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1 BASIC SCIENTIFIC QUESTIONS

Lot of scientific information is out there that may already serve holistic approaches

Equations
Computer power (available date – fluxes, ecology – human dimensions – behaviors and change)

So far rather physical discussions

Nutrient processes in the Landscape – hydrologically / sediment fluxes / source to sea – importance of Deltas
Spit formation, Lagoon interaction, implications for materials and transports

What are the BASIC MASS BALANCES in nutrient and sediment fluxes, budgets (can we usefully do that across multiple Deltas?)

SEDIMENT TRANSPORT SYSTEMS, TIME SERIES, IDENTIFY BASIC SEDIMENT DYNAMICS to SUSTAIN THE DELTA GEOMORPHOLOGY

WHAT IS THE SCALE OF BASIC DELTA FUNCTIONS?
WHICH PROCESSES FORM DELTAS AND HOW DO WE MODEL THEM
How do these processes influence humans

ARE DELTAS HUMAN ARTIFACTS?

4 dimensional modeling
PHYSICAL MODELLING

Combine different timescales and sediment transport system functions
Look into sediment dynamics subject to system characteristics (tidal, wave, fluvial, human)

Understand the self-organization (Internal dynamics of the systems) problems between biological and physical systems

LOSS OF LAND SURFACE (Impact of surges, decision to live, subsidence, sea level, water abstraction, waste)

CAN WE BRING DELTAS TO HIGHER ELEVATION / ALTERNATIVE MITIGATION MEANS Can we solve land surface loss – can we fix it?

General issue of Delta – catchment system coupling (incl. HD)

There is a place for simple models – spreadsheet to be distributed to decision makers

MULTIPLE CLASSES OF MODELS / CSDMS

EVALUATE USE OF EXISTING MODELS

STANDARDIZED COLLECTION FOR DATA

Identify the timeframe where you start off with a pristine delta and when

HOW TO BRING IN THE HUMAN DYNAMICS INTO BIO-PHYSICAL SCIENCE?
(characterization of people, behavior, gauge preferences etc.)

WHERE ON DELTAS DO PEOPLE LIVE AND WHY?

SOCIO ECOLOGICAL SYSTEMS APPROACH TO DEFINE BASELINE OF DELTA SYSTEM FUNCTIONING

GOVERNANCE SYSTEMS What governs human decisions to stay or withdraw,

HOW DO DIFFERENT CULTURES, VALUE SYSTEMS, BEHAVIOURS, GOVERN DECISIONS TO LIVE IN DELTA REGIONS – Societal preferences, different knowledge bases (ex. Traditional and local knowledge), history, history of scientific work, and societal preferences

HOW DO GLOBAL PROCESSES INCL. LAND OCEAN INTERACTIONS anthropogenic influences and macroprocesses overlay with the microprocesses

Continued Discussion:
DOES CONFERRING PROTECTED AREA STATUS ACHIEVE ITS GOAL?

HOW DO DYNAMICS IN THE DELTA FEEDBACK INTO CHANGES OF VULNERABILITY (TO FLOODING FOR EXAMPLE)?

HOW CAN AND SHOULD HUMANS ALTER THOSE AND HOW WILL WE DECIDE?

AT WHAT SCALE DO WE EFFECTIVELY MANAGE TO PROTECT OR PRESERVE?

WHAT LEGAL MECHANISMS AT ALL GOVERNANCE SCALES EXIST FOR MANAGEMENT OF DELTAS AND HOW EFFECTIVE ARE THEY?

TAKE A TYPOLOGICAL APPROACH TO DELTA CLASSIFICATION TO HELP PRIORITIZE THE KEY PRIORITY

Physical
Good and services
Use functions
Governance instruments
Cultural values, etc.

WHATS THE DISTRIBUTION OF DELTAS OF CERTAIN SIZE AND COMPLEXITY – COMPARATIVE ANALYSIS

WHAT SPATIAL STRUCTURS (SIZE, COMPLEXITY) AND FUNCTIONS MAINTAIN TARGET FUNCTIONS (SURFACE SYSTEM all FLUXES) –
i.e. look into the FRACTAL DIMENSION
(e.g. RSA water act, environmental fluxes)

2 VULNERABILITY OF DELTAS - TO AND FROM HUMANS – SOCIO ECOLOGICAL SYSTEMS PERSPECTIVE

WHAT DO WE WANT FROM POLICY AND DECISION-MAKERS

Definition of Health (WHO def. for example, cultural)
Definition of Vulnerability
General Valuation Questions incl. Ecosystem Goods and Services
Relative Vulnerabilities example: gender, age, disability, minority

Key Question:

CAN WE PROVIDE SCIENCE TO INFORM BEHAVIORAL CHANGE?

THE ROLE OF RISK AND ITS EVALUATION? – Deliverables that people may use to evaluate risk to themselves, which includes:

COMMUNITY BASED AND PARTICIPATORY PROCESSES AIMED TO CAPTURE CULTURAL DIFFERENCES IN RISK PERCEPTIONS

COMPARING NATURAL VERSUS ANTHROPOGENIC FORCING TO GET QUANTIFIABLE INFORMATION OF SYSTEM VULNERABILITY (E.G. SUBSIDENCE)
Magnitude of expected change divided by magnitude of natural variability – offer target information of vulnerability

PROVIDE COMPARISON ACROSS ALL RELEVANT FACTORS – EMPLOY SCENARIO ANALYSIS:
these Scenarios can be based on governance or poverty, IPCC, history, tele-connected pressures by globalization

Decision-making and scale:

Look into decision making processes – **HOW ARE DECISIONS MADE AND HOW IS INFORMATION TRANSFERRED (OR NOT)** this can influence policy in the Delta

this includes questions and issues such as:

WHAT IS THE SCALE OF GOVERNANCE/INSTITUTIONAL DIMENSIONS IF DELTAS OR THEIR CATCHMENTS ARE TRANSBOUNDARY IN NATURE?

UP-WATERSHED - DOWN-WATERSHED (TOP DOWN/BOTTOM UP) OWNERSHIP AND INFORMATION FLOW

TRUST AND CORRUPTION IN COMMUNICATING AND PROMOTING POLICIES AND DIFFERENT MECHANISMS FOR ENGAGING DIFFERENT PEOPLE.

Dealing with uncertainty questions:

HOW DO WE DEAL WITH AND COMMUNICATE AND DIFFERENTIATE ALIATORY (NOT KNOWABLE) AND EPISTEMIC (NOT KNOWN) UNCERTAINTY?

HOW DO ECOSYSTEM AND HUMAN HEALTH INTERACT IN DELTAIC SYSTEMS, AND HOW CAN THAT BE INFLUENCED FOR MUTUAL BENEFIT?

WHAT ARE MOTIVATIONS FOR SOCIAL DECISION ON PRIORITIES IN PUBLIC HEALTH (TAKING INTO CONSIDERATION THE TRIGGERING FUNCTION OF THE DELTA CANAL SYSTEM, FLOODING AND CHANGE)

Inorganic and organic toxins exacerbated by delta features and change and human use (e.g. arsenic in Bangladesh), Salinization / Intrusion – affecting groundwater aquifers