

SUSTAINABILITY SCIENCE

(in the Land use management context)

Understanding the obvious and not-so-obvious linkages between natural & social sciences

- Ensuring a balance between **ECOLOGICAL** (carrying capacity, resilience), **SOCIAL** (distribution of wealth, rights, social capital and coevolving preferences) & **ECONOMIC**
- Intensely '**Community Participatory Research**' – working with them on a 12-month calendar basis
- Understanding the 'strengths and weaknesses' in their diverse land use activities
- 'Reaching out' to all stake-holders whilst working with them on a 'year round' basis
- Understanding the location-specific and culture-specific diversities and trying to arrive at '**generalized principles**'
- **Giving back to the stakeholders at large – through policy documents, outreach vols., audio-visuals**

BIODIVERSITY LINKED KNOWLEDGE SYSTEMS: THE KEY TO ADDRESS LAND USE SUSTAINABILITY

CONSERVING: CULTURAL DIVERSITY AND LINKED BIODIVERSITY

leading to

CONSERVING/RESTORING VALUE SYSTEM BASED NATURAL CULTURAL LANDSCAPE

- ***Traditional forest dwellers*** have always desired to conserve the cultural landscape to which they are still intensely attached
- Even most modern ***urban societies*** too are now seeking to recreate biodiversity, thus getting close to 'nature' through reconstructed 'urban cultural landscape'

NGO movements in urban centres like Delhi, Bombay
(Even in USA – '*The land that could be*' by Shutkin, W.A. 2000.
Frank Bros. New Delhi: an urban movement in USA)

What is Biodiversity?

Sub-specific



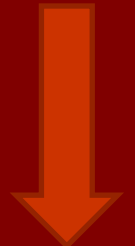
Species



Functional groups



Ecosystems



Landscapes

**THE CONCEPT OF SOCIAL VALUE
(‘SACRED’) LINKED WITH
BIODIVERSITY**

‘Sacred’ landscape (Specified)



‘Sacred’ landscape (Diffused)



‘Sacred’ Groves



‘Sacred’ Species

KNOWLEDGE SYSTEMS AND BIODIVERSITY

**Formal Knowledge - Hypothetico Deductive Process:
De-linked from Human Element**

**Traditional Knowledge - Societal Perceptive
Experiential Process: Strong
Human Element**

**LINKING THE TWO TOGETHER FOR
'HYBRID TECHNOLOGIES'**

Sustainable Livelihood/Development



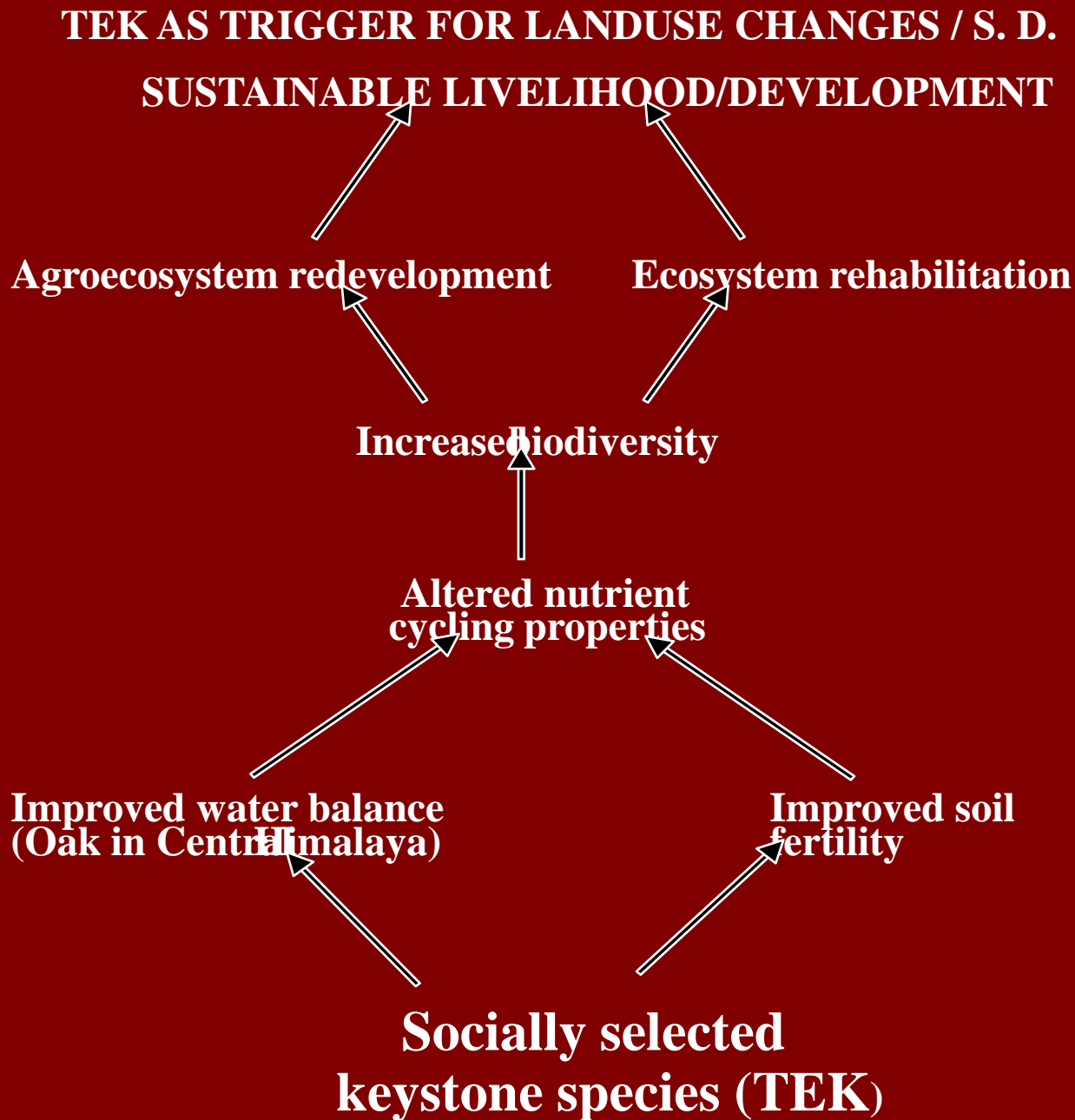
Ecosystem/Landscape Dynamics



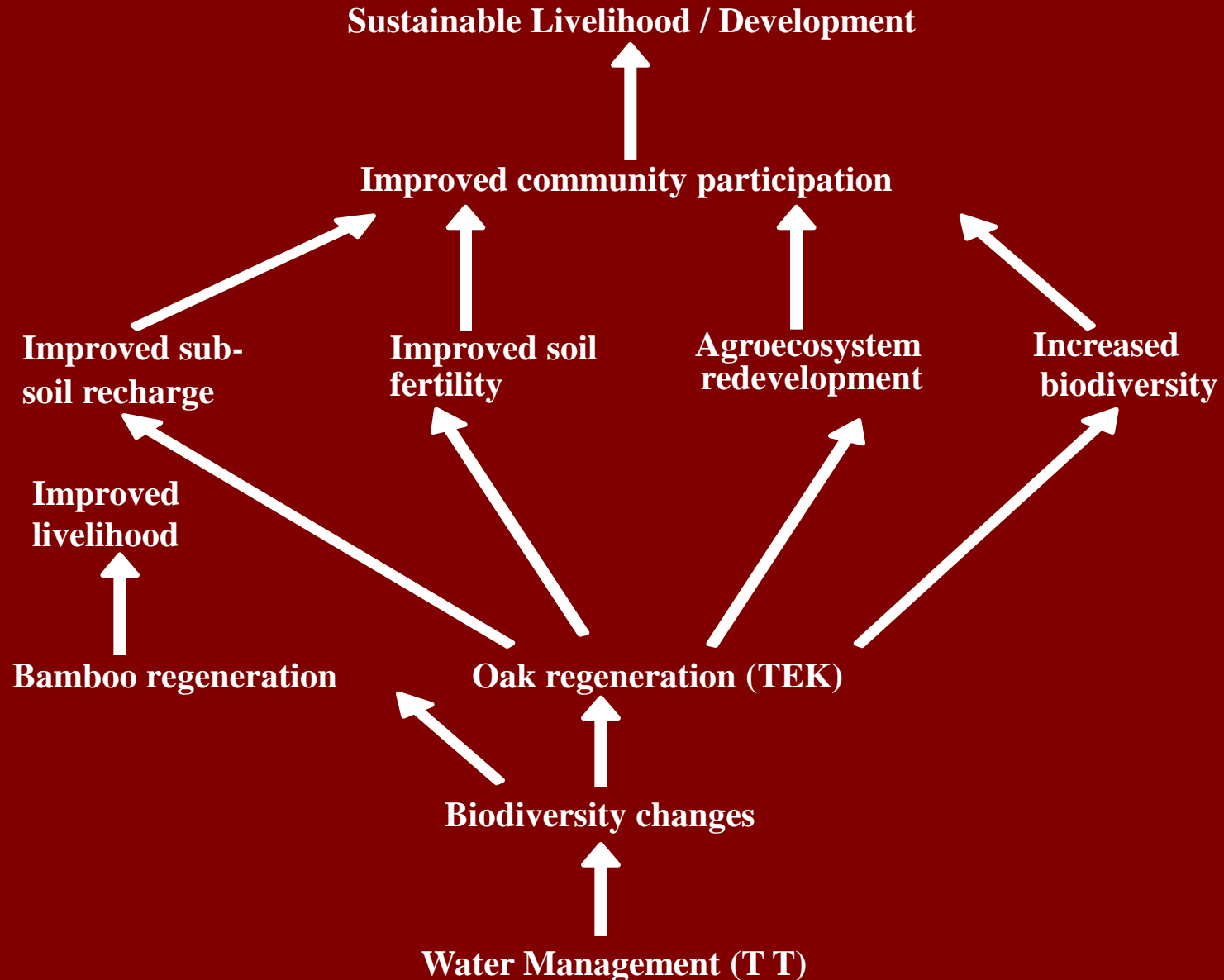
**Ecological
Processes**



**Social
Processes**



WATER LINKED TO TEK ACTING AS DIVERS FOR LAND USE/SOCIETAL DEVELOPMENT



**SUSTAINABLE LANDSCAPE
MANAGEMENT**
AGRICULTURAL
and linked
NATURAL ECOSYSTEM SUSTAINABILITY

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graph TD; A["SUSTAINABLE LANDSCAPE MANAGEMENT<br/>AGRICULTURAL<br/>and linked<br/>NATURAL ECOSYSTEM SUSTAINABILITY"] --> B["INCREMENTAL PATHWAY<br/>(BUILDING UPON TEK STEP<br/>BY STEP, WITH SOME FK AS<br/>APPROPRIATE )<br/>eg. shifting agriculture<br/>centred landscape<br/>of North East India"]; A --> C["CONTOUR PATH-WAY<br/>(BRING IN APPROPRIATE<br/>BALANCED DOSAGE OF<br/>TEK & FK )<br/>eg. sedentary<br/>agricultural systems<br/>under stress"]; A --> D["AUTO-ROUTE<br/>BUFFERING MODERN<br/>TECHNOLOGIES WITH<br/>REQUIRED DOSE OF<br/>TEK INPUTS<br/>eg. High input<br/>agroecosystems"];
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INCREMENTAL PATHWAY

(BUILDING UPON *TEK* STEP
BY STEP, WITH SOME *FK* AS
APPROPRIATE)

eg. *shifting agriculture
centred landscape
of North East India*

CONTOUR PATH-WAY

(BRING IN APPROPRIATE
BALANCED DOSAGE OF
TEK & *FK*)

eg. *sedentary
agricultural systems
under stress*

AUTO-ROUTE

BUFFERING MODERN
TECHNOLOGIES WITH
REQUIRED DOSE OF
TEK INPUTS

eg. *High input
agroecosystems*

Traditional Sustainable Natural Cultural Landscape Construct (Of the Apatanis of Arunachal Pradesh)



Adaptive management towards community participatory approaches

Participatory problem-solving and empowerment of all
stakeholders

**The basis for sustainable management of natural resources linked
livelihood issues of traditional societies in the forested landscape**

**Urbanized world: Moving towards reconstructing the lost and/or rapidly losing
cultural landscape – the concept of ‘urban cultural landscapes’**

**TOWARDS COPING UP WITH INCREASING ECOLOGICAL
UNCERTAINTIES TOWARDS CONSERVATION LINED SUSTAINABLE
LIVELIHOOD/DEVELOPMENT**

AND

GLOBAL HUMAN SECURITY

Sustainability Science: An integrative metaparadigm

Complex linkages:

- between **Ecological Sustainability** (carrying capacity and **resilience**), **social sustainability** (distribution of wealth and rights, social capital, and coevolving preferences) & **Economic Sustainability**

Shared assumptions and theory:

- ***metaparadigm*** - Rather than espousing and defending a single discipline or paradigm, seeking to seek compromises with: pluralistic range of viewpoints and models to have a richer understanding of the inherently complex systems

All inclusive:

- Aimed at **more integrated, ways to think about the linkages between Ecological and Economic systems**

ADAPTIVE METHODOLOGIES
OF NATURAL RESOURCES



ADAPTIVE MANAGEMET
LIVELIHOOD/DEVELOPMENT