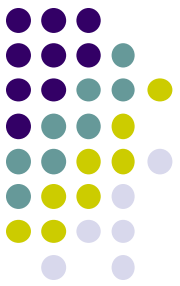


Environmental Impact Assessment

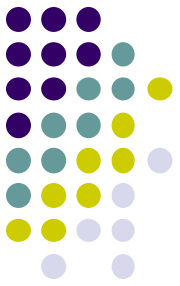
Prepared by
Dr. Siraj M.A. Goran

EIA (Environmental Impact Assessment)

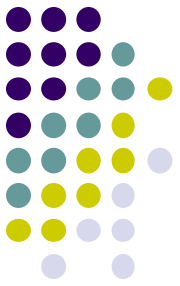


- EIA is a systematic process to identify, predict and evaluate the environmental effects of proposed actions and projects on the environment.
- A **broad definition of environment** is adopted. Whenever appropriate **social, cultural and health effects are also considered as an integral part of EIA.**
- Finally, **particular attention** is given in EIA for **preventing, mitigating and offsetting the significant adverse effects of proposed undertakings**

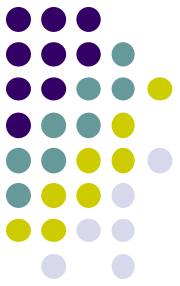
Definition



- It is a **planning and management** tool for **sustainable development** that seeks to identify the type, magnitude and probability of environmental and social changes likely to occur as direct or indirect result of a project or policy and to design the possible **mitigation procedure**.



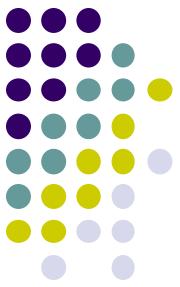
- EIA acts as a Practical Solutions for Problems) as:
- * Determining and managing (identifying, describing, measuring, predicting, interpreting, integrating, communicating, involving and controlling),



- * Potential (or real) impacts (direct and indirect, cumulative, likelihood)
- * Proposed (or existing) human actions (projects, plans, programs, legislation, activities) and their alternatives on the environment,

Environment (Physical, Chemical, biological, human health, cultural, social, economic, built and interactions)”

EIA is a tool that is applied...

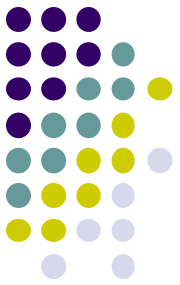


- before major decisions are taken and when all alternatives are still open;
- **to inform all stages of decision making, including final approval and the establishment of conditions for project implementation;**
- **public participation and consultation;** and
- **to integrate environmental considerations and safeguards into all phases of project design, construction and operation**



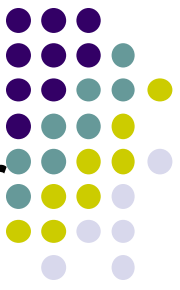
Environment will cover, the existing condition in or/and around the area is as much as:

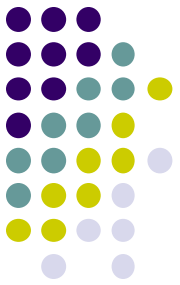
- (i) Physical environment to include:
 - (a) **Land and Climate:** Weather conditions to include temperature (ambient), humidity, wind velocity, precipitation, land use, topography, geology and seismic considerations.
 - (b) **Atmospheric conditions:** Ambient air quality at the site and around specially in down wind direction
 - (c) **Water bodies:** Laks, rivers, ponds and canals. Hydrology and existing quality. Ground water availability and flow regime
 - (d) **Noise level**



- (ii) Chemical Environment to include:
 - (a) **Industrial activities**, types of industries at the site and around (10 km radius), types of wastes produced and methods of treatment and disposal of effluents.
 - (b) **City dumping sites**, land fill sites

- (iii) **Infrastructure:** Public Services, Water Supply, Waste Treatment Plants, Energy resources, distribution system, Transport system, communication, important buildings, heritage, sites etc.
- (iv) **Biological environment:** Vegetation, forests, flora, fauna. Natural vegetation, parks, cultivated land, crops, threatened and endangered species.





- Before 1960, seldom environmental factors considered in economic equation.



- **Environment** is a comprehensive term meaning **surroundings**. It includes the gaseous envelope surrounding earth, the **Atmosphere**, the mass of water above and below the earth, the **Hydrosphere**, the land masses that support life, the **Lithosphere**, and the whole **microbes, plants, and animals**, collectively referred as, **Biosphere**.

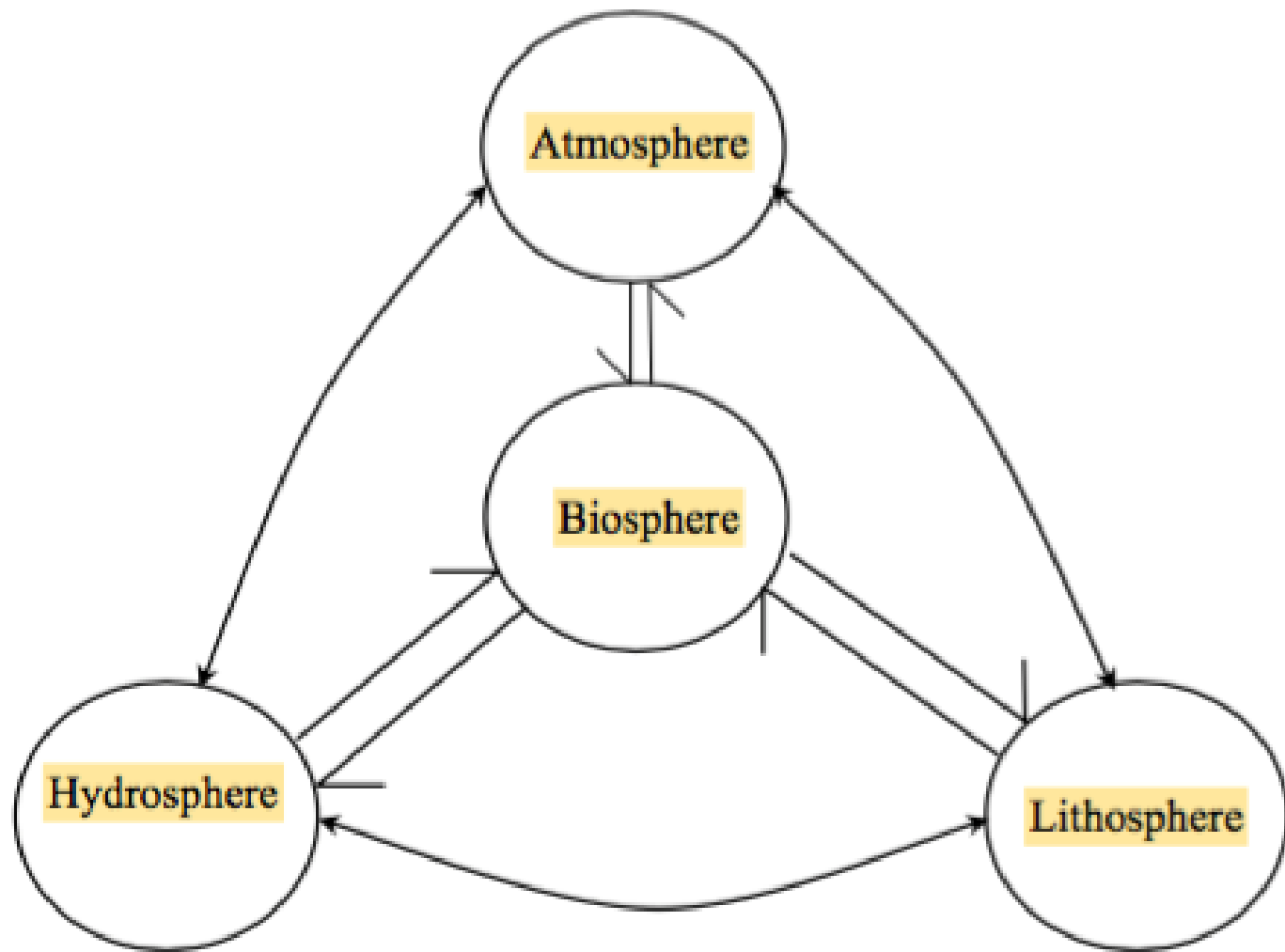


Fig. 1.1 Pyramid of life



- **Man is often said to be his own enemy.**
This is perhaps true in the consequence of **human activities to provide food, shelter, amenities (characters) and transport.**
While products of industry and agriculture make human existence more bearable and pleasant, they give rise to waste effluents and emissions.

Some of the interactions of human existence relate to:



- - utilization of a resource without impairing its use,
- - disposal of wastes without creating problems,
- - degradation of forest wealth and exploitation of biota

- The rapid growth of population, improvements in standards of living and concomitant growth of infrastructure **have altered the environment, sometimes beyond its power of resilience.** These changes have resulted in ecological crisis and have become a matter of grave concern to managers and decision makers throughout the world. The issues both at national and global levels are focussing concern of nodal agencies **(to support sustainable development and tend to produce adverse impacts on living conditions of human, animals, plants and geographical environment.**



History

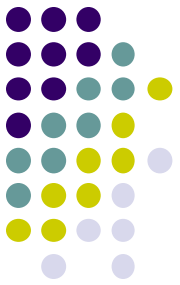


- The **National Environmental Policy Act 1969** of USA is the **legislative basis for EIA**. The policy was the result of wide spread recognition **in the 1960s that some major environmental problems were created by the government's projects (power stations, dams and reservoirs, industrial complexes)**.
- The **legislation made mandatory to assess the environmental consequences of all projects by federal agencies**.
- **In 1990s, many developed and some developing countries designed their EIA legislation. e.g. New Zealand (1991), Canada (1995), Australia (1999), Vietnam (1993), Uganda (1994), Ecuador (1997)**.
- Today, **EIA is firmly established in planning process in many of these countries**.

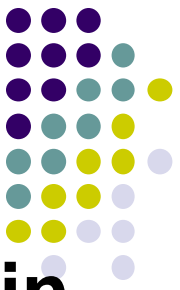
Purposes/Aims and Objectives



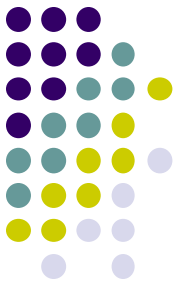
- Environmental impact assessment **is an important management tool for improving the long-term viability of projects.** Its use can help to avoid mistakes that can be expensive and damaging in environmental, social and economic terms. **Human activities are altering natural cycles and systems** on an unprecedented scale, and the **cumulative effects of these activities** are estimated to be on par with bio-physical processes as an agent of ecological change.



- Usually, the cost of undertaking an EIA accounts for only a small proportion of total project costs (**usually less than 0.1% of overall project costs**), but savings to the project from an impact assessment can often considerably more.



- More broadly, EIA is used for early warning planning of a wide range of resource use, development, and conservation initiatives in order to make the most of options for **achieving sustainability**.
- We live in a greenhouse world of ozone holes and vanishing (disappear) species. **It is now considered that the impact of human activities on the biosphere is reaching critical thresholds**, with the consequent threat of ecological breakdown and social conflict.



The immediate aim of EIA is to inform the process of decision-making by identifying the potentially significant environmental effects and risks of development proposals.

Objectives related to this aim are to:



- improve the environmental design of the proposal;
- ensure that resources are used appropriately and efficiently;
- identify appropriate measures for mitigating the potential impacts of the proposal; and
- facilitate informed decision making, including setting the environmental terms and conditions for implementing the proposal.

Purposes/Aims and Objectives (cont.)

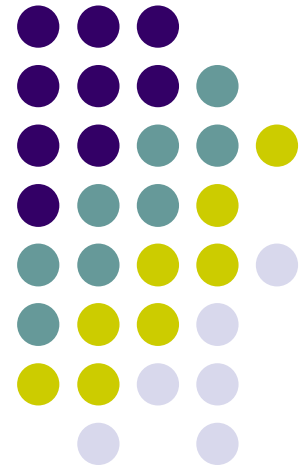


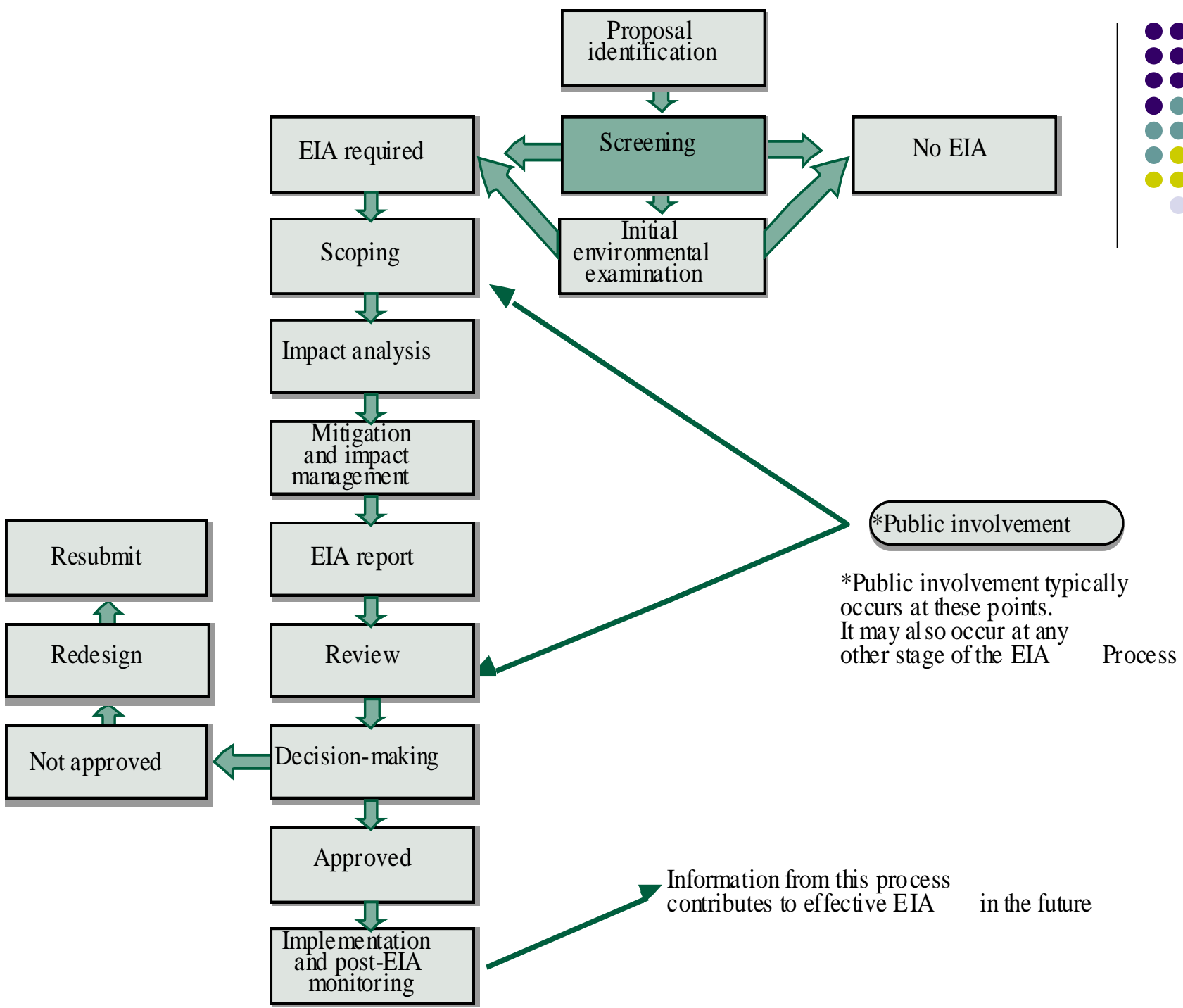
The ultimate (long term) aim of EIA is to promote sustainable development by ensuring that development proposals do not undermine (destroy) critical resource and ecological functions or the well being, lifestyle and livelihood of the communities and peoples who depend on them.

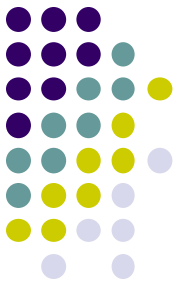
Objectives related to this aim are to:

- protect human health and safety;
- avoid irreversible changes and serious damage to the environment;
- safeguard **valued resources, natural areas and ecosystem components**; and
- enhance the **social aspects** of the proposal.

Steps in EIA







Step 1: Screening

- This step determines:
 - whether or not EIA is required for a particular project
 - what level of EIA is required (Level A, B, C)

- Screening Outcomes:
 - Full or comprehensive EIA required
 - Limited EIA required
 - No EIA required



Tools for Screening

- Project lists:
 - Inclusive (Comprehensive) — listed projects must undergo EIA
 - Exclusive — listed projects exempted from EIA

- Case-by-case examinations:
 - determine whether projects may have significant environmental effects
 - if so, project should undergo EIA

- Combination of above

Eg....



الفصل الثالث

- تصنيف المشاريع حسب درجة تلوثها للبيئة
- الأنشطة الملوثة للبيئة صنف (أ)
- اولاً :- المشاريع الصناعية
- الصناعات الغذائية
- تكرير واستخراج الزيوت النباتية
- تكرير الزيوت النباتية ومعالجات اخرى لها والزيوت المهدرجة /ومصانع الزبدة والزيوت والدهون النباتية والحيوانية المهدرجة المعدة للطعام.
- صناعة الغزل والنسيج والالياف الصناعية

مصانع الالياف الصناعية كالحريير الصناعي والنايلون والتي تحتوي على وحدات صباغة.

اعمال صباغة المنسوجات والسجاد وغيرها.

الصناعات الكيماوية.

مصانع انتاج الاحماض والقلويات ومشتقاتها.

انتاج البوليمرات.

مصانع انتاج واستنباط المبيدات الحشرية/مصانع التعبئة والخلط لكيماويات المبيدات.

مصانع تقطير الفحم وانتاج مشتقاته.

مصانع انتاج لب الورق من المواد الاولية.

المدابغ.

انتاج اللقاحات بانواعها.

انتاج زيوت المحركات والشحوم واعادة تصنيعها.

الصناعات الكيماوية المتكاملة مثلا مصانع الاسمدة.

معامل انتاج الأدوية (البشرية والحيوانية).

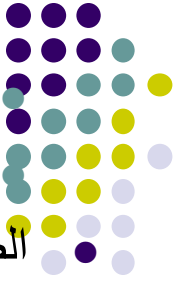
صناعة الورق والمنتجات الكارتونية وورق تغليف الجدران الداخلية.

مصانع الكبريت.

تشكيل البلاستيك – حقن البلاستيك – مصانع اللانابيب البلاستيكية – تخزين البلاستيك.

مصانع الأصباغ الزيتية والوارنيش واحبار الطباعة.

تصنيع المواد الكيماوية المستعملة في معالجة المياه.



الأنشطة الملوثة للبيئة صنف (ب)



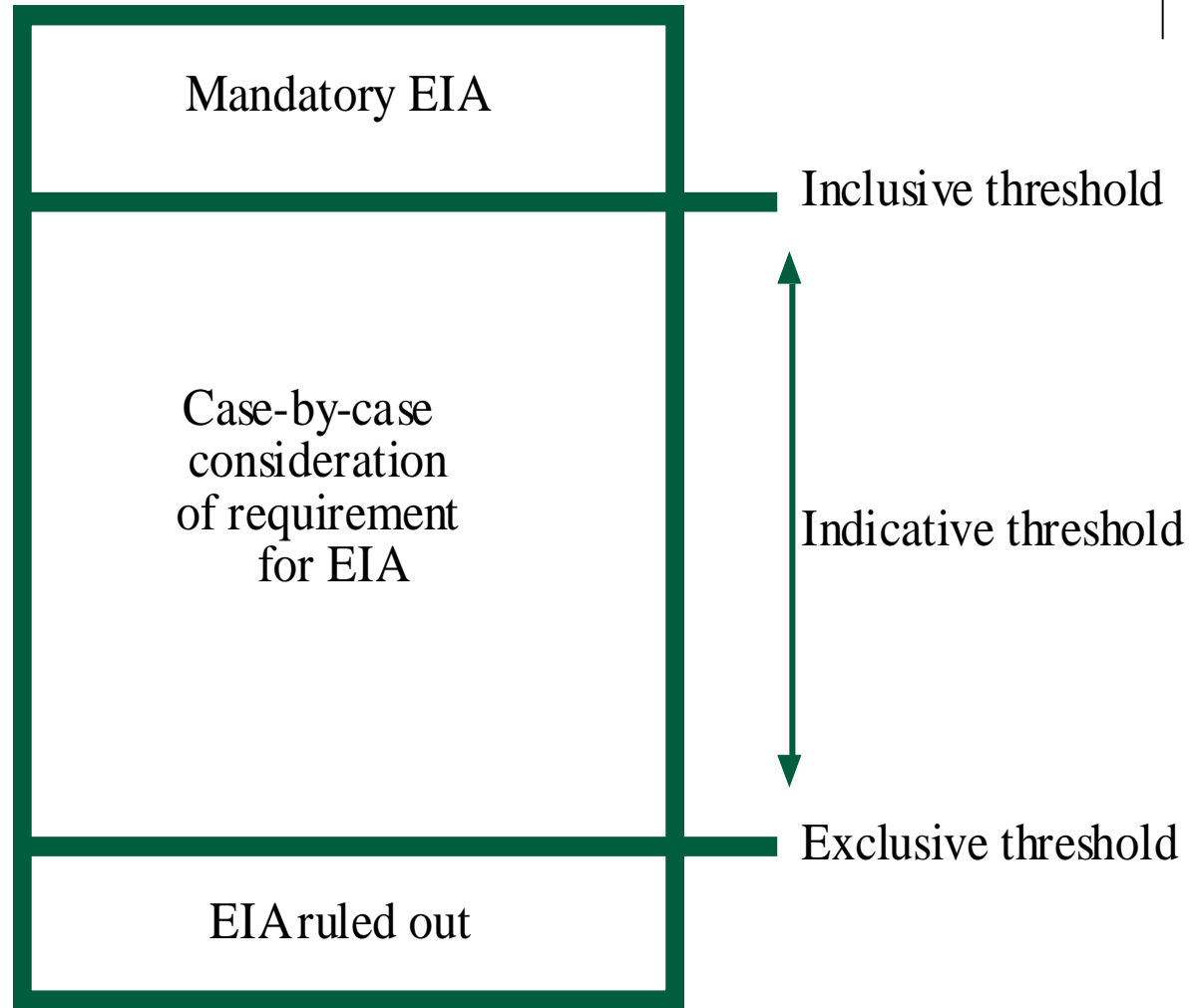
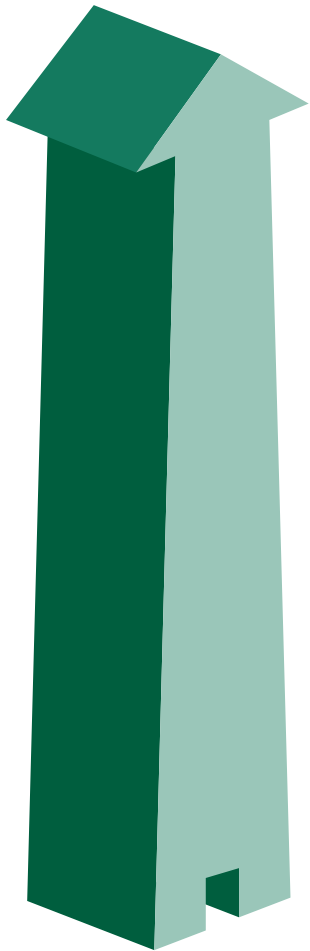
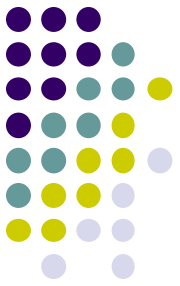
- اولاً :- المشاريع الصناعية
- 1-الصناعات الغذائية
- - تصنيع الأيس كريم ذات طاقة انتاجية (2)طن فمافوق.
- - مصانع الحلوى والعلك والسكريات والشراب والعصائر والمرطبات والمشروبات الغازية والصودا.
- - مصانع استخراج الزيوت النباتية التي لا تحتوي على تكرير او معالجة.
- - مصانع تعليب الفواكه والخضروات.
- - مصانع الخميرة وتخمير الشعير والمشروبات الكحولية بكافة انواعها.
- - مصانع فرم التبوغ وتعبئته وصناعة السجائر وتبوغ النرجيلة (التتباك).
- - مصانع تكرير السكر.
- - المصانع التي تقوم بتصنيع منتجات الاسماك .
- - مشاريع صناعات الالبان ذات طاقة انتاجية اكثر من (3)اطنان.
- - منشآت تصنيع و انتاج اعلاف الحيوانات والاسماك (ما عدا البروتين).
- - معامل تدخين المواد الغذائية التي تنتج اكثر من 500 كغم من المواد الغذائية يوميا.
- - مجزرة وتجهيز وتعبئة الدواجن والطيور.
- - محلات تعبئة الحليب في زجاجات او صفائح او اوعية اخرى/ محلات تجميع وتعبئة الحليب الخام للشرب.



الأنشطة الملوثة للبيئة صنف (ج)

- أولاً :- المشاريع الصناعية
- 1- الصناعات الغذائية
- وتشمل المشاريع الوارد ذكرها في الفصل الثالث - الأنشطة الملوثة صنف (ج) (فقرة - اولاً- 1)

Screening Process





Step 2: Scoping

- begins once screening is completed
- the most important step in EIA
- establishes the content and scope of an EIA report

Outcome:

- identifies **key issues and impacts to be considered**
- lays the foundation of an effective process, saves time and money, and reduces conflict

Types of Scoping



Closed scoping:

wherein the content and scope of an EIA Report is **pre-determined by law** and modified through closed **consultations between a developer and the competent authority**

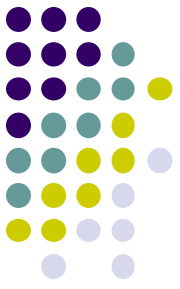
Open or Public scoping:

a transparent process **based on public consultations**

Actors

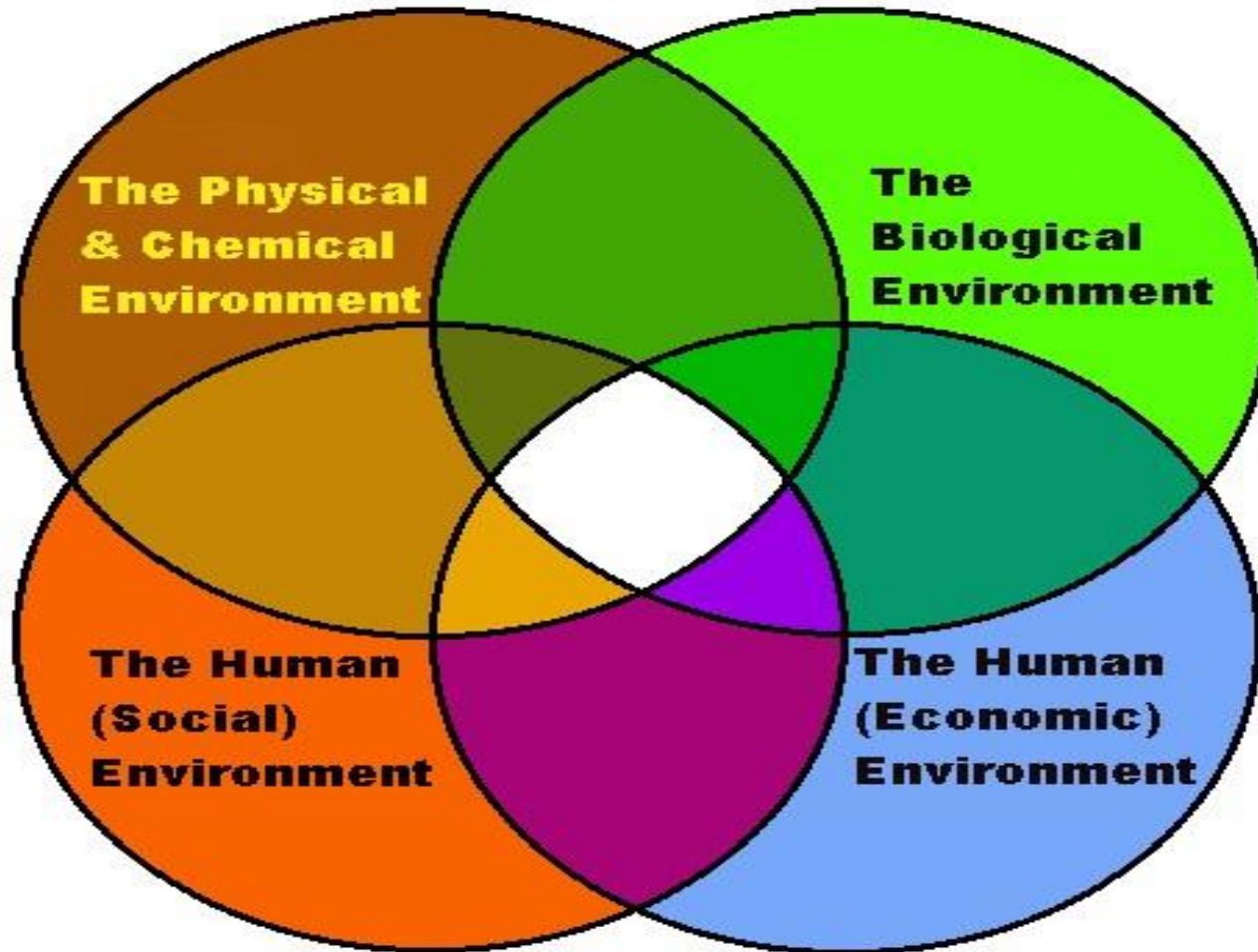
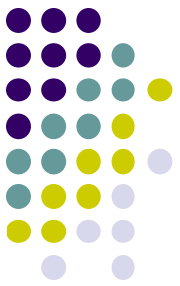
Proponent (Propose person), EIA consultant, supervisory authority for EIA, other responsible agencies, affected public and interested public

The scoping process



- prepare a scope outline
- **develop the outline** through informal consultation with environmental and health authorities
- **make the outline available**
- compile (collect) an extensive **list of concerns**
- **evaluate relevant concerns** to establish key issues
- **organise key issues into impact categories** (study list)
- **amend (improve) the outline accordingly**
- **develop ‘Terms of reference’ (ToR)** for impact analysis
- **monitor progress** against the ToR, revising as necessary

SCOPING



THE 4 FACETS OF THE ENVIRONMENT

EXAMPLE : SCOPING

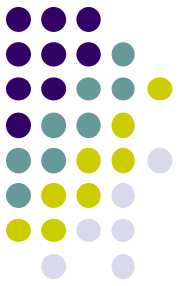
Impact Of A Proposed Paper Industry



A Paper Industry Is Proposed To Be Established In A Locality And The Effluent Is Propoped To Discharge In Adjacent River

- ETP (Effluent Treatment Plant) Will Be Installed To Bring The Discharge Down To Permissible Limit
- There Are Few Other Industries Already Established Discharging Effluent To The River At Allowable Limit???
- People Bath In River Water And Drink After Treatment?
- Significant Number Of People Depend On Fishing For Occupation?

Major Issues (scoping)



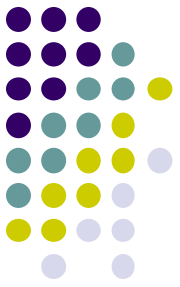
PHYSICAL AND CHEMICAL ENVIRONMENT

- The Level Of Increase Gaseous Air Pollutants
- Possible Change In Noise Level
- Change In Downstream DO Due To Discharge Of Aqueous Effluent (Organic Matter)

BIOLOGICAL ENVIRONMENT

- Eutrophication (Effluent Containing N ,P)
- Public Health Impact
- Fish Kills

MAJOR ISSUES (SCOPING)

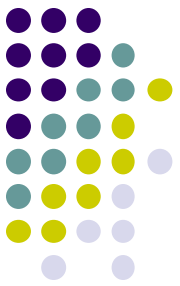


THE HUMAN (SOCIAL) ENVIRONMENT

- Affect On Fisheries And Aquaculture As A Livelihood For The Community
- Urbanization Trend And Related Problem
- Scope Of Job Creation

THE HUMAN (ECONOMIC) ENVIRONMENT

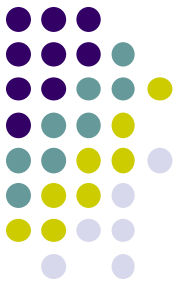
- Possibility Of Increasing Drinking Water Treatment Cost
- Productive Hour Loss Due Environmental Degradation
- Health Treatment Cost



Step 3: Impact Analysis

→ Type	biophysical, social, health or economic
→ Nature	direct or indirect, cumulative, etc.
→ Magnitude or severity	high, moderate, low
→ Extent	local, regional, trans-boundary or global
→ Timing	immediate/long term
→ Duration	temporary/permanent
→ Uncertainty	low likelihood/high probability
→ Reversibility	reversible/irreversible
→ Significance*	unimportant/important

Tools for Impact Analysis



- checklists
- matrices
- networks
- overlays and geographical information systems (GIS)
- expert systems
- professional judgement



Step 4: Impact Mitigation

- **to avoid, minimise or remedy adverse impacts**
- to ensure that **residual impacts** are within acceptable levels
- to **enhance environmental and social benefits**

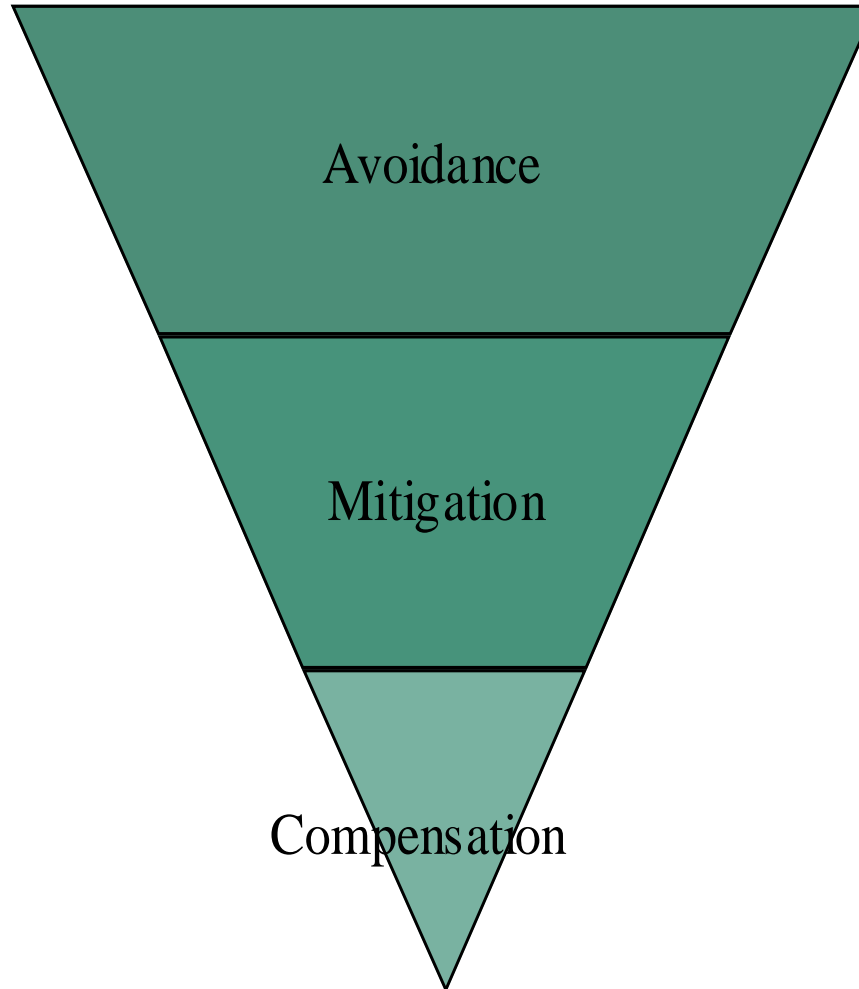
Framework for Impact Mitigation



Common (desirable)



Rare (undesirable)

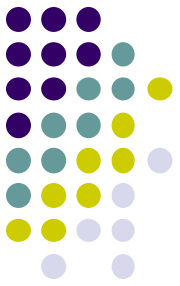


Alternative sites or technology to eliminate habitat loss

Actions during design, construction and operation to minimise or eliminate habitat loss

Used as a last resort to offset habitat loss

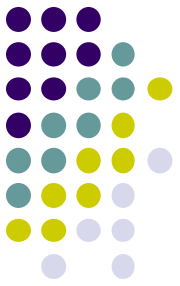
Step 5: Reporting



Different name of EIA reports

- Environmental Impact Assessment Report (EIA Report)
- Environmental Impact Statement (EIS)
- Environmental Statement (ES)
- Environmental Assessment Report (EA Report)
- Environmental Effects Statement (EES)

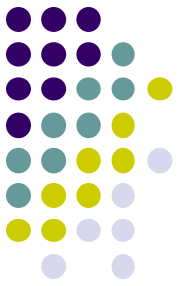
Contents of the Report



- 1-Executive summery (a non-technical summary)
- 2-International and national Regulations and law
- 3-A description of the project;
- An outline of the main alternatives studied by the developer, and an indication of the main reasons for this choice,

- 4-A description of the aspects of the environment likely to be significantly affected by the proposed project;
- A description of the likely significant environmental effects of the proposed project;
- 5-Measures to prevent, reduce and possibly offset adverse environmental effects (Mitigation measure)
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered while compiling the required information.





- 6-Environmental Baseline study
 - Environmental baseline sampling
- 7-Waste Management Plan
- 8-Environmental management and monitoring Plan
- 9-Emergency and preparedness
- 10-Conclusions
- 11-References



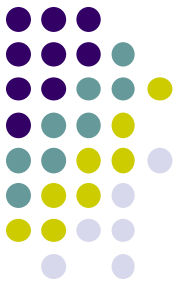
Step 6: Review

- Review the quality of the EIA report.
- Take public comments into account.
- Determine if the information is sufficient.
- Identify any deficiencies to be corrected.

Who Perform the review of EIA report in Kurdistan and around the world?

- In Kurdistan, MNR (Ministry of natural resources), Environmental committee for protection and improvement for KRG, environmental agency — Canada (comprehensive studies), standing commission — Netherlands, inter-agency committee — USA, planning authority — UK independent panel — (public inquiries)
- Public comment and input

Step 7: Decision Making



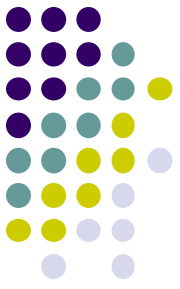
- To provide key input to help determine if a proposal is acceptable
- To help establish environmental terms and conditions for project implementation



Step 8: Monitoring

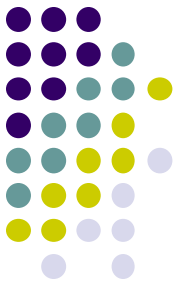
- Ensure the implementation of conditions attached to a decision.
- Verify that impacts are as predicted or permitted.
- Confirm that mitigation measures are working as expected.
- Take action to manage any unforeseen changes.

Key components of Monitoring



- Establish baseline conditions.
- **Measure impacts of a project as constructed.**
- Verify conformity with established with conditions and **acceptable limits.**
- Establish **links to environmental management plans.**
- Carry out **periodic checks** and **third-party audits.**

Public Involvement in the EIA Steps



Screening

To consult people likely to be affected by proposal.



Scoping

To ensure that significant issues are identified; project related information is gathered, alternatives are considered.



Impact analysis

To avoid biases/inaccuracies in analysis; identify local values/preferences; assist in consideration of mitigation measures; select best alternative.



Mitigation and impact management



EIA report



Review

To consider and comment on EIA Report



Decision making



Implementation and monitoring

To monitor the implementation of EIA Report's recommendations and decision's conditions.

End of a Short Summary of EIA

- What is EIA? State its aims and objectives.
Draw the entire EIA process and describe the steps.
How the concern of public is taken account in EIA?

