

# 國立臺北大學自然資源與環境管理研究所

## 101 學年度第一學期 『環境災害與風險管理』

### 課程講義（九）：生態風險評估與社經風險評估 Ecological and Socio-Economical Risk Assessment

<http://www.epa.gov/raf/publications/guidelines-ecological-risk-assessment.htm>

Guidelines for Ecological Risk Assessment

[http://www.esd.ornl.gov/programs/ecorisk/assess\\_examples.html](http://www.esd.ornl.gov/programs/ecorisk/assess_examples.html)

Examples of Completed Ecological Risk Assessments

<http://www.econ.sinica.edu.tw/upload/file/tefp37-2-4.2008082015500967.pdf> 「防洪工程之成本效益與風險評估—以基隆河流域整治計畫為例」，臺灣經濟預測與政策，37:2 (2007), 111–137

#### ● ECOLOGICAL RISK ASSESSMENT

- What is Ecological Risk Assessment (<http://www.epa.gov/superfund/programs/nrd/era.htm>):

An ERA evaluates the potential adverse effects that human activities have on the living organisms that make up ecosystems. The risk assessment process provides a way to develop, organize and present scientific information so that it is relevant to environmental decisions. When conducted for a particular place such as a watershed, the ERA process can be used to identify vulnerable and valued resources, prioritize data collection activity, and link human activities to their potential effects.

- The Assessment Framework
  - ⇒ Problem Formulation
  - ⇒ Investigation and Analysis Phase
  - ⇒ Risk Characterization
  - ⇒ Risk Management and Communication

#### ● SOCIAL RISK ASSESSMENT

- Public Welfare or Goodwill
  - ⇒ Golden GDP and Gross National Happiness (GNH, 4 pillars of GNH are: the promotion of equitable and sustainable socio-economic development, preservation and promotion of cultural values, conservation of the natural environment, and establishment of good governance. ([Gross National Happiness](#) wiki))
- Social Risk Assessment: Poverty and Social Impact Analysis (PSIA)
  - ⇒ World Bank Guidebook: [A Users' Guide to Poverty and Social Impact Analysis](#)
- Externality: External Costs of Non-Market Goods or Socio-Economic Issues
- Environmental Impact Assessment and Cost-Benefit Analysis

Step 1: Screening Level–Problem Formulation and Ecological Effects Evaluation

- Site Visit
- Problem Formulation
- Toxicity Evaluation

Step 2: Screening-Level–Preliminary Exposure Estimate and Risk Calculation

- Exposure Estimate
- Risk Calculation

Step 3: Problem Formulation

- Toxicity Evaluation
- Assessment Endpoints
- Conceptual Model Exposure Pathways

Step 4: Study Design and Data Quality

- Lines of Evidence
- Measurement Endpoints
- Work Plan (WP)
- Sampling and Analysis Plan (SAP)

Step 5: Verification of Field Sampling Design

Step 6: Site Investigation and Data Analysis

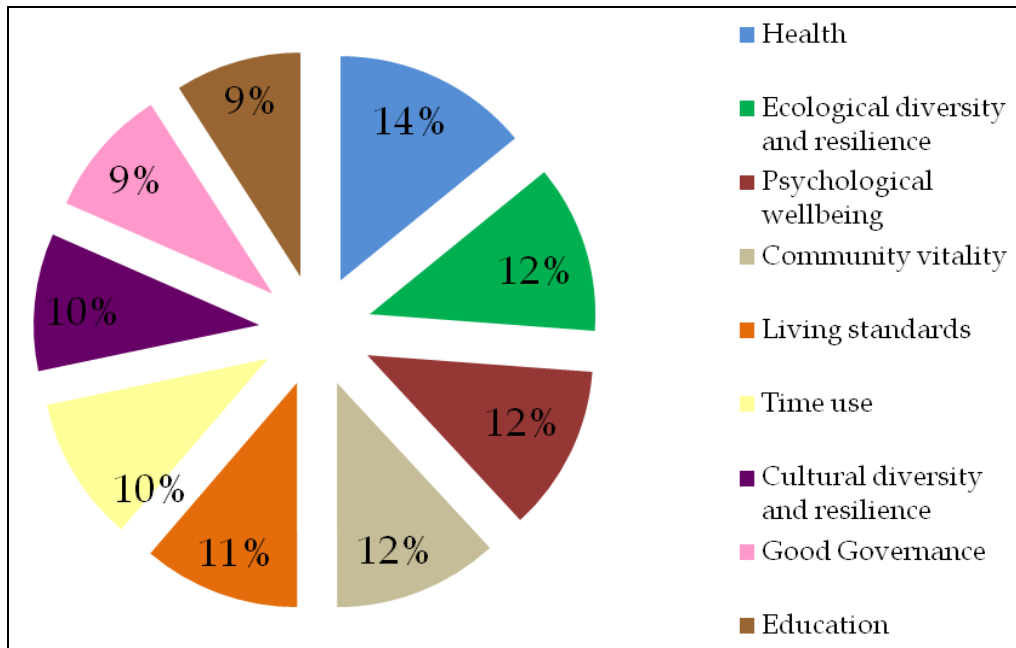
- Characterize Exposure
- Characterize Ecological Effects
- Conduct According to WP and SAP

Step 7: Risk Characterization

- Risk Estimation
- Risk Description

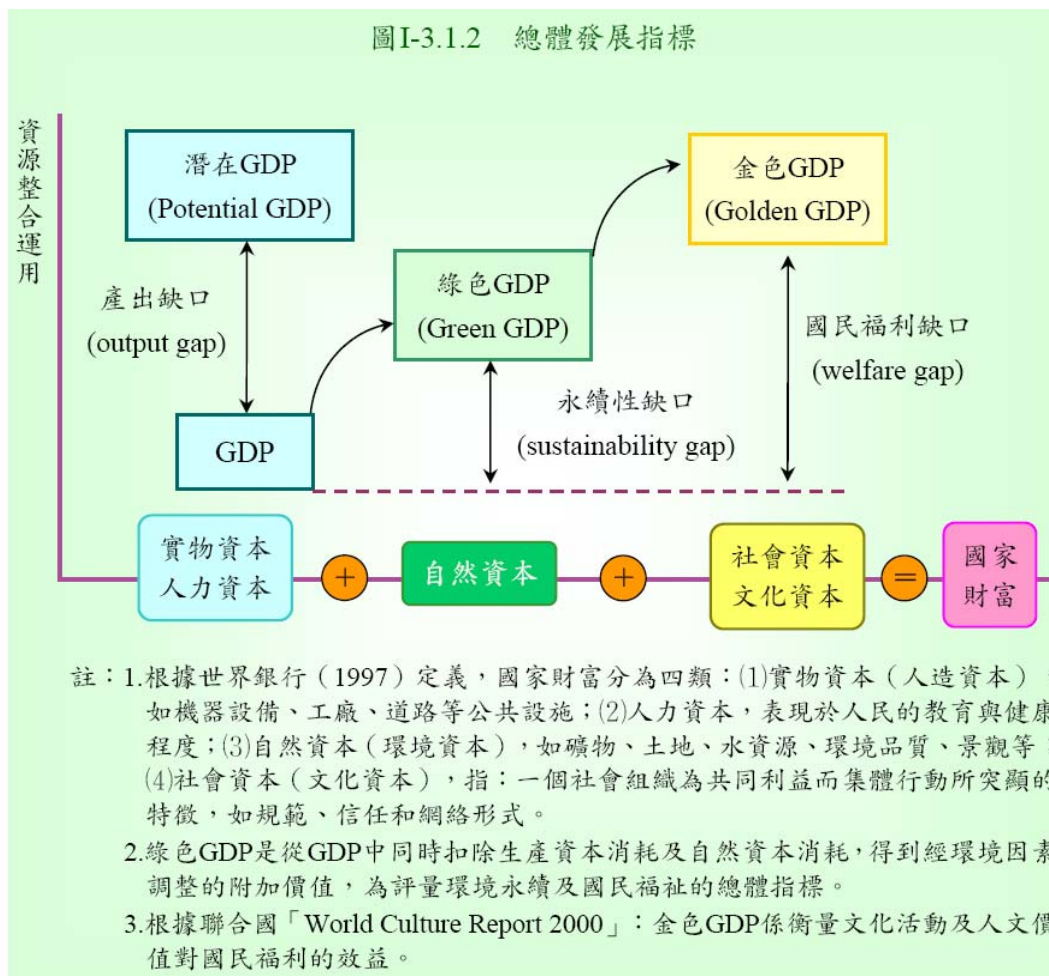
Step 8: Risk Management

- Finalize the Risk Management Decision in the Record of Decision (ROD)
- Justify decisions for remedies that may leave residual contamination at levels higher than the upper estimate of the threshold for adverse effects on the assessment endpoints.



Contribution of domains to GNH index

(<http://www.grossnationalhappiness.com/wp-content/uploads/2012/04/Short-GNH-Index-edited.pdf>)



（行政院經濟建設委員會，『新世紀第二期國家建設計畫（民國 94 至 97 年四年計畫暨民國 104 年展望）』—上篇〔築夢：發展願景、目標與策略〕—第三章：挑戰目標釐訂）