Understanding building blocks of regional transformation

Adapted from: Brondizio 1999; 2006; 2008; 2013; 2014
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“Integrated Science for Sustainable Transitions”

International Institute for Applied Systems Analysis (IIASA) and the International Geosphere Biosphere Programme

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Problem-oriented definitions: Alignment, Interdependencies, and Fit:
Ex: Settlement vulnerability  Fisheries management  Pollution-Sedimentation dynamics
Resource flows  Rainfall-flooding dynamics  Infrastructure impact  Epidemiology ETC

Social-Economic Systems
Urban-Rural demography
. Physical infrastructure
. Economic systems
. Market networks
. Sociocultural arrangements
. Services, Public goods

Governance Systems
. International basin
. Administrative units
. Property regimes
. Resource rights

Ecosystems/Resource Systems
. Land Cover types
. Aquatic and Terrestrial ecosystems functioning
. Biodiversity

Topographic Hydrological Systems
Local to basin
. Rainfall/catchment area
. Seasonal climate regimes

Oceanic-Climate Systems
. Oceanic/tidal influence
. Currents
. Weather influences

Spatial-Temporal Coupling
Sociodemographic Telecoupling
Migration-Circulation
Rural-Urban networks

Economic Telecoupling
Market chains
Resource circulation

Ecological Telecoupling
Population flows
Biogeochemical cycles

Material Telecoupling
Sediment flows
Pollution flows

Climate-Hydrological Telecoupling
Rainfall-flooding
Ocean currents-coastal interactions

Boundary definition

Social-Ecological System (SES)

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Boundary definition

Social-Ecological System (SES)
Daily tidal flooding

Month/Lunar cycles

Seasonal rainfall and flooding patterns

Inter-Annual climate

El Nino/El Nina

Riverine-Coastal communities

Estuary-Delta Municipalities

Watersheds

Pollution flow

Population distribution

Resource circulation

Inter-Annual basin-level

Inter-state

Spatial-lag Coupling Interactions

Time-lag Coupling Interactions

Interactions

North/South Channels

Flooding and Salinity

Fish migration

Sediment flows