

Caribbean Large Marine Ecosystem Project TDA/SAP Training Course



MODULE 4: JOINT FACT-FINDING 2

Causal Chain analysis
Governance analysis
Integration and Submission of the TDA

STRUCTURE OF THE MODULE

PART 1: GENERAL PRINCIPLES

What is a causal chain analysis

Immediate causes

Underlying causes

Root causes

PART 2: CAUSAL CHAIN ANALYSIS

- Sectoral analysis of causal chains
- Other approaches
- Potential difficulties
- Governance analysis

PART 3: PRODUCTION & SUBMISSION OF TDA

- Integration of the component parts
- Drafting the TDA
- Review & Submission
- Relationship between the TDA & the SAP

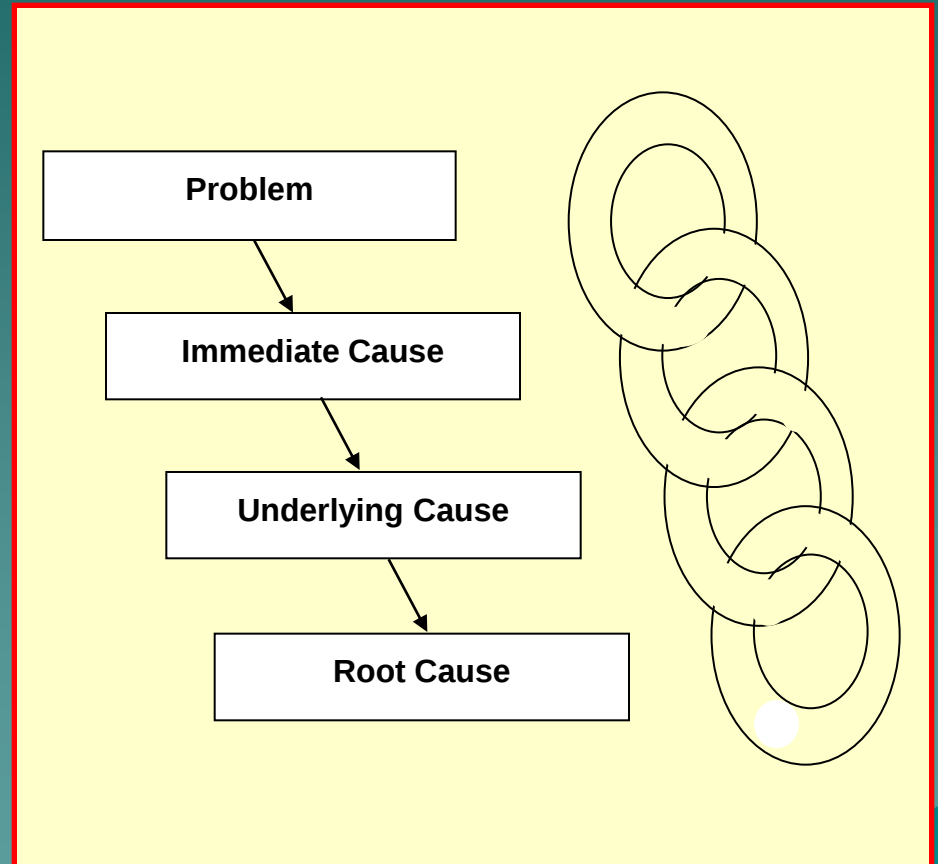
PART 1

GENERAL PRINCIPLES



WHAT IS CAUSAL CHAIN ANALYSIS?

- ◆ A causal chain is a series of statements linking the causes of a problem with its effects
- ◆ Each link in the chain is forged by answering the question “*why? - what is the cause?*”



3 DIMENSIONS OF A CAUSAL CHAIN ANALYSIS

DIMENSION # 1

A series of statements linking the causes of a problem with its effects

DIMENSION #2

Interlinking between several causes and the same effect;
Or,
the same cause producing several different effects

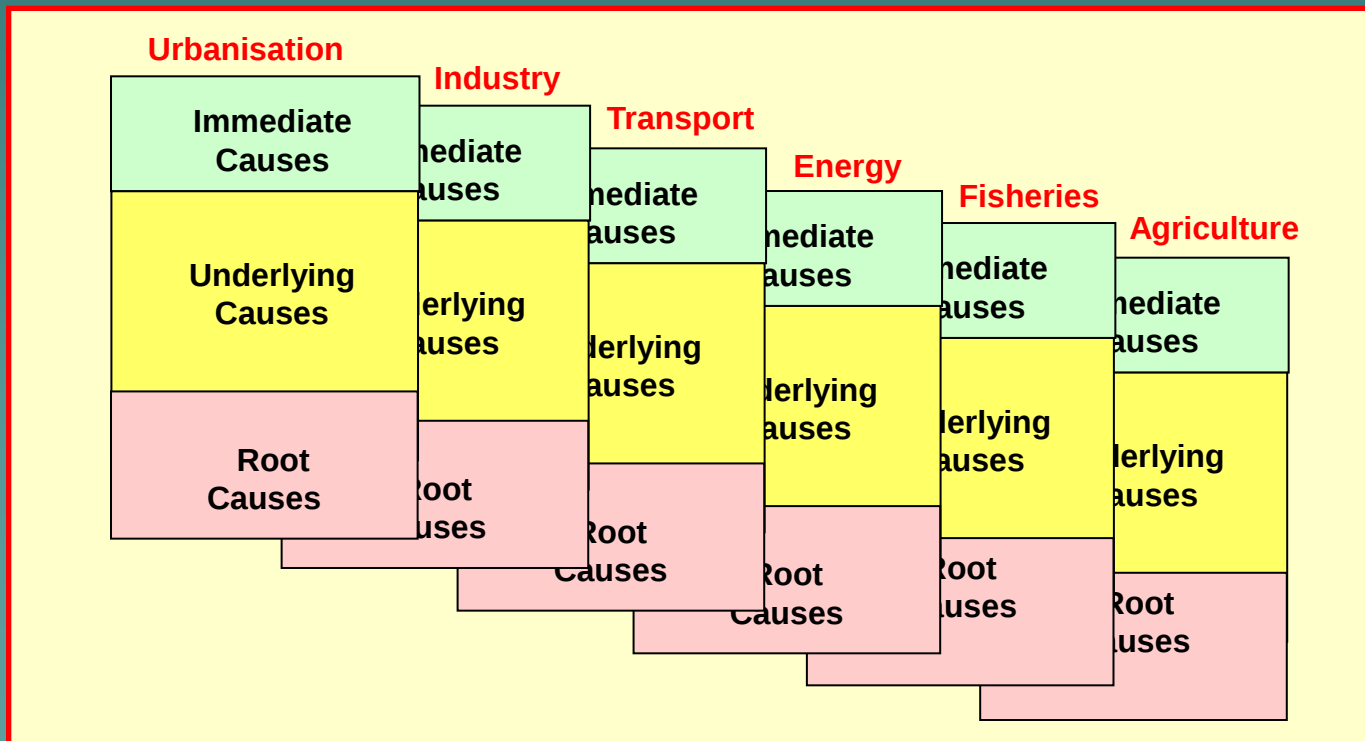
DIMENSION # 3

Sectoral: each sector has its own set of causes and effects, but these interact with other sectors

THE SECTORAL DIMENSION IN THEORY

IN PRINCIPLE.....

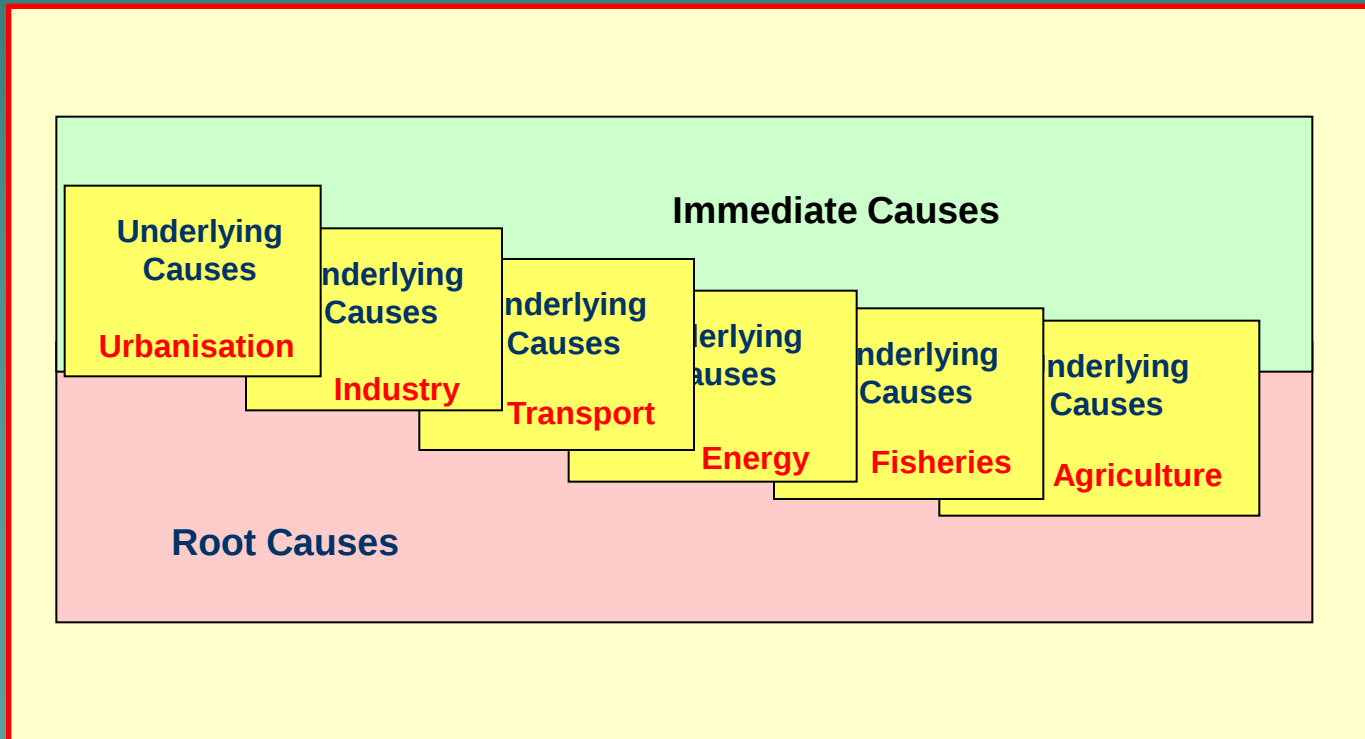
in each of the sectors involved there will be a sectoral causal chain, which may be connected at some points to the chain of another sector



THE SECTORAL DIMENSION IN REAL LIFE

HOWEVER.....

Immediate causes, and root causes, tend to span several sectors. It is often only at the **underlying causes level** that there is a clear sectoral distinction



THE GENERIC SECTORS

- ◆ Agriculture
 - ◆ Fisheries and aquaculture
 - ◆ Urbanisation
 - ◆ Industry/mining
 - ◆ Energy Production
 - ◆ Transport/infrastructure
 - ◆ Tourism, leisure and recreation
 - ◆ Defence
 - ◆ Health
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WHY SECTORAL ANALYSIS?

◆ BECAUSE.....

- that is the way modern society is organised and governed

◆ HOWEVER.....

- sectors interact
 - sectors may share root causes
 - one sector may cause effects in other sectors
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A 'HOLISTIC' APPROACH

‘Environmental problems should be dealt with at their roots, *irrespective* of sectoral or geographical boundaries’

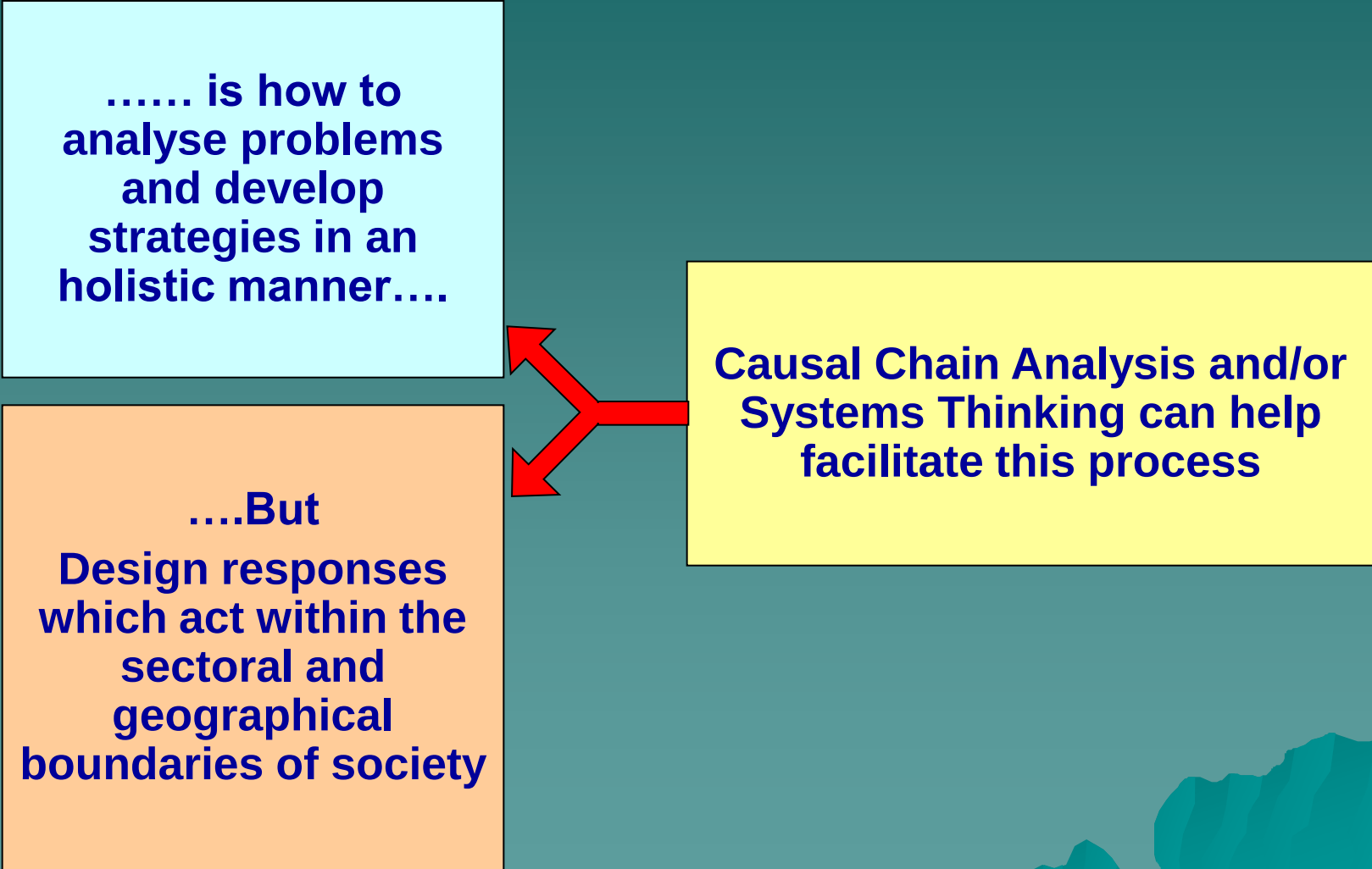
1992 UN Conference on
Environment and Development

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THE CHALLENGE.....

..... is how to
analyse problems
and develop
strategies in an
holistic manner....

....But
Design responses
which act within the
sectoral and
geographical
boundaries of society



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graph LR; A[..... is how to analyse problems and develop strategies in an holistic manner....] --> C[Causal Chain Analysis and/or Systems Thinking can help facilitate this process]; B[....But Design responses which act within the sectoral and geographical boundaries of society] --> C;
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Causal Chain Analysis and/or
Systems Thinking can help
facilitate this process

IMMEDIATE CAUSES

- ◆ USUALLY, IMMEDIATE CAUSES ARE:
 - ◆ The direct technical causes of the problem.
 - ◆ They are predominantly tangible
 - ◆ Have distinct areas of impact (with the exception of causes such as atmospheric deposition)

Problem	Immediate cause
Modification of stream flow	Changed diversions: Domestic and industrial water supply Agricultural uses Trans-basin transfers
	Changes in storage: Reservoirs Lakes
	Changes in land use: Deforestation Changes in agricultural practice Artificial banking of rivers
Chemical pollution	Pollution from diffuse sources Runoff Emissions from storage of chemical products Solid waste, liquid wastes Emissions from transport Accidental releases (e.g. shipping, industry)
	Pollution from point sources Operational discharge of liquids and gaseous effluents Emissions from storage of chemical products Solid waste, liquid wastes Emissions from transport
Loss or modification of ecosystems	Loss or modification of aquatic habitats
	Changes in land use (Urbanisation, agro-forestry, etc.)
	Introduced species
	Changes in the sediment transport regime

EXAMPLES OF IMMEDIATE CAUSES

UNDERLYING CAUSES

- ◆ Underlying causes are those that contribute to the immediate causes
- ◆ They can broadly be defined as:

**Underlying resource uses and practices,
and their related social and economic causes**

UNDERLYING CAUSES

RESOURCES USES AND PRACTICES can include:

- land use
- waste discharges
- damaging or unsustainable practices
- uses of water (diversion, storage etc)

SOCIAL AND ECONOMIC CAUSES can include:

- increased sectoral development
- investment, operation and maintenance
- waste minimisation procedures
- demand and supply side management, etc

EXAMPLE OF UNDERLYING RESOURCES & PRACTICES IN AGRICULTURE.....

.....that contribute to eutrophication could include:

- Inefficient agricultural practices
- Inadequate waste management
- Lack of storage facilities for liquid and solid wastes
- Lack of cultivation margins
- Over application/ incorrect use of fertilisers in agriculture
- Over ploughing
- Concentration of agro-industrial facilities and Intensive livestock production

EXAMPLES OF SOCIAL, ECONOMIC, LEGAL AND POLITICAL CAUSES.....

.....that contribute to eutrophication (from agriculture and a number of other sectors) could include:

- Lack of human/ technical capacity
- Limited capital Investment
- Lack of land tenure
- Lack of incentives (subsidies)
- Inadequate economic sanctions (taxes)
- Deficiencies in implementation of regulations, monitoring and enforcement
- Ineffective national/regional policies/management plans
- Deficiencies in institutional capacity
- Deficiencies in legislation

EXAMPLE OF UNDERLYING RESOURCES & PRACTICES IN FISHERIES.....

.....that contribute to loss of fish stocks could include:

- Destructive fishing practices
- Bycatch and discard
- Aging fishing fleets
- Increasing fishing fleets
- Illegal fishing practices
- Lack of a effective monitoring systems of fishing activities

EXAMPLES OF SOCIAL, ECONOMIC, LEGAL AND POLITICAL CAUSES.....

.....that contribute to loss of fish stocks could include:

- Lack of or ineffective fisheries international agreements/ regulations
- Deficiencies in legislation
- Deficiencies in enforcement of national fisheries management and control plans
- No effective control of fishing practices
- Economic situation
- Lack of human/ technical capacity
- Limited capital Investment
- Deficiencies in institutional capacity

ROOT CAUSES

- ◆ Root causes are often related to fundamental aspects of macro-economy, demography, consumption patterns, environmental values, and access to information and democratic processes
 - ◆ In terms of importance to the degradation of aquatic environment, root causes are often the most difficult to assess
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ROOT CAUSES

- ◆ ROOT CAUSES CAN BE DIVIDED INTO THE FOLLOWING CATEGORIES:
 - ◆ Governance
 - ◆ Population pressure and demographic change
 - ◆ Poverty, wealth and inequality
 - ◆ Development models and national macro-economic policies
 - ◆ Social change and development biases
 - ◆ Education and formulation of values

GEF INTERVENTION?

- ◆ Most of these are beyond the scope of GEF intervention, but it is useful to document them for two reasons:

1.

Some proposed solutions may be unworkable if the root causes of the problem are overwhelming

2.

Actions taken nearer to the root causes are more likely to have a lasting impact on the problem

EXAMPLE OF A ROOT CAUSE

IN THE CASE OF EUTROPHICATION, A ROOT CAUSE MIGHT BE A CULTURAL CHANGE IN DIET – SUCH AS AN INCREASE IN MEAT CONSUMPTION – THAT LEADS TO A MARKET DEMAND FOR CHEAP MEAT, AND THE INTENSIFICATION OF ANIMAL FARMING RESULTING IN HIGHER NITROGEN AND PHOSPHORUS EMISSIONS.

PART 2

CAUSAL CHAIN ANALYSIS

POINTS OF ADVICE

- ◆ Do not underestimate the time needed to carry out this process
 - ◆ Ensure that the TTT members working on this process cover all the areas of expertise needed
 - ◆ Work in a stepwise manner. Start with the immediate causes and work towards the underlying causes
 - ◆ Different aspects can be carried out in parallel
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POINTS OF ADVICE (Cont.)

- ◆ Prior to the workshop (s), have your methodology well developed and understood by key members of the TTT
- ◆ Do not be over ambitious andremember:

A simple chain that clearly reflects the situation in a region will be more useful than a complicated chain that is difficult to understand

Identify the **immediate causes** of each issue

Identify the **sectors** that contribute to the issue

Link the sectors to the appropriate immediate causes

For each sector, identify all the **underlying resource uses and practices** that contribute to each immediate cause

For each sector, identify the **underlying social, economic, legal and political causes** of each immediate cause.

Determine the **root causes**

Link the resource uses and practices, and social, economic, legal and political causes

This should be done in parallel to the identification of the immediate causes

It is important to identify where the root causes are having most effect

Many causes will have been identified during the stakeholder analysis

Can be done in one of two ways:
Sectorally or inter-sectorally
contribute to the immediate cause

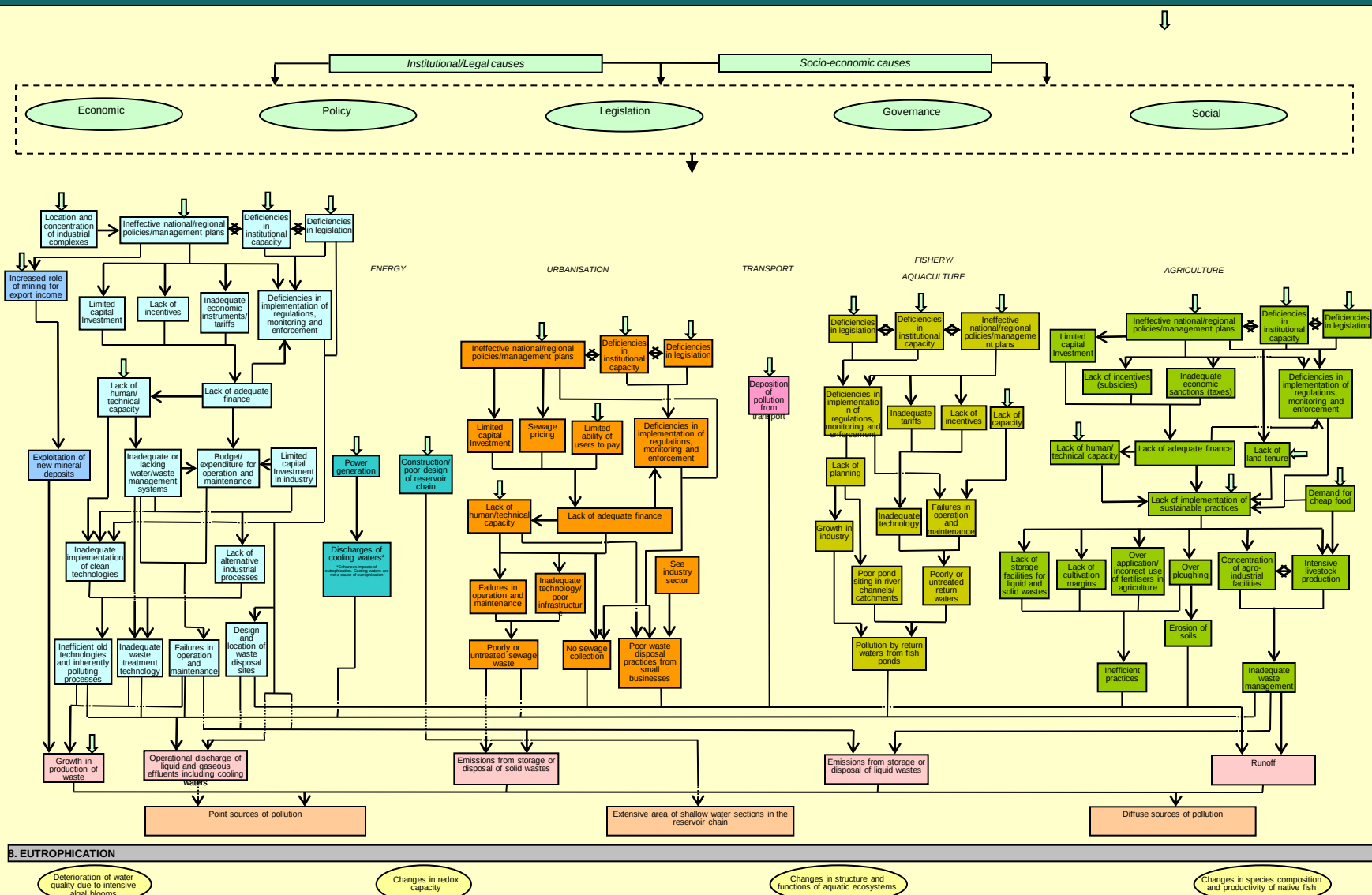


A CAUSAL CHAIN !

EXAMPLES OF CAUSAL CHAINS



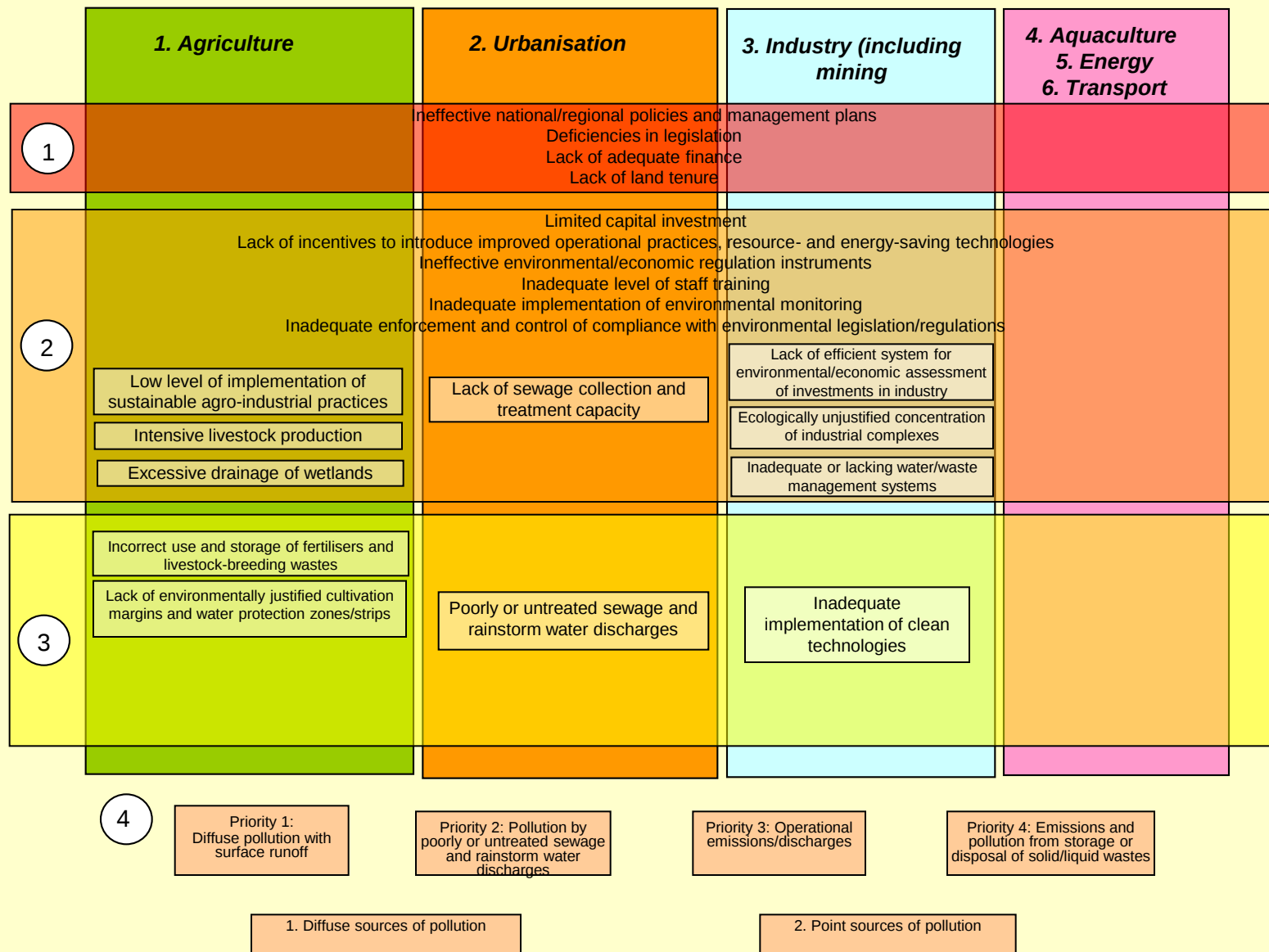
Dnipro Basin Causal Chain for the issue of eutrophication



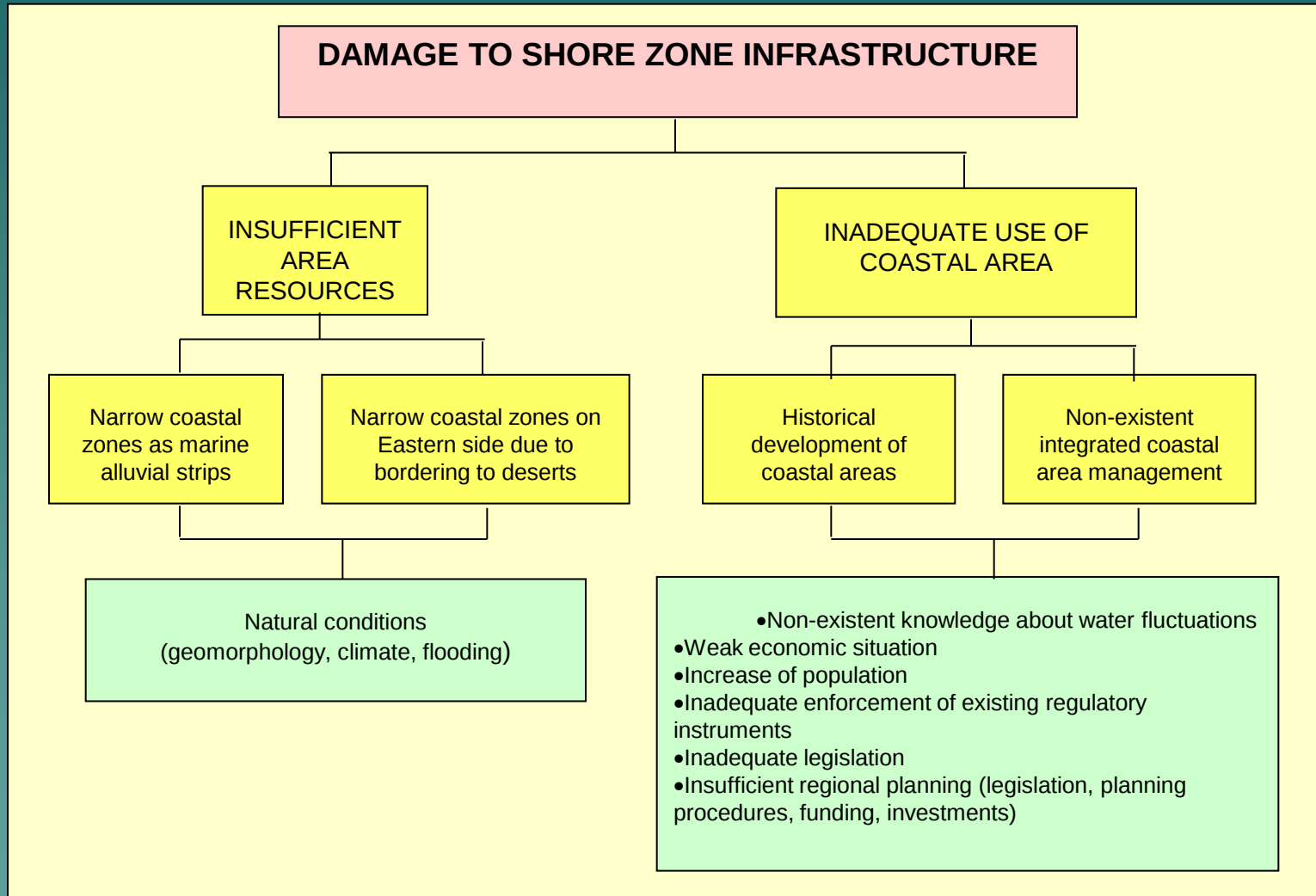
Dnipro Basin Causal Chains

- ◆ Highly detailed and complex
- ◆ Required a great deal of time and expertise
- ◆ Most of the information is included in the diagram
- ◆ **BUT** difficult to analyse and difficult for a decision maker to translate into action
- ◆ Consequently, the TTT had to develop a “SAP decision making management tool”

Dnipro Basin SAP decision making management tool for the issue of eutrophication



CASPIAN SEA CAUSAL CHAIN



Caspian Sea Causal Chains

- ◆ Very little detail
- ◆ Lack of understanding of CCA methodology
- ◆ Not logical
- ◆ **Therefore** difficult for a decision maker to translate into action

BLACK SEA

CAUSAL CHAIN ANALYSIS FOR CHEMICAL POLLUTION

Root causes

Historical legacy of polluting activities

•Low standard of living (poverty, unemployment, low incomes)

•Political/**Economic** changes and/or instability

•Increased population in coastal areas

•Low standard of environmental education and awareness

•Poor implementation of sectoral management planning

Underlying causes

Socio-economic drivers

-lack/ poor enforcement of environmental protection regulations in agriculture
-Diminished government control of privatized farms
-Lack/poor planning of agricultural use
-Low awareness of negative environmental effects

-lack/ poor enforcement of environmental protection regulations in industry (including energy and extraction of raw materials)
-poor or no enforcement of trade waste discharge regulations
-Weak sectoral industrial policy and related legislations
-No incentive for pollution prevention and control
-**Lack of finances**

Lack/poor enforcement of environmental protection regulations in shipping and harbor activities
No incentives for pollution prevention and control

-Uncontrolled development in coastal areas
-Low level of user fees (tariffs) and incentives for wastes collection, storage
-Poor management/planning/use of landfills
-Poor capital investment and operational funding for waste collection/storage and treatment

Lack/ mismanagement of public funds dedicated to improve the quality of the environment

Resource uses

-Unsustainable/inefficient agricultural practices
-Historical legacy from over application of pesticides

-Untreated industrial effluents and/or poorly maintained industrial treatment plants
-Absence of / or outdated treatment technology
-anachronistic industrial technologies and practices (including energy and extraction of raw materials)

Absence of or outdated storage and treatment technology and facilities
Aging fleet
Poor maintenance of vessels
No effective monitoring and intervention plan for pollution from ships
Illegal shipping/ harbor operations

-Poor management/planning/use of landfills
-Lack of treatment, and/or no infrastructure for collecting leachate
-Lack of operation and maintenance control in collection of solid waste

Direct Causes

Elevated pollutant loads resulting in high levels of pollutants accumulation in sediments

-Point and diffuse sources of effluent from livestock farms
-Diffuse pollution from pesticides
-ground/soil water discharges (containing elevated levels pesticides) to surface waters

-Discharge of untreated industrial effluents
-Atmospheric emissions of pollutants deposited on land/ directly into the sea
-Oil spills

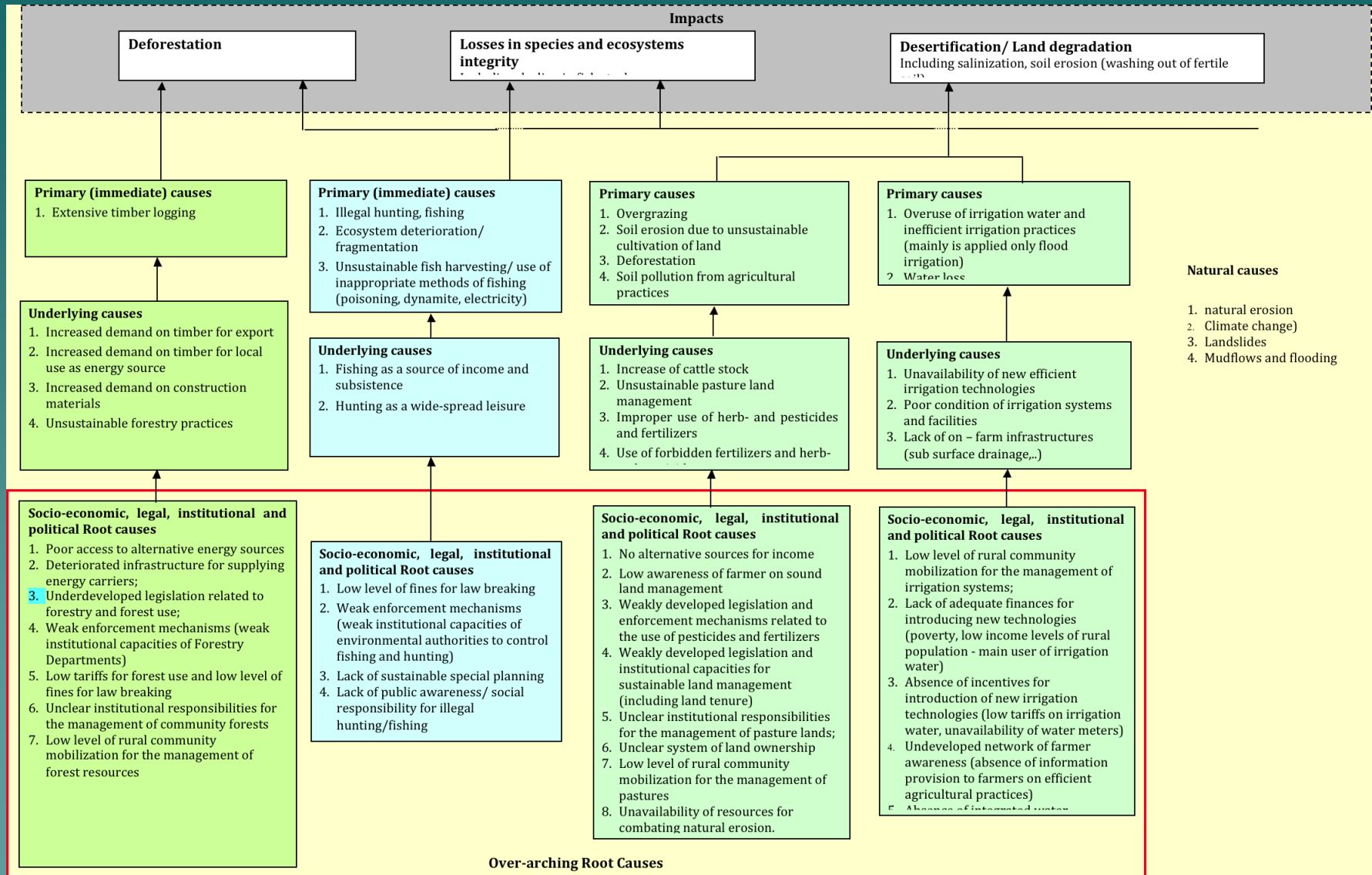
Oil spills
Dumping/ discharges of wastes
Discharges of untreated ballast waters
Accidents

-Infiltrations from landfills
- Municipal waste disposal (including litter) accidentally reaching the sea
-additional litter loads from tourism
-Inappropriate solid waste disposal

Black Sea Causal Chains

- ◆ More detail than the Caspian Sea example
 - ◆ Some linkage and logical process
 - ◆ Could still have more detail
 - ◆ Easier for a decision maker to translate into action
 - ◆ **BUT** is it the right action? Does it have enough detail?
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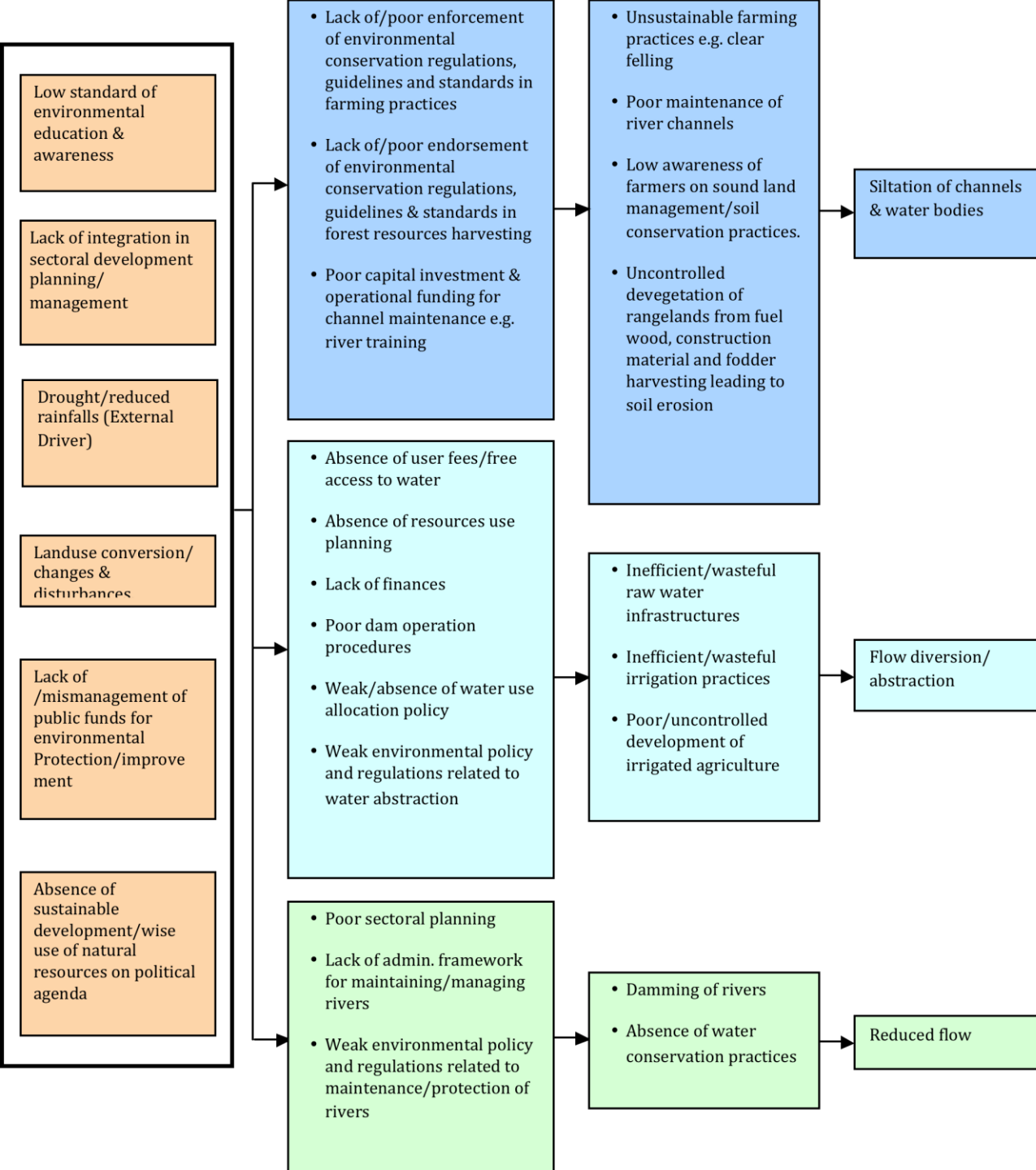
Kura-Aras River Basin – CCA for Ecosystem Degradation



Kura-Aras River Basin Causal Chains

- ◆ Good level of detail
 - ◆ Some linkage and logical
 - ◆ Links causes to impacts – a good idea
 - ◆ Again easy for a decision maker to translate into action
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LAKE CHAD



Potential difficulties in developing causal chains

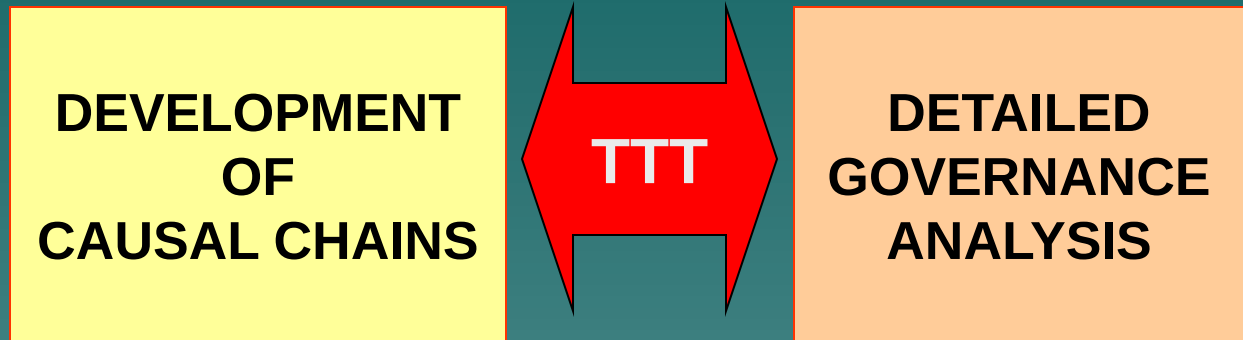
CAUSAL CHAIN TYPE	ADVANTAGES AND DISADVANTAGES
Table or matrix (e.g. Benguela current)	✓ Simpler to produce ✓ Conceptually easy for the expert to produce ✗ Provide less information ✗ Difficult to show linkages between causes ✗ Conceptually difficult for the reader to understand ✗ More difficult to identify SAP interventions
Flow diagram (e.g. Dnipro Basin)	✓ Generally more informative ✓ Show linkages between causes ✓ Work well using the sectoral approach ✓ Conceptually easy for the reader to understand ✗ Difficult to construct ✗ Conceptually difficult for the expert to produce ✗ Time consuming

PART 3

GOVERNANCE ANALYSIS



Governance Analysis in the TDA



In order to understand the dynamics and synergies between the causes of transboundary problems and possible failures in governance, it is vital that there is regular feedback between those carrying out the causal chain analysis and those undertaking the governance analysis.

Why Governance Analysis?

◆ BECAUSE.....

- ◆ Governance frameworks provide the context within which human actions (whether as drivers or as responses) take place
- ◆ Without a basic understanding of the institutional relationships and responsibilities at all levels, and existing policy/legal frameworks, decisive issues may be overlooked or wrongly perceived, and impractical recommendations may emerge

What should governance analysis consist of?

- ◆ Governance analysis should describe the dynamic relations within political and social structures that underpin such aspects as legislative and regulatory frameworks, decision-making processes and budgetary allocations.

CROSS-CUTTING CAUSES IDENTIFIED AS GOVERNANCE ISSUES

- ◆ Example: Underlying causes of eutrophication:
 - ◆ Ineffective national/regional policies/management plans
 - ◆ Deficiencies in institutional capacity
 - ◆ Deficiencies in legislation
 - ◆ Deficiencies in enforcement

Governance analysis

- ◆ Governance analysis will be discussed in more detail in Module 6 (Governance analysis and Stakeholder involvement)

PART 4

PRODUCTION & SUBMISSION OF COMPLETE DRAFT TDA

PROCEDURE

◆ WHO IS RESPONSIBLE?

- ◆ The Project Manager

◆ THREE OPTIONS TO CARRY OUT THE INTEGRATION (THERE ARE OTHERS):

- ◆ Appointment of a consultant/specialist/academic to act as a single author reporting to the Project Manager
- ◆ Appointment of TTT experts to draft individual Chapters of the TDA , with an appointed TTT Manager as a focal point reporting to the Project Manager
- ◆ TTT experts all contribute to the drafting process, and report individually to the Project Manager

DRAFTING THE TDA

EXECUTIVE SUMMARY	A good executive summary will sell your TDA.
THE MAIN TEXT	Don't present too much text. Don't overburden the document with pages of figures and tables.
LANGUAGE	If the TDA is not written in English, a translation will be needed
MAPS	It is important to include simple maps (either sketch, GIS or photographic), for illustration.
TECHNICAL REPORTS	Complex technical reports should be published separately or as annexes.
CONTENTS LIST	Provide a Contents List and a Glossary of all terms employed.
ACKNOWLEDGEMENTS	Include a full list of contributing specialists, and annexes with lists of identified stakeholders.

THE TDA REVIEW PROCESS & SUBMISSION

◆ Review Steps

- ◆ Main stakeholder meeting (may include review by a wider audience)
- ◆ Review meetings for the Interministry committees.

The TDA should be formally adopted by the Project Steering Committee. This adoption gives a seal of authority on the document as an input into the more political process of the SAP.

RELATIONSHIP BETWEEN THE TDA AND THE SAP

- ◆ A good TDA will make it easier to develop logical, sustainable and politically acceptable solutions
- ◆ The findings from the TDA, particularly those relating to the priority problems, sectors and causes will be used in the first stages of the SAP development
- ◆ The long-term Eco/WR QOs should flow from the priority problems, sectors and causes identified in the TDA
- ◆ SAP development should involve developing a matrix of options and identifying which part of the TDA causal chain they address