



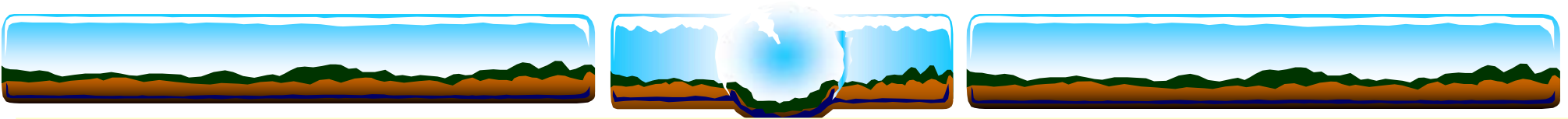
Great Asian Mountain Assessment: Towards a Conceptual Framework

Prepared by Jian LIU for the 2nd APEIS Workshop
International Centre for Integrated Mountain Development



Fact sheet– people and land

- ❖ Largest land mass in the world
- ❖ Population, 25 million up, 3 billion down
- ❖ Area: 8 million KM²



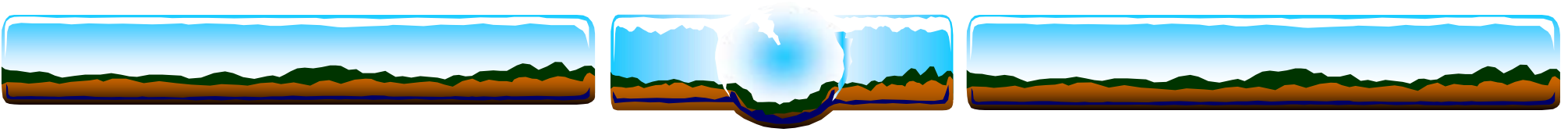
Fact sheet—15 countries encompassed

- **HKH:**

- Afghanistan
- Bangladesh
- Bhutan
- China
- India
- Myanmar
- Nepal
- Pakistan

- **CA:**

- Kazakhstan
- Kyrgyzstan
- Mongolia
- Russia
- Tajikistan
- Turkmenistan
- Uzbekistan



Fact sheet–8 environmental services

1. Sources of water as the birthplace of many large rivers such as Indus, Ganges, Yangtze, Mekong, Yellow, Yaluzanbu, Amudarya, Syrdarya, Ili, Irtysh and Aksu...
2. Cold source and carbon sink
3. Regional and global climate regulation
4. Genetic resources
5. Food and other agricultural products
6. Indigenous knowledge of best practice
7. Cultural and spiritual assets
8. Recreational sites



What is wrong here?

- **Poverty and environment spiral?**
- **The global context?**
- **How to incorporate environmental management into poverty alleviation?**
- **A conceptual framework?**
- **Where are we now?**
- **Where to start?**



The spiral: environment and poverty

- ❖ Mountain environment
- ❖ Highland poverty

Mountain environment

•Most sensitive to GC



De-glaciation/shrinking permafrost

Ecosystem degradation

Resource depletion

More natural disasters

(floods and landslides)

**Poverty: Half of world poor in Asia,
those in highland the poorest, hidden emergence!**

- **Food insecurity**
- **Low income**
- **Physical vulnerability**
- **Inaccessibility**
- **Resource Scarcity**
- **Marginality**

Environment-dependent livelihood
Resource-based economy



The spiral: environment and livelihood

- ❖ Global change, glacier and water
- ❖ Land and carbon
- ❖ Biodiversity



Environment and livelihood:

Global change, glacier and water

- ❖ Global warming (2050): De-glaciation (27%) and permafrost reduction (10-15%)
- ❖ More floods and draughts, landslides, difficult infrastructure construction,
- ❖ Farmland, grassland and forest ecosystem degradation, biodiversity/productivity reduction (besides anthropogenic causes)
- ❖ Scarcity/vulnerability/inaccessibility increase



Environment and livelihood: Land and carbon

- ❖ **Food insecurity**, low income and resource scarcity cause:
- ❖ Marginal land cultivation: susceptible to water loss and soil erosion, soil fertility depletion, and desertification, yet hard to restore
- ❖ Carbon loss
- ❖ Productivity decreases, **food insecurity**....



Environment and livelihood: Biodiversity

- ❖ Biodiversity reduction means less opportunity for local people's livelihood:
 - ❖ Aromatic and medicinal plants,
 - ❖ Natural beauty reduction,
 - ❖ Less off-farm opportunities, tourism
 - ❖ Low productivity



Poverty and environment

Downward spiral?

Innovative way out?



Global context

- ❖ Int'l campaign against poverty and environmental degradation
- ❖ Bishkek Global Mountain Summit
- ❖ Past experiences
- ❖ Generic knowledge gaps



Int'l campaign

- ❖ **MDGs:** “eradicating extreme poverty and hunger” and “ensuring environmental sustainability”
- ❖ **WSSD:** “eradicating poverty is the greatest global challenge”, and “managing the natural resources base in a sustainable and integrated manner is essential.”
- ❖ **DFID-EC-UNDP-WB:** Linking poverty reduction and environment management
- ❖ **CIDA:** “poverty is a persistent and daunting challenge, ... and severe environmental degradation undermines progress.”



Bishkek Global Mountain Summit

- ❖ The need for scientific evidences to support
- ❖ international environmental agreements for mountain regions,
- ❖ which should lead to policy frameworks and institutional mechanism
- ❖ that meet particular needs of mountain people and the ecosystem.



Past experiences

- ❖ EU: Environmental Sensitive Areas (ESA) and Countryside Stewardship Scheme (CSS),
‘society could pay farmers to produce countryside instead of food (1969)’
- ❖ US: Conservation Reserve Program (CRP),
- ❖ China: Set-aside and compensation policy (40 bi),
- ❖ Costa Rica: PES (US\$ 32.6 mi WB+ 8 mi GEF)
- ❖ ...



Generic knowledge gaps and political legitimacy

- ❖ How to identify environmental services
 - ❖ How to measure them?
 - ❖ How to value them?
 - ❖ Transboundary?
 - ❖ Legitimacy?



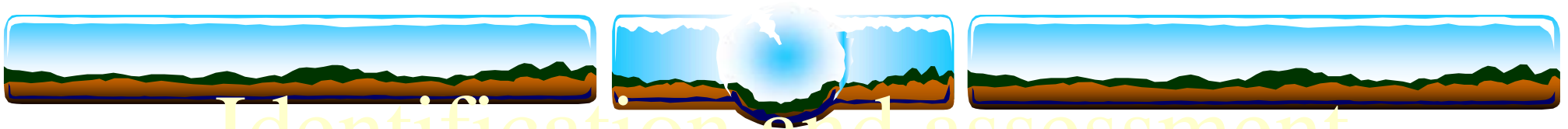
Incorporating environmental management into poverty alleviation

- ❖ The role of environmental services
- ❖ Identification and assessment
- ❖ Valuation
- ❖ Incentives and trade-offs



The role of environmental services at different scales

ES	Global	Regional	Local
Glacier	Cold source	Water	Water
Water	Regulation	Hydro/resource	Livelihood
Biodiversity	Gene ?	Gene ?	Food/income
Ag-produce	Specific goods ?	Specific goods ?	Food/income
Carbon	Sink ?	Climate ?	?
Landscape	Heritage/tourism	Heritage ?	Income ?
Culture	Heritage ?	Heritage ?	Income ?



Identification and assessment

- ❖ Scoping and assessing ES:
 - ❖ Provisioning: food, fuel, water, tour site, medicine...
 - ❖ Regulating: cold source, carbon sink, water flow, atmospheric circulation
 - ❖ Supporting: biodiversity...
 - ❖ Cultural: indigenous knowledge, region, aesthetic...
- ❖ Predicting ES change and consequences on livelihood
- ❖ Assessing impact of poverty alleviation practice on the environment



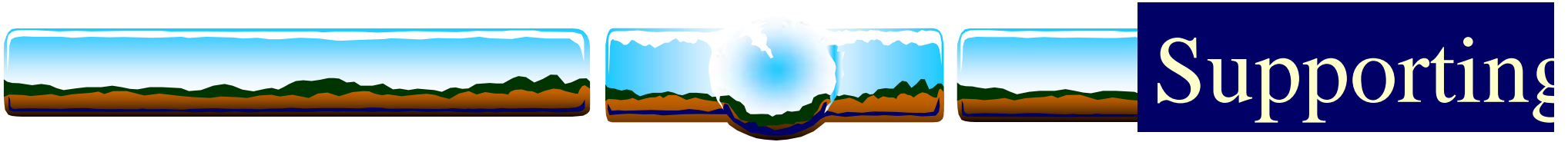
Method inadequacies

- ❖ MA, IPCC, WB, UNDP, ICRAF???
- ❖ Relatively easy to assess the PROVISIONING, yet
- ❖ Absolutely difficult to measure: Regulating, Supporting and Cultural

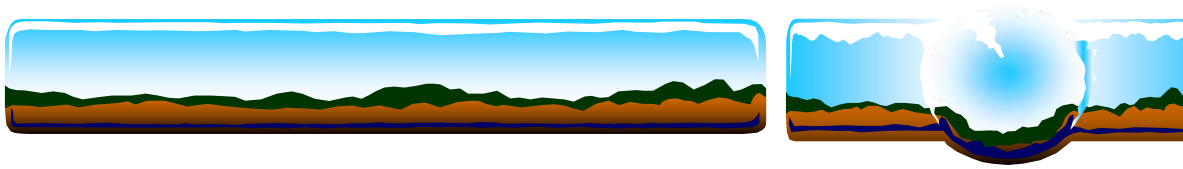


Regulating

- ❖ Cold source:
 - ❖ Glacier/permafrost mass balance monitoring
 - ❖ Thermal dynamics: glacier mass-temp.-carbon
- ❖ Carbon sink:
 - ❖ Soil organic matter measurement
 - ❖ Dynamic monitoring and modelling carbon flux: soil-air, vegetation-air, water-air, ...
- ❖ Water flow:
 - ❖ Max-mean-mini water flow
 - ❖ Watershed ecosystem health indicators and water use...
- ❖ Atmospheric circulation: ???

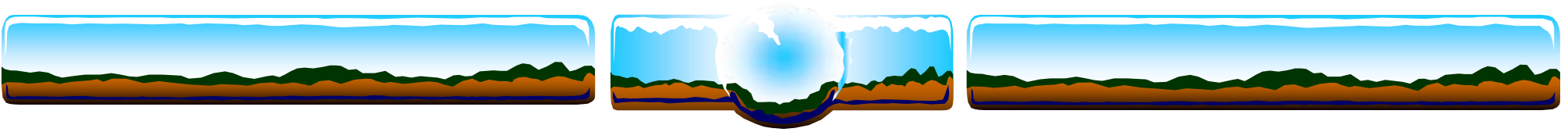


- Key: species diversity, yet much more beyond!
- Ethical, ecological, economic, cultural and aesthetical as defined by GMBA steering committee, yet,
- How to quantify? Incredibly difficult!



Cultural?

- Quantification?
- Integration into the whole valuation and modelling process?



ES scenario

- ❖ Scenario analysis limited only to provisioning, and part of regulating services
 - ❖ *Productivity, water resource availability and income growth can be projected*
 - ❖ *Glacier mass balance, carbon flux etc. can be measured and future trend can be estimated*
 - ❖ *Biodiversity ?*



Impacts of poverty alleviation

- ❖ Poverty alleviation practice can be measured, e.g. building terraced land, set-aside, diversification of farming activities, off-farm activities, afforestation...
- ❖ Increase of carbon store, soil fertility, biodiversity can be measured both at local, river basin and regional level...



Valuation

- ❖ We have been able to use energy and nutrient flow in modelling ecosystem change in 1980's
- ❖ Can we use money flow to model environment services and develop a payment and/or incentive mechanism?



Incentives and trade-offs: vision

- ES is public goods, payment should be made mainly by government, downstream to upstream is not likely to happen;
- Government compensation will make a difference in trade-offs, yet
- Private sectors can play a part in carbon sequestration (carbon trade?).

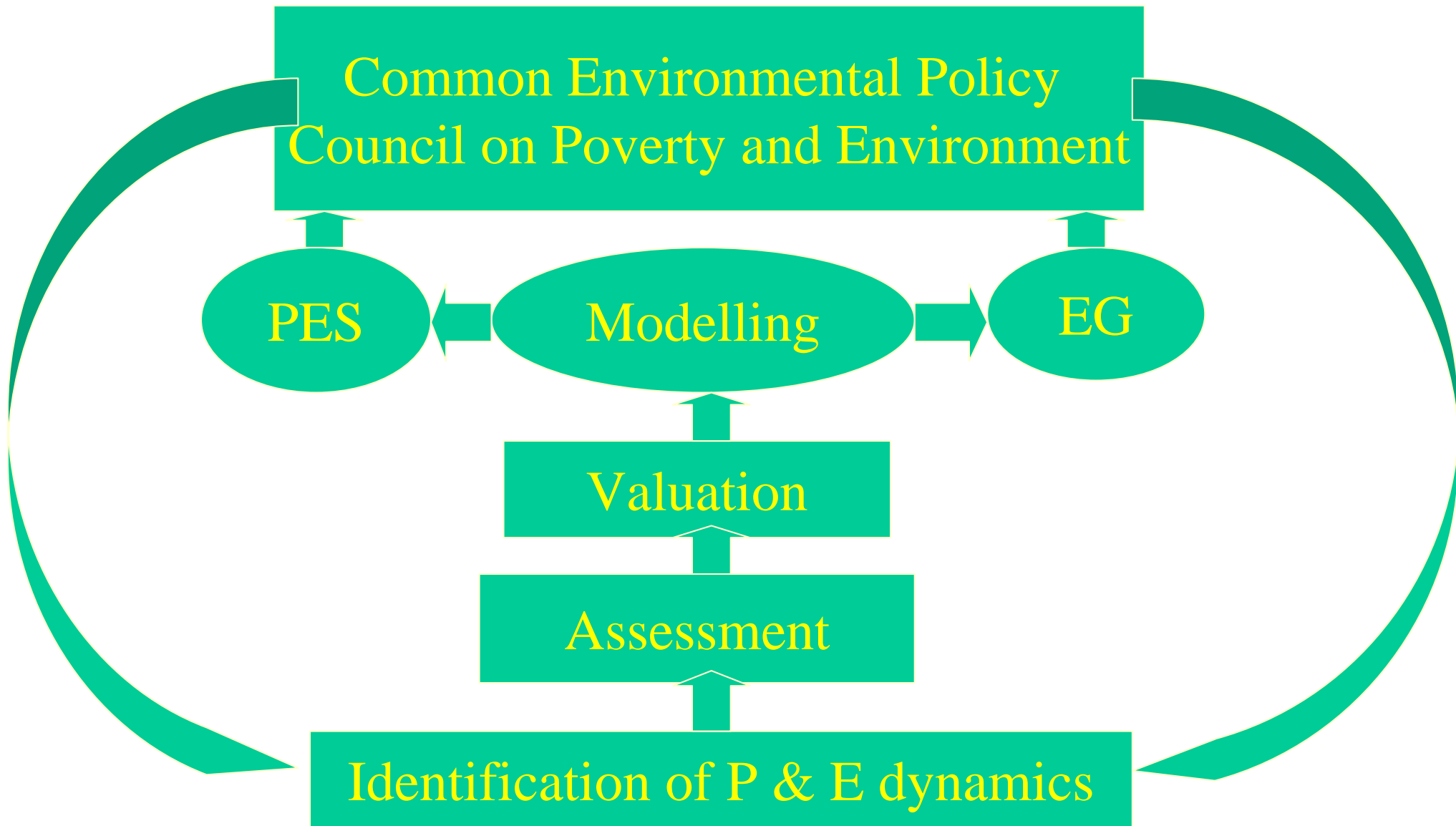


Incentives and trade-offs: principles

- ❖ Mountain environment is the common property of the mountain people;
- ❖ Incentives/Trade-offs can be built into the sequence of Subsistence—Production—Environment in Mt. region



Towards a conceptual framework





Where are we now?

1st GAMA inception workshop, MA-ICIMOD

❖ Agreed core set of services:

❖ Water

❖ Biodiversity

❖ Soil

❖ Agreed cross-cutting themes:

❖ Climate change as a driver

❖ Poverty alleviation

❖ Epistemological issues



Agreed (cont.)

- ❖ GAMA will encompass 15 countries, but:
- ❖ start with six sub-global assessments in the region
- ❖ Work with stakeholders

- ❖ Working group established
- ❖ Road map for integration and project devt.

Where to start? mountain water initiative

- Glacier-wetland/lakes-rivers, IRBM approach
 - Wetland ecosystem services assessment
 - Highland lake initiative
 - Linking to livelihoods upstream & downstream
-
- **Initial partnership: ICIMOD, Ramsar, WWF, IUCN, NIES, ITC, TMI, WI and 8 countries**
 - **Potential partners: UNEP, GEF and 7 countries**
 - **Welcome interested partners!**



The role of ICIMOD in APEIS

- ❖ A regional inter-governmental R & D organization addressing poverty and environment in HKH
- ❖ Provides gateway to APEIS in HKH region legitimately, and in Central Asia thru GAMA
- ❖ Technically receptive to APEIS thru MENRIS
- ❖ Great potential for a strengthened partnership!



Thank you !