Environmentally Sound Design & Management

Definition & Motivation

- Environmentally sound design (ESD):
  - Design and implementation of development activities and projects so that the environmental damage associated with meeting a particular development objective is kept to a practicable minimum.
  - ESD seeks to prevent the FAILURE of economic or social development projects due to environmental causes

How can environmental damage cause project failure?

- Economic failure:
  - Complete siltation of a small-scale dam and irrigation project in only a few years
  - New crop introduction degrades soil and forces residents to abandon the land
- Social failure:
  - Wastes from a health post contaminate community water supply

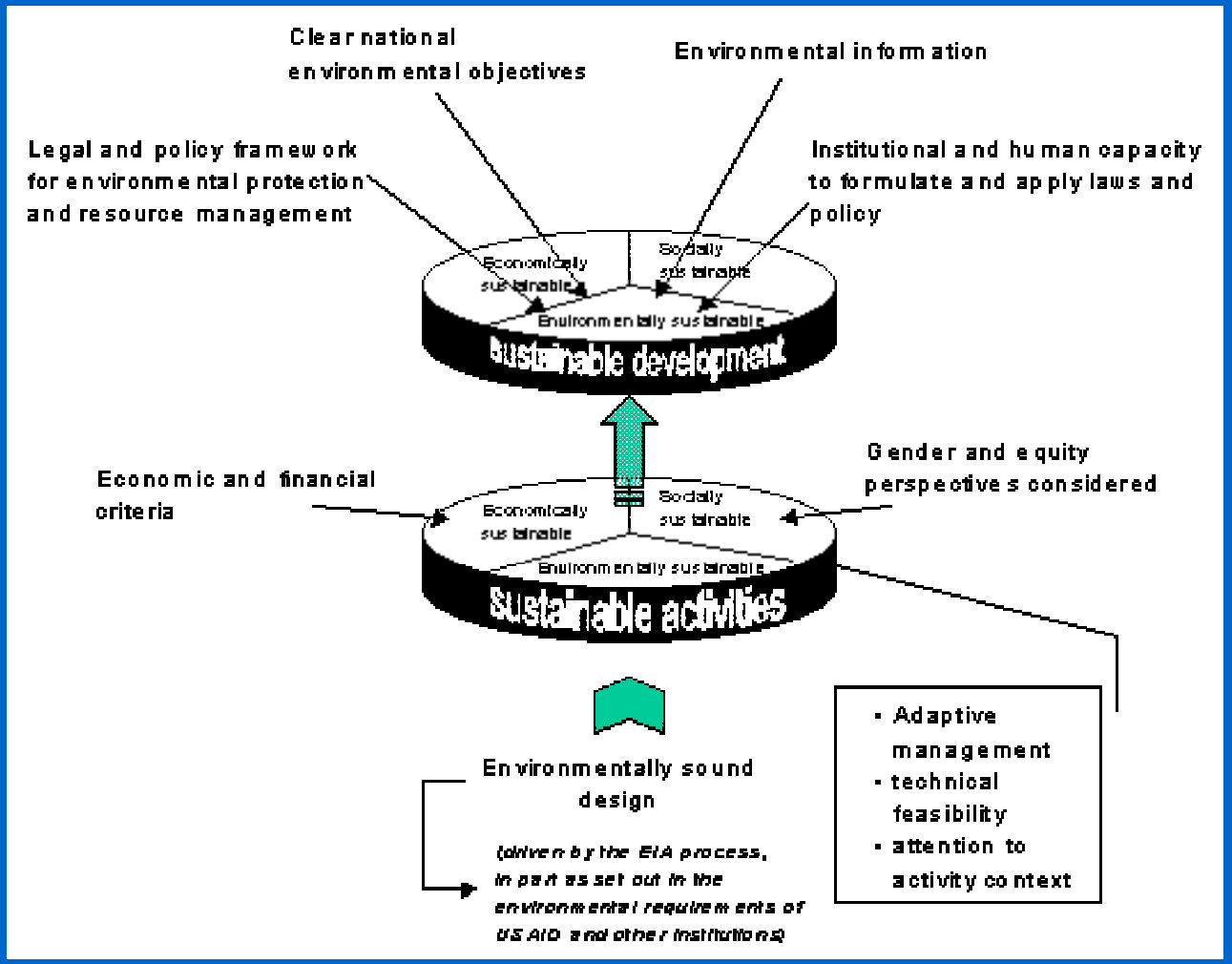
ESD focuses on prevention

- ESD is prevention-oriented across the project lifecycle.
  - Prevention of environmental impacts begins with choice of *means*
  - *Prevention continues in:*
    - ➔ *The specifics of project design*
    - ➔ *Operating practices*
    - ➔ *Maintenance*
    - ➔ *Decommissioning*
- *Where environmental damage cannot be prevented, it may be repaired.*

ESD and sustainable development

- ESD is at the project or activity level
- ESD is essential to designing and implementing *sustainable activities*
- Sustainable activities are an essential part of *sustainable development*

ESD and Sustainable Development



ESD and Environmental Impact Assessment

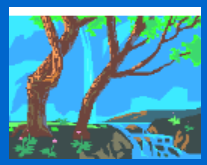
- Environmental impact assessment is:
  - A formal process process for identifying the likely effects of particular activities or projects on the environment, and on human health and welfare
  - EIA is the focus of this course
- Environmental impact assessment organizes and facilitates ESD.

ESD requires best development practices

- ESD requires that environmental impacts be identified, predicted and mitigated.
- ESD also requires best development practices *in general*:
  - Technical feasibility
  - Attention to context
  - Stakeholder commitment
  - Capacity-building
  - Adaptive management

Each best practice has specific applications to environment. . .

Technical and Engineering Criteria for ESD



- Appropriate choices of crops or trees?
- Design based on knowledge of environmental conditions?

  - ➔ variation in rainfall, temperature, potential for natural catastrophes (earthquakes, cyclones, floods, etc.)?
- Appropriate choices of construction methods and building materials?

Understand the Policy and Social Context

- National environmental laws and regulations
- **Resource tenure** and property rights often influence natural resource management.
  - Tenure rights vary among cultures and are frequently **gender-specific**
- Education of operators & availability of spare parts determines appropriate technology

Stakeholder commitment

- Local participants often operate the project after assistance ends
- Operating practices are often essential to sound environmental management
- Stakeholder commitment and understanding are essential to maintain proper operating practices

Capacity-building

- Can be essential for environmentally sound operation and maintenance
- Train stakeholders to see how:
  - project activities can affect the environment
  - sound environmental management and economic development are reinforcing

Practice adaptive management

- Project budgets should **identify funding** sources and responsibility for **monitoring and evaluation** from the **onset of project design**.
- **Anticipate the costs** to do it right and include a **strategy** and budget for **environmental mitigation and monitoring,** if needed.
- Managers need to **be flexible** and open to change, in order to make adjustments and take steps to deal with unanticipated adverse impacts.

Identify Regional Lessons: Learning from Each Other

- Adaptive management also means learning from other projects and other organizations:
  - Communicate. Share lessons learned about environmental impacts. Both formal and informal mechanisms are important.
  - Coordination and standardized field methodologies can be very helpful.

The environment is not enough

- To succeed, projects must be:
  - Environmentally sustainable
  - Socially sustainable
  - Economically sustainable
    - ➔ Is activity financially sustainable without continuous external support?
    - ➔ Do benefits of activity outweigh costs?
- ESD means that environmental criteria are considered WITH economic and social criteria

Community participation is central to ESD

- Local participants/stakeholders should be involved from the beginning of the design process to assure:
  - Technical soundness.
    - ➔ their detailed knowledge of local conditions is often critical in anticipating and identifying potential impacts
  - Stakeholder commitment.
    - ➔ by participating in design, implementation and monitoring, they gain *ownership* and *responsibility*, and a clear understanding of objectives and anticipated outcomes
    - ➔ their full participation serves as an incentive to identify and mitigate adverse impacts

- Adaptive management:
  - ➔ they need the understanding and capacity to adapt activities to future change after donor support ceases
  - ➔ They are in the **best position** to **monitor long-term environmental effects** of project activities. Local communities are the long-term residents of the area, and are best able to identify and address adverse impacts after donor assistance ends.
- Local residents must *live with* the environmental *impacts* of activities

"Community" = men AND WOMEN

- Women are often key to food production, NRM and developing country economic systems.

- Often farmers and smallholders are synonymous terms for the women in a community
- In many rural areas, women are the majority of the adult population

- Women have extensive knowledge of the environment and natural resource base, including:
  - **subsistence agriculture, wood fuel utilization, water availability and quality, gathered foods, and certain medicines.**
- Obtaining women's input may require special effort
  - in many cultures, gender roles prevent women from making their opinions known directly to project designers.

Common environmental design failures

- Economic changes⇔Env. Changes
  - Without a systematic approach, poor environmental design will result
- Common failures include:
  - Failure to anticipate potential "critical events" - drought, famine or civil strife and related emergency assistance
  - Failure to consider the environmental effects of increased income and population growth. . .

Common failures

- Failure to consider the effects of increased scale:
  - The environmental effects of a small-scale animal husbandry project may be minor
  - BUT if the project is successful, and many more individuals begin to hold larger numbers of animals. . .

Common failures

- Failure to consider the effects of food aid on natural resource management
  - Flow of food resources into a region fulfills a vital need
  - *However*, food aid can alter the relationship between people and how they manage the natural resource base.

Common failures: food aid

- Food aid can:
  - ➔ cause changes in crop and livestock production strategies;
  - ➔ alter land tenure arrangements, grazing regulations, etc;
  - ➔ alter changes in seasonal and long-term migration patterns;
  - ➔ alter wood gathering patterns
  - ➔ reduce local seed production and utilization, this in turn can result in loss of genetic resources and biodiversity
  - ➔ introduce foreign species

Food aid activities can cause. . .

Irrigation	->	Waterborne disease, soil salinization
Water Supply/ Sanitation	->	Groundwater contamination, waterborne disease
Health Services	->	Medical wastes
Rural infrastructure (roads, etc.)	->	Opening forests to exploitation
Natural resource management	->	Exotic species introduction
Crop protection	->	Environmental contamination

Can conservation-based projected be environmentally unsound?

- Clearly, these projects can be socially or economically unsound. . .
- But what of environmentally unsound?
  - Consider the example of Kuzdu:

Kudzu: imported into the U.S. from Asia in 1800s for erosion control, it has no natural enemies and has become one of the most significant natural threats to native species.

Environmental issues in conservation-based projects?

Class Discussion:
Participant examples