stages in its development involve (1) planning (2) doing (3) checking (4) acting. All procedures should be documented.

(1) *Planning* involves the development of an organisational profile; identifying the impact of the operations on the environment; legal and other requirements, setting objectives and targets developing environmental management programmes.
A target is defined as the required action(s) that need(s) to be taken to ensure that the objective is met. It should contain the time period and the changes required.

(2) *Doing* involves carrying out these actions.

(3) *Checking* implies ongoing monitoring to ensure that the EMS is being effective and identifying areas for improvement. It provides information concerning the environmental objective and targets set.

(4) *Acting* implies taking steps based on the results of checking. The administration may now set new