



**USAID**  
FROM THE AMERICAN PEOPLE



## **Session 9: “Impact Assessment 201”**

GEMS Environmental Compliance-ESDM Training Series  
Africa-Asia-Latin America-Middle East 2012-2014

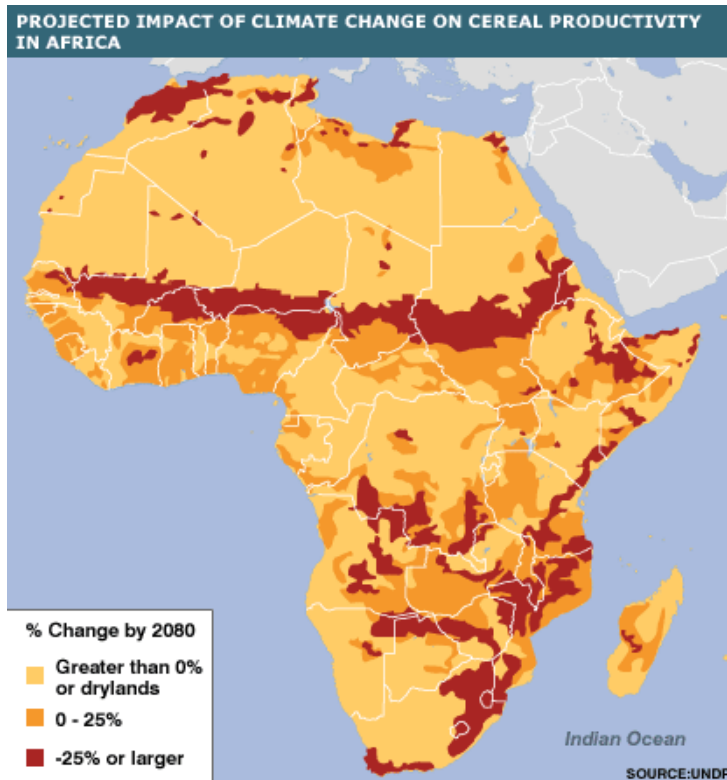


# Session Objectives:

Introduce key “beyond the basics” topics in impact assessment in 5 mini-sessions

- ✓ *Cumulative impacts*
- ✓ *Indirect impacts*
- ✓ *Ecosystem services*
- ✓ *Social impacts*
- ✓ *Addressing GCC in Impact Assessment*

These topics will be explored further in the integrative case study.



*Climate change:  
cumulative impact  
on a grand scale*

# Cumulative Impacts

impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones.



# Key points



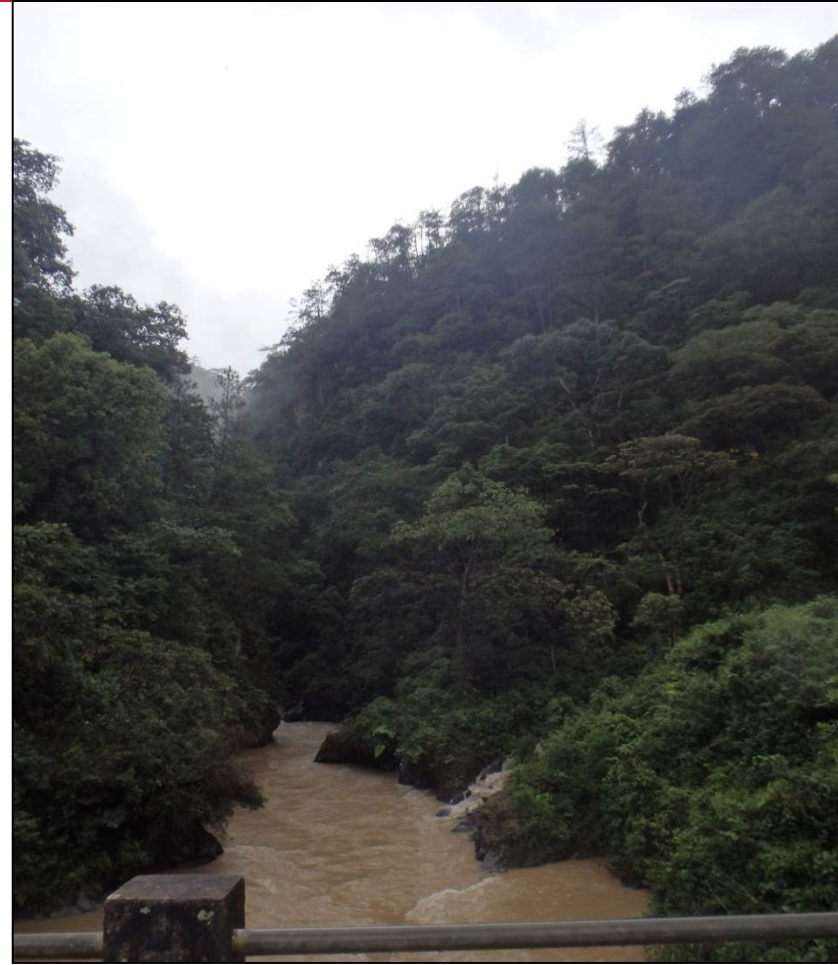
- Combined, incremental effects of human activity (spatial or temporal)
- Accumulate over time from one or more sources
- May be beneficial or adverse

*\*Individual minor actions that are insignificant on their own can collectively result in significant impacts over a period of time.*



# Examples of Cumulative Impacts

- Use of agro-chemicals on multiple small farms →  
Increases in pollutant concentrations in a surface water & sediments
- Multiple withdrawals from small irrigation schemes →  
Reduction of water flow in a watershed due to multiple withdrawals.
- Many instances of similar land use changes on small parcels of private land →  
Increases in sediment loads on a watershed and/or interference with migratory routes or wildlife movement
- Multiple logging concessions →  
Deforestation, habitat loss, increase in erosion and sediment loads in a watershed



Adapted from IFC Good Practice Handbook  
*Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (August 2013)*



# Types of Cumulative Impacts



## **Interactive :**

**Greater than the sum of individual impacts**

- **Magnification**
- **Synergistic**

## **Additive:**

**Equal to the sum of individual impacts**

# Why consider cumulative impacts?

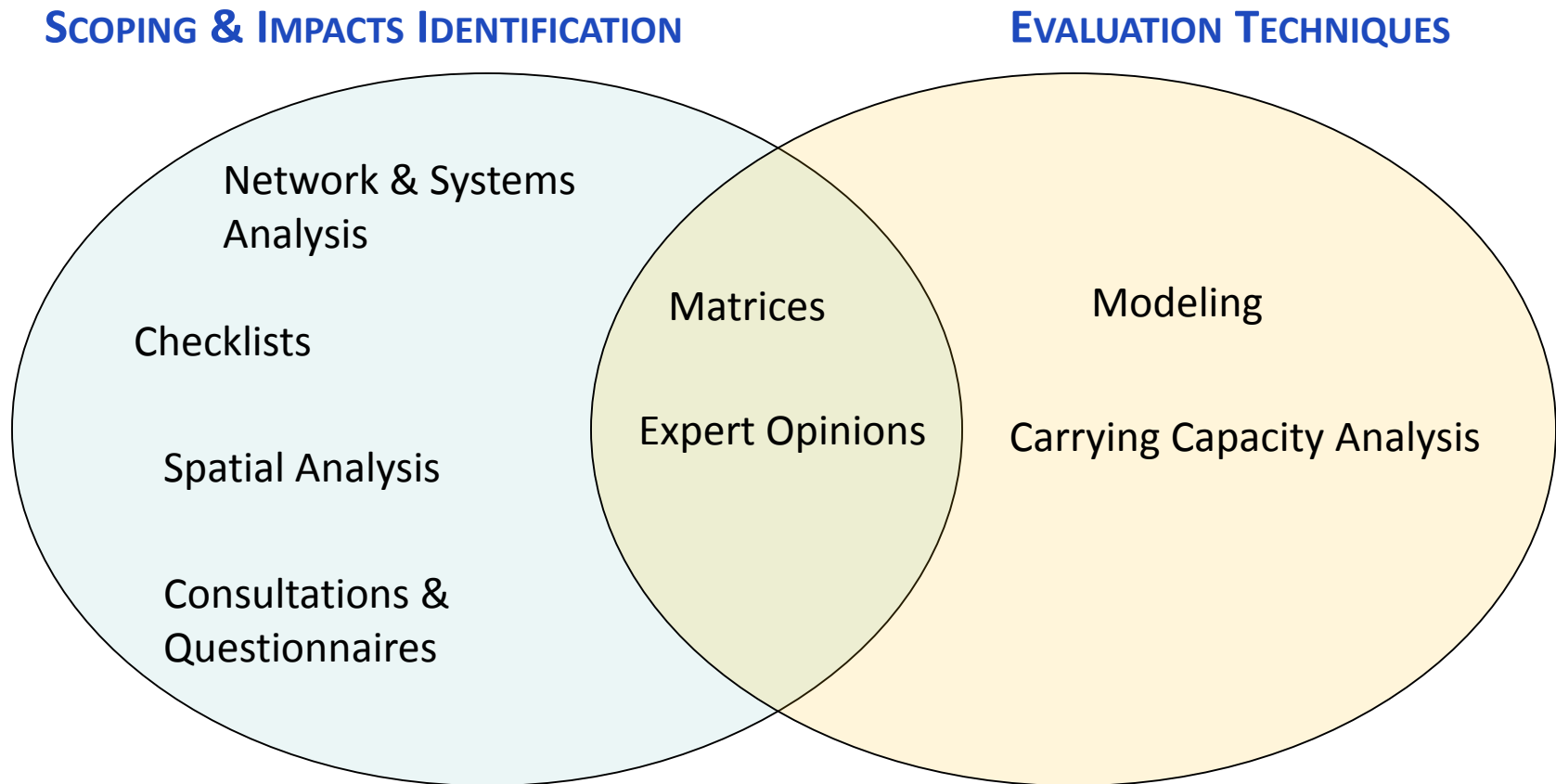
- **Required under US NEPA**
  - *And thus in 22 CFR 216 documents*
- **Required element of MDB ESIA studies**
- **Required under most host country ESIA laws and regulations**
- **Well-established element of ESIA good practice**
- **Not doing so can lead to serious failures of development**  
*even at small scales*



Source: FAO: duckweed treatment of biodegradable effluent



# What tools do we use in cumulative impact assessment?



Adapted from European  
Commission, 1999





# Uncertainties in Cumulative Impact Assessment

- ❖ **Boundaries**
- ❖ **Timeframe**
- ❖ **CIA procedure**
- ❖ **Methods**
- ❖ **Tools**
- ❖ **Data requirements**
- ❖ **Complexity of the analysis**
- ❖ **Temporal and geographic boundaries**
- ❖ **Predictive abilities**

# Summary

- ✓ **Cumulative impacts are the additive AND interactive impacts of various projects and activities on environmental and social systems, temporally and geographically**
- ✓ **Limited information or knowledge is a major challenge in cumulative impact assessment**
- ✓ **Cumulative impacts assessment should be adapted to the context.**
- ✓ **Uncertainty is part of the process.**



## Indirect Impacts

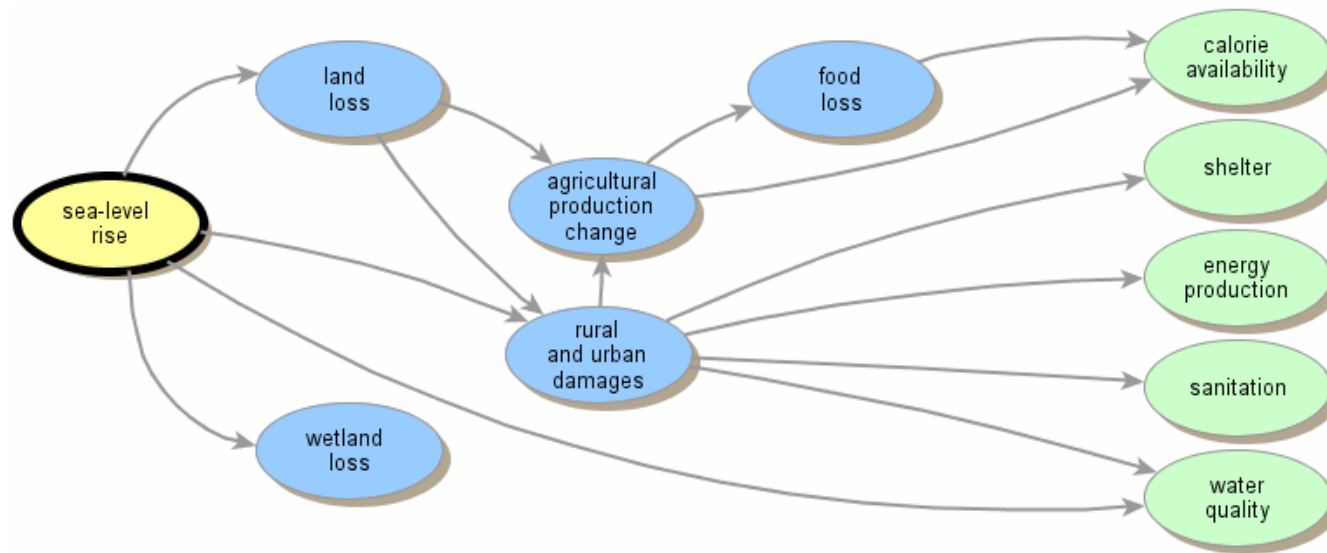
impacts that result in whole or in part from the chain of causation caused by an activity, but are not the first link in that chain.

*Market access  
road rehabilitation →  
increased illegal  
charcoal extraction*

# What do we mean by a “chain of causation”?

Chain of causation:

climate change → sea-level rise → ???



Source: ci:grasp Climate Information Service. Ci:grasp 2.0 module demonstrator. <http://www.pik-potsdam.de>



Also referred to as secondary impacts or second/third level impacts

# Indirect Impacts: Key points

- ❖ path of cause and effect (“chain of causation”) may be complex
- ❖ May be “later in time or farther in distance”
- ❖ May have other contributing causes
- ❖ Criteria for including indirect impacts in analysis is that they be reasonably foreseeable given an expert understanding of the affected environmental, social and economic systems



Source: NY Times. Fishing with LLINs in Lake Victoria.

# Examples of indirect impacts

- ❖ Improving women's education → lower birthrates
- ❖ Regulatory and policy changes to facilitate investment in the power sector →  
(1) higher economic growth, and  
(2) toxic levels of mercury in surface waters
- ❖ Creation of reservoirs for hydropower/irrigation → higher local rates of malaria
- ❖ Investment in cold stores/cold chain → higher rates of illegal fishing
- ❖ Market access roads rehabilitation → increased forest conversion & illegal extraction of timber, charcoal & bushmeat.

The “development hypothesis” behind many programs is based on beneficial indirect impacts.



# Why consider indirect impacts?

- **Required under US NEPA,**
  - *And thus in 22 CFR 216 documents.*  
*Specifically required for EAs by 22CFR216 .6*
- **Required element of MDB ESIA studies**
- **Required under most host country ESIA laws and regulations**
- **Well-established element of ESIA good practice**
- **Not doing so can lead to serious failures of development**  
*even at small scales*





# Ecosystem Services

Any positive benefit that wildlife or ecosystems provides to people. These benefits can be direct or indirect – small or large





# Ecosystem Services: 4 Main Categories

provisioning services

regulating services

cultural services, &

supporting services

**Provisioning Services:**

benefits provided by the physical extraction or harvesting of a resource

E.g., food, drinking water, timber, fuel wood, plants that can be made into textiles or pharmaceuticals.





# REGULATING SERVICES

**Benefits provided by ecosystem processes that moderate natural phenomena.**

**e.g., water purification;  
erosion and flood control;  
carbon storage and climate  
regulation**



Mangroves & coral reefs provide important regulating services: protection of coastlines, dissipation of storm surge.



# CULTURAL SERVICES

**“A non-material benefit that contributes to the development and cultural advancement of people including,**

- *Roles of ecosystems in local, national and global cultures;*
- *Building of knowledge and spreading of ideas;*
- *Creativity born from interactions with nature (music, art, architecture, etc.)*
- *Recreation*

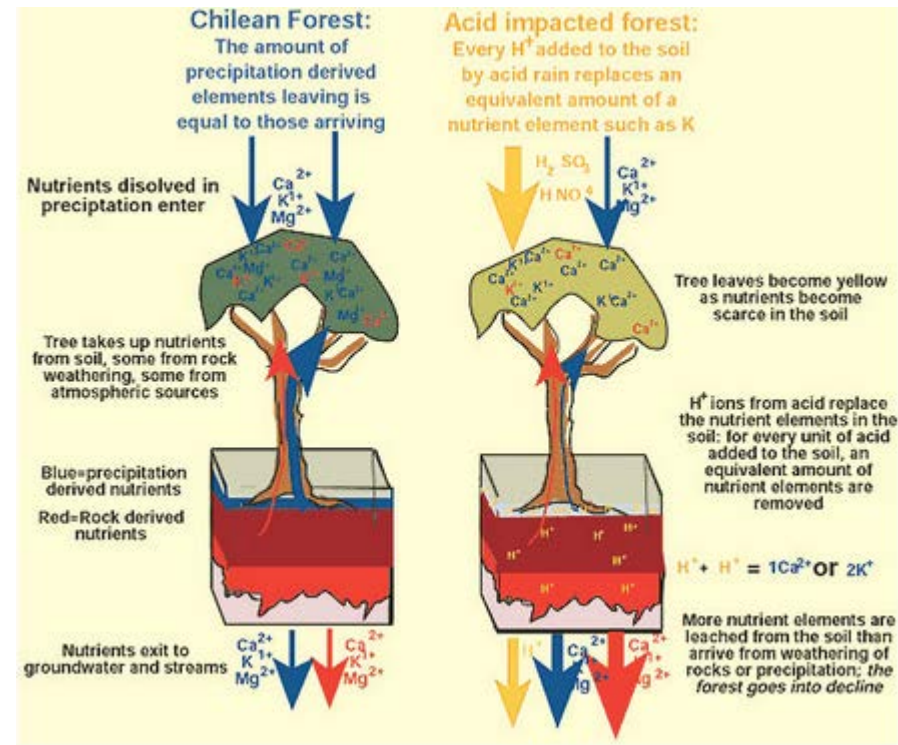


# SUPPORTING SERVICES

Ecosystems themselves could not be sustained without the existence and integrity of underlying natural processes, such as photosynthesis, nutrient cycling, soil creation, and the water cycle.

With these **supporting services**, provisional, regulating, and cultural services cannot exist!

**Human actions can disrupt and degrade supporting services.**



[www.learner.org/](http://www.learner.org/) Annenberg Foundation



# Wetlands: Multiple, Critical Ecosystem Services

- ❖ Many important food fish spend at least part of their lifecycle in wetlands
- ❖ Wetlands retain and control flood waters
- ❖ Wetland plants absorb nutrients and chemicals from water and act as a natural filtration system
- ❖ Wetland soils store large amounts of carbon, that, if released will contribute to global climate change.
- ❖ Vital habitat for migratory species.



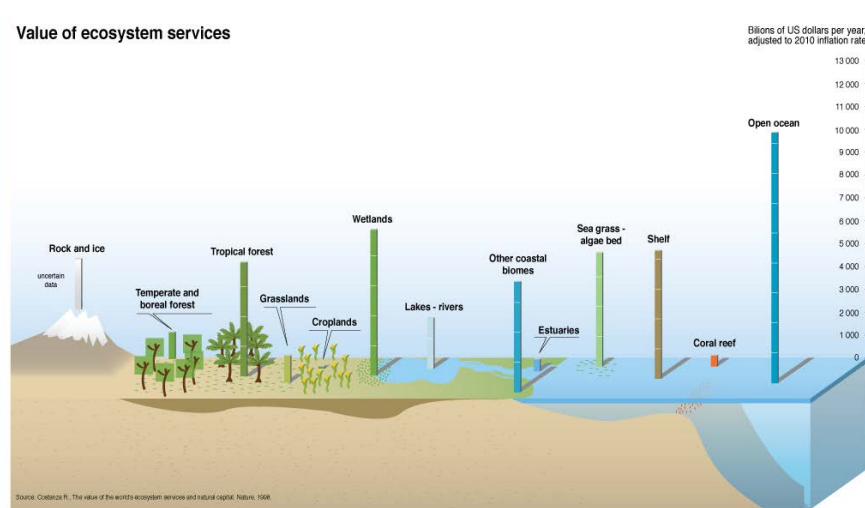
# Ecosystem services, impact assessment & valuation

**In any IA process, adverse impacts on ecosystem services must be identified and assessed.**

**At the full EIA study level, requires VALUATION.**

Many approaches for valuation of ecosystem services. Often based on an ecological-economic model

Results are used to evaluate potential losses/gains of ecosystem services relative to a proposed project



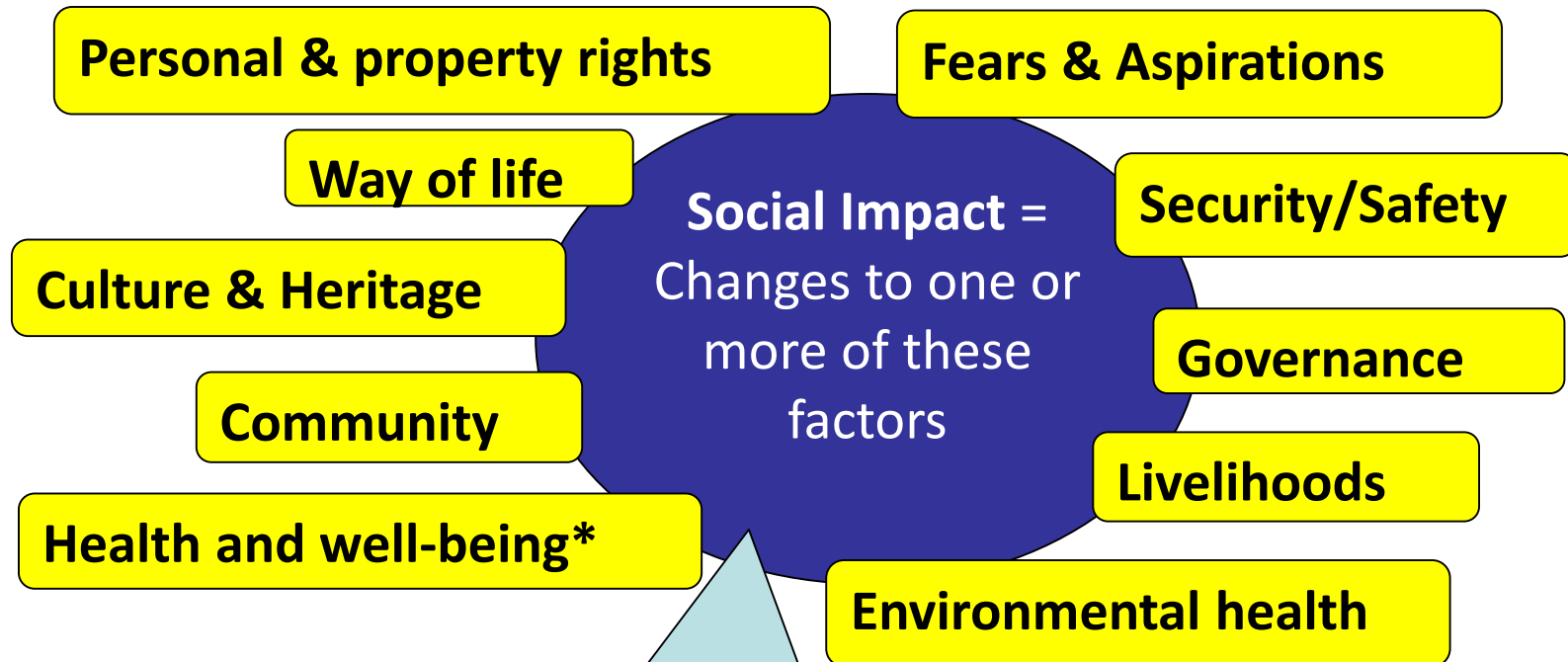


## Social Impacts

The effect of an activity on the social fabric of affected communities and the well-being, economic and otherwise, of individuals and families.

*Forced relocation is a significant social impact, no matter the cause*

# Types of Social Impacts



With particular attention to how a factor changes for groups/communities who are often disadvantaged: indigenous peoples, women and children, minority groups, etc.

•Including Worker and Community Health & Safety; safety from crime, etc.



# What is social impact assessment?

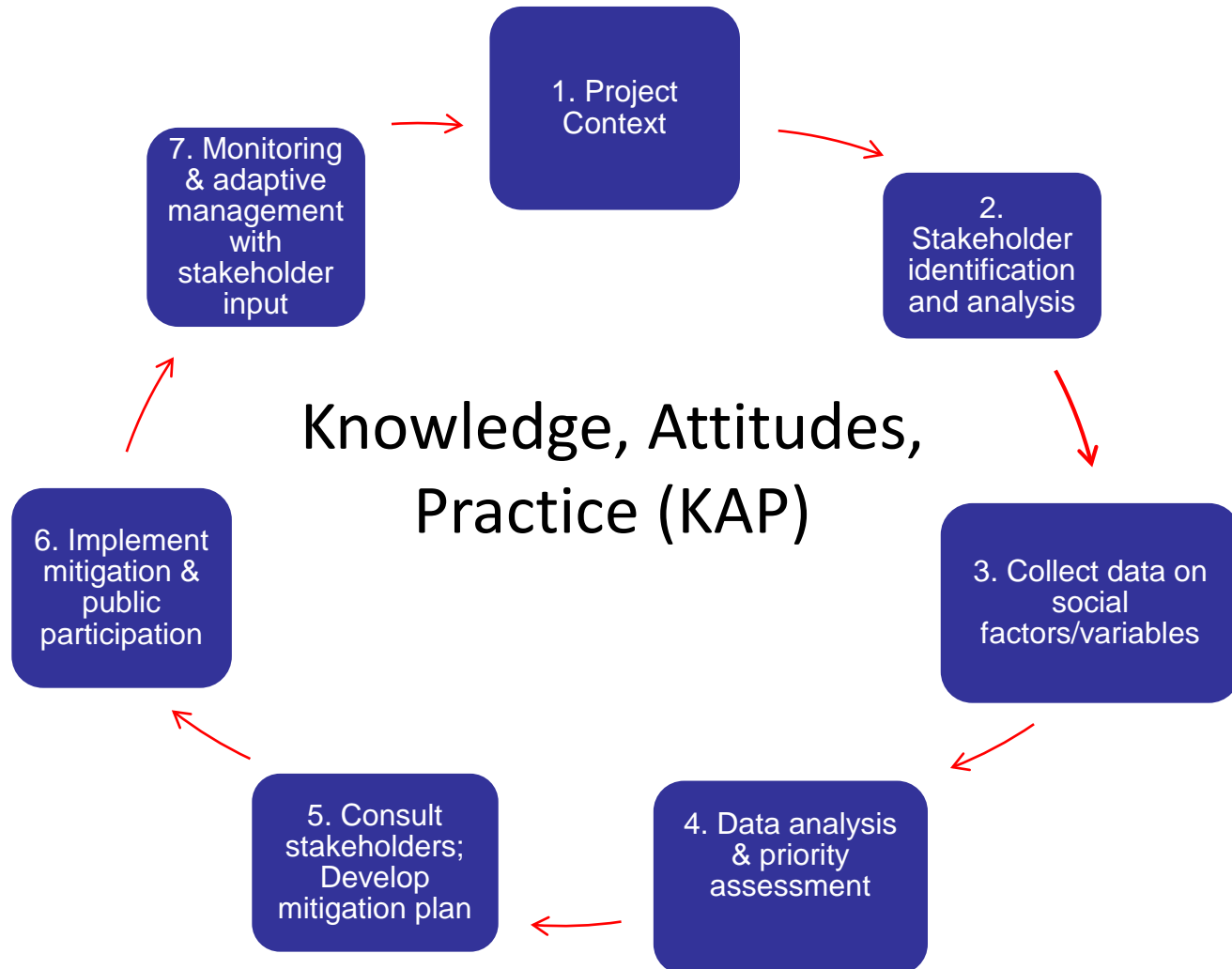


**A framework to assess or estimate, in advance, the social impacts (both beneficial and adverse) likely to result from projects, programs, policies or activities.**

**May be integrated with EIA (ESIA) or a distinct exercise**



# Social Impact Assessment Process





# Why social impact assessment?

- ❖ **Assessment of social impacts required under US NEPA**
- ❖ **Most host country procedures require that both social and (biophysical) environmental impacts be assessed**
- ❖ **MDB requirements are for fully integrated ESIAs**
- ❖ **USAID requirements**
  - *22 CFR 216.6(a) Environmental Assessments s (“urban quality, historic & cultural resources and the design of the built environment.”)*
  - *22 CFR 216.7(b)(i) Pesticide Procedures (health risks)*
  - *ADS 201 Integrating Gender into Health Programs*
  - *ADS 205 Integrating Gender Equality and Female Empowerment in USAID’s Program Cycle*

**Gender analysis is  
one dimension of  
SIA**



# Climate Change & (E)IA

Climate change = change in  
baseline conditions.



# Key points

Very few projects will produce or prevent GHG emissions that make a significant change to global totals.

## However, sound IA practice requires:

- **Factoring likely GCC-driven changes into future baseline conditions**
- **Evaluating the significance of impacts in light of these changes**
  - *E.g. watershed withdrawals by an irrigation scheme may be sustainable now --- but what if GCC is expected to reduce water availability?*
- **Identifying opportunities for GHG mitigation, consistent with activity objectives**
  - *Quantify GHG emissions & reductions if above threshold.*
- **Considering whether the proposed actions/ design choices are robust to anticipated changes in baseline conditions—and identifying measures to make them moreso.**
  - *Why? Because environmentally driven project failure will be an adverse social impact.*

# Illustration: pumped irrigation w/ groundwater



## **CC now being observed:**

**slightly hotter temperatures;  
slightly more variable and less overall rainfall**

## **IA should identify:**

**Irrigation needs will increase. With project withdrawals, negative synergistic effects on groundwater recharge will likely occur.**

## **CC 20-50 years out:**

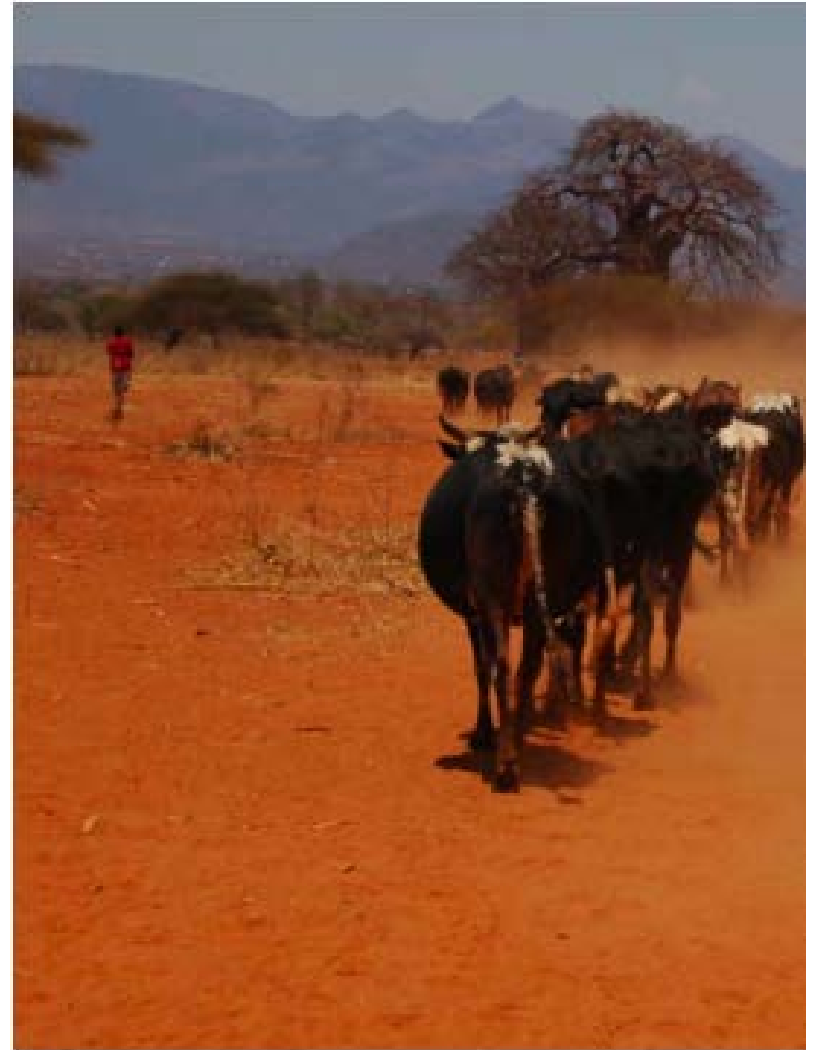
**much hotter temperatures,  
highly variable and less rainfall**

## **IA should identify:**

**Higher capacity irrigation system needed but groundwater not always available. Target crop no longer suitable for climate zone.**

# Sound IA practice with respect to GCC has multiple benefits

- Quantify emissions and reductions: achieve climate objectives
- Compliance with applicable laws, regulations & mandates
- Better assure design for resilience of projects to a changing climate
- Better assure projects are contributing to low or no emissions development and making people less vulnerable to climate change.



# Resources: Cumulative impacts

- ❖ IFC, Good Practice Handbook: Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets, August 2013  
[http://www.ifc.org/wps/wcm/connect/3aebf50041c11f8383ba8700caa2aa08/IFC\\_GoodPracticeHandbook\\_CumulativeImpactAssessment.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/3aebf50041c11f8383ba8700caa2aa08/IFC_GoodPracticeHandbook_CumulativeImpactAssessment.pdf?MOD=AJPERES)
- ❖ U.S. Council on Environmental Quality  
<http://ceq.hss.doe.gov/NEPA/ccenepa/ccenepa.htm>
- ❖ The World Bank  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/0,,contentMDK:20742999~pagePK:148956~piPK:216618~theSitePK:244381,00.html>
- ❖ IAIA CEA Wiki <http://www.iaia.org/iaiawiki/cea.ashx>
- ❖ Cumulative Effects Assessment Practitioners Guide (Canada)  
[https://www.ceaa-acee.gc.ca/Content/4/3/9/43952694-0363-4B1E-B2B3-47365FAF1ED7/Cumulative\\_Effects\\_Assessment\\_Practitioners\\_Guide.pdf](https://www.ceaa-acee.gc.ca/Content/4/3/9/43952694-0363-4B1E-B2B3-47365FAF1ED7/Cumulative_Effects_Assessment_Practitioners_Guide.pdf)



# Resources: Ecosystem Services

- ❖ Costanza R et al. 1997. The value of the world's ecosystem services and natural capital.  
[http://www.esd.ornl.gov/benefits\\_conference/nature\\_paper.pdf](http://www.esd.ornl.gov/benefits_conference/nature_paper.pdf)
- ❖ Costanza R. 2014. Changes in the global value of ecosystem services.  
<http://www.sciencedirect.com/science/article/pii/S0959378014000685>
- ❖ USAID. 2007. Payment for Ecosystem Services Handbook.  
<http://www.oired.vt.edu/sanremcrsp/wp-content/uploads/2013/11/PES.Sourcebook.pdf>
- ❖ USDA Valuing Ecosystem Services 2015  
<http://www.fs.fed.us/ecosystemservices/>
- ❖ US EPA. 2014. Ecosystems Research: Ecosystem Services  
<http://www2.epa.gov/eco-research/ecosystems-services>
- ❖ UNEP. Ecosystem Services Economics. 2012.  
<http://www.unep.org/ecosystemmanagement/UNEPsWork/EcosystemServicesandEconomics/tabid/514/Default.aspx>
- ❖ WAVES. 2015. Wealth Accounting and Valuation of Ecosystem Services.  
<http://www.wavespartnership.org/en/about-us>

# Resources: Social Impacts & SIA

- ❖ **World Bank Environmental Assessment Sourcebook**  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVASS/0,,contentMDK:20282864~pagePK:148956~piPK:216618~theSitePK:407988,00.html>
- ❖ **Guide to Social Impact Assessment**  
<http://unpan1.un.org/intradoc/groups/public/documents/cgg/unpan026197.pdf>
- ❖ **Guidelines and Principles for Social Impact Assessment**  
[http://www.nmfs.noaa.gov/sfa/social\\_impact\\_guide.htm](http://www.nmfs.noaa.gov/sfa/social_impact_guide.htm)
- ❖ **UNEP Social Impact Assessment Tools and Methods**  
[http://www.unep.ch/etu/publications/EIA\\_2ed/EIA\\_E\\_top13\\_hd1.PDF](http://www.unep.ch/etu/publications/EIA_2ed/EIA_E_top13_hd1.PDF)
- ❖ **IAIA Social Impact Assessment**  
<http://www.iaia.org/iaia/wiki/sia.ashx?HL=social,impact>
- ❖ **World Bank**  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPSIA/0,,contentMDK:20415258~pagePK:210058~piPK:210062~theSitePK:490130,00.html>
- ❖ **USAID Gender Analysis**  
<http://www.usaid.gov/sites/default/files/documents/1865/201sac.pdf>