

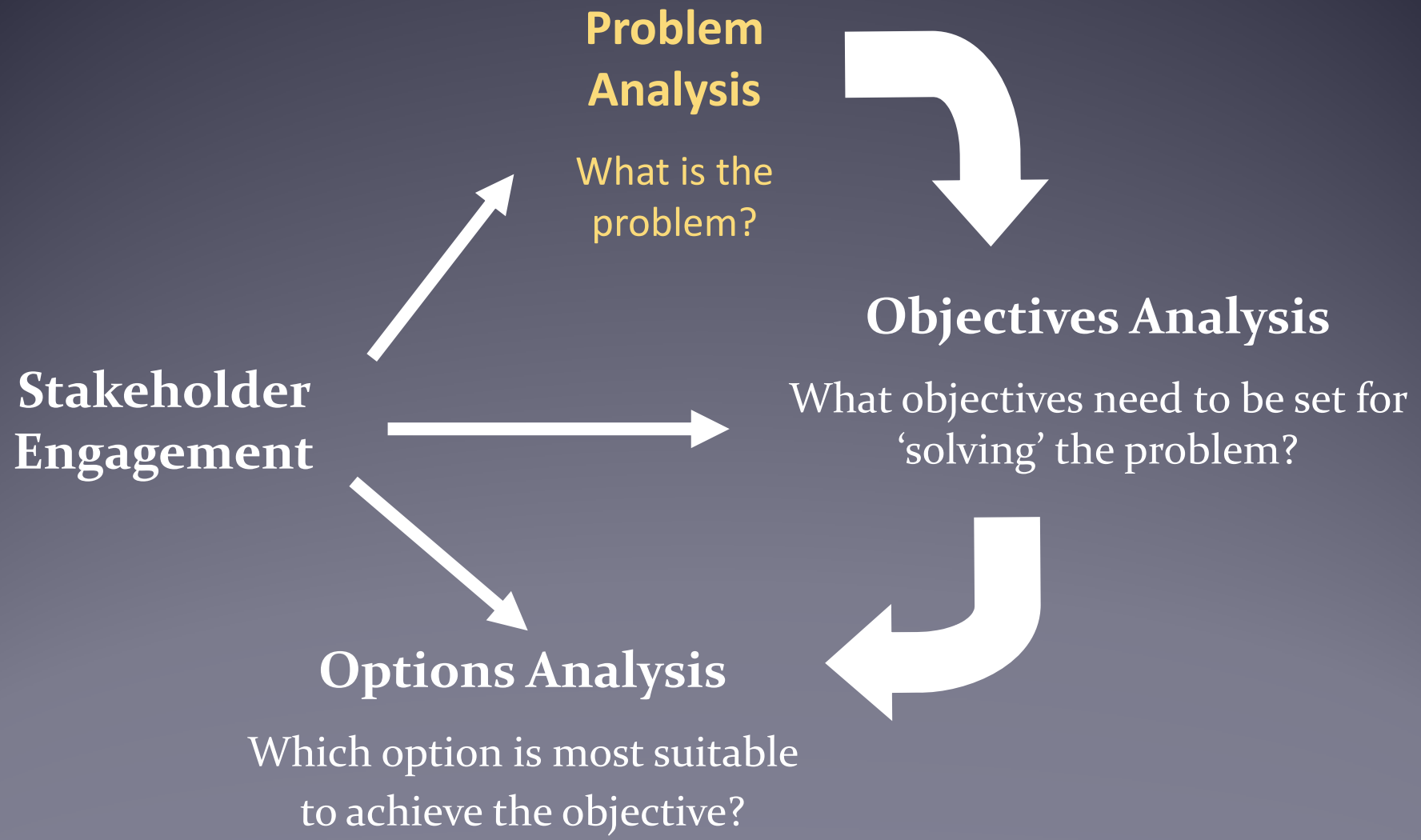


From problem analysis to the definition of objectives

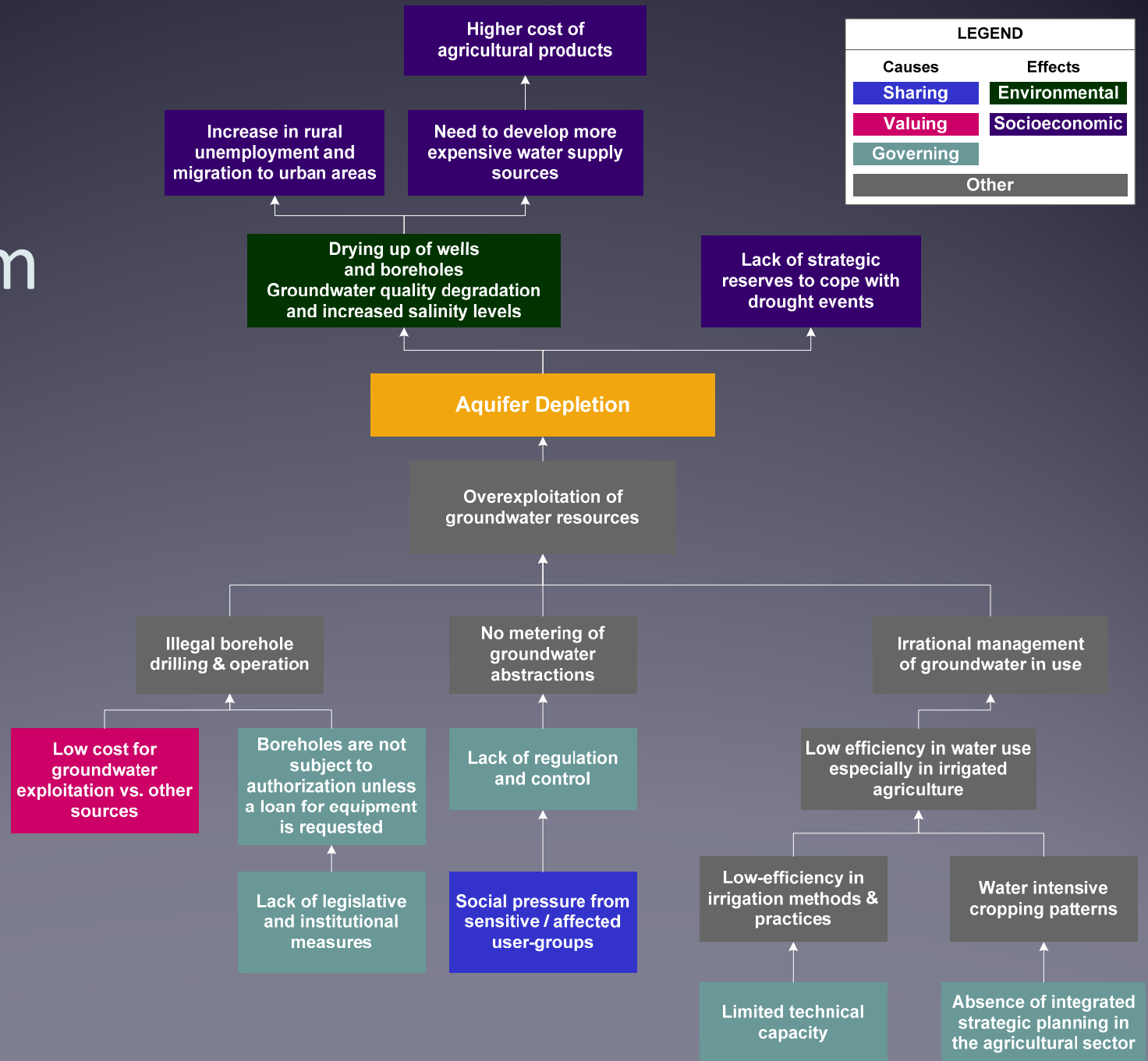
Aquifer Depletion in Tunisia

Prof. Dionysis Assimacopoulos
INECO Project Coordinator
NTUA, Greece

Problem – Objectives – Options Analysis

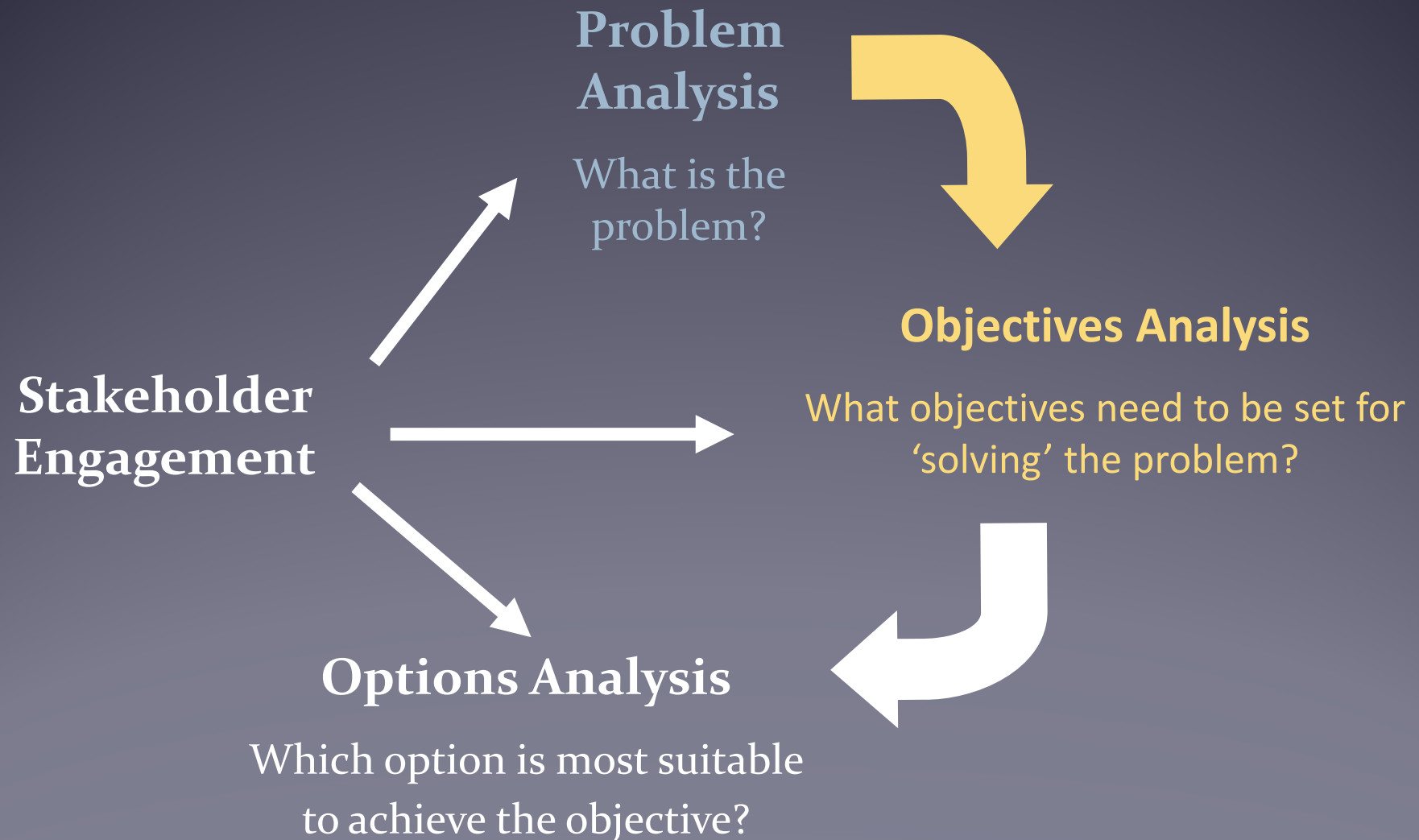


The problem tree



LEGEND	
Causes	Effects
Sharing	Environmental
Valuing	Socioeconomic
Governing	
Other	

Problem – Objectives – Options Analysis



From Problems to Objectives

- **Problem Analysis**

- Identify the main (focal) problems
- Establish cause & effect relationships
- Ensure that
 - “Root causes” are recognized and subsequently addressed
 - The analysis does not focus on the symptoms of the problem



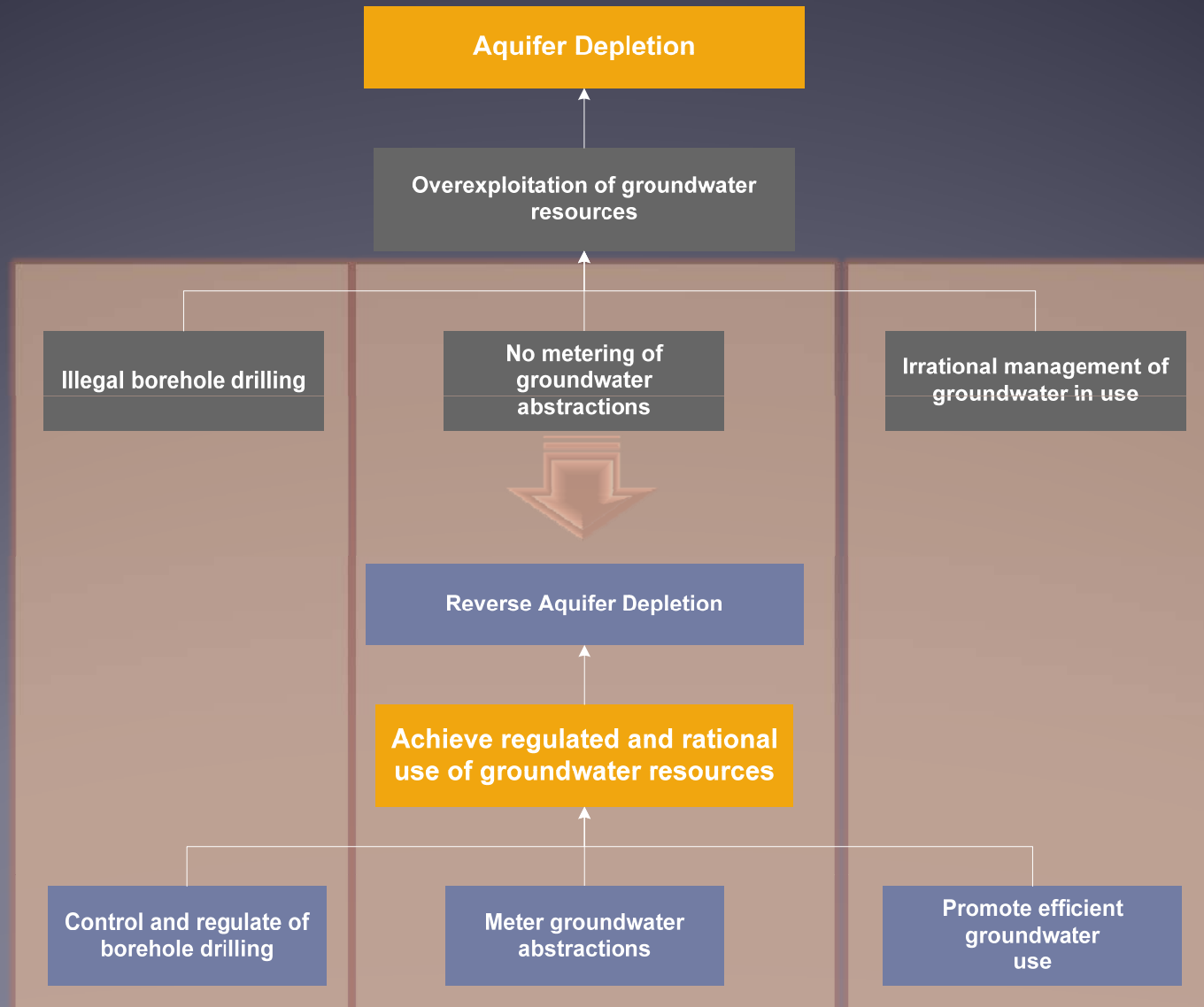
- **Objectives Analysis**

- Identify a set of objectives that could address the focal problem causes
- Collaborative effort (participation of all stakeholders) to ensure that:
 - Objectives are feasible
 - Targeted outputs are in line with current policies and contribute towards their implementation

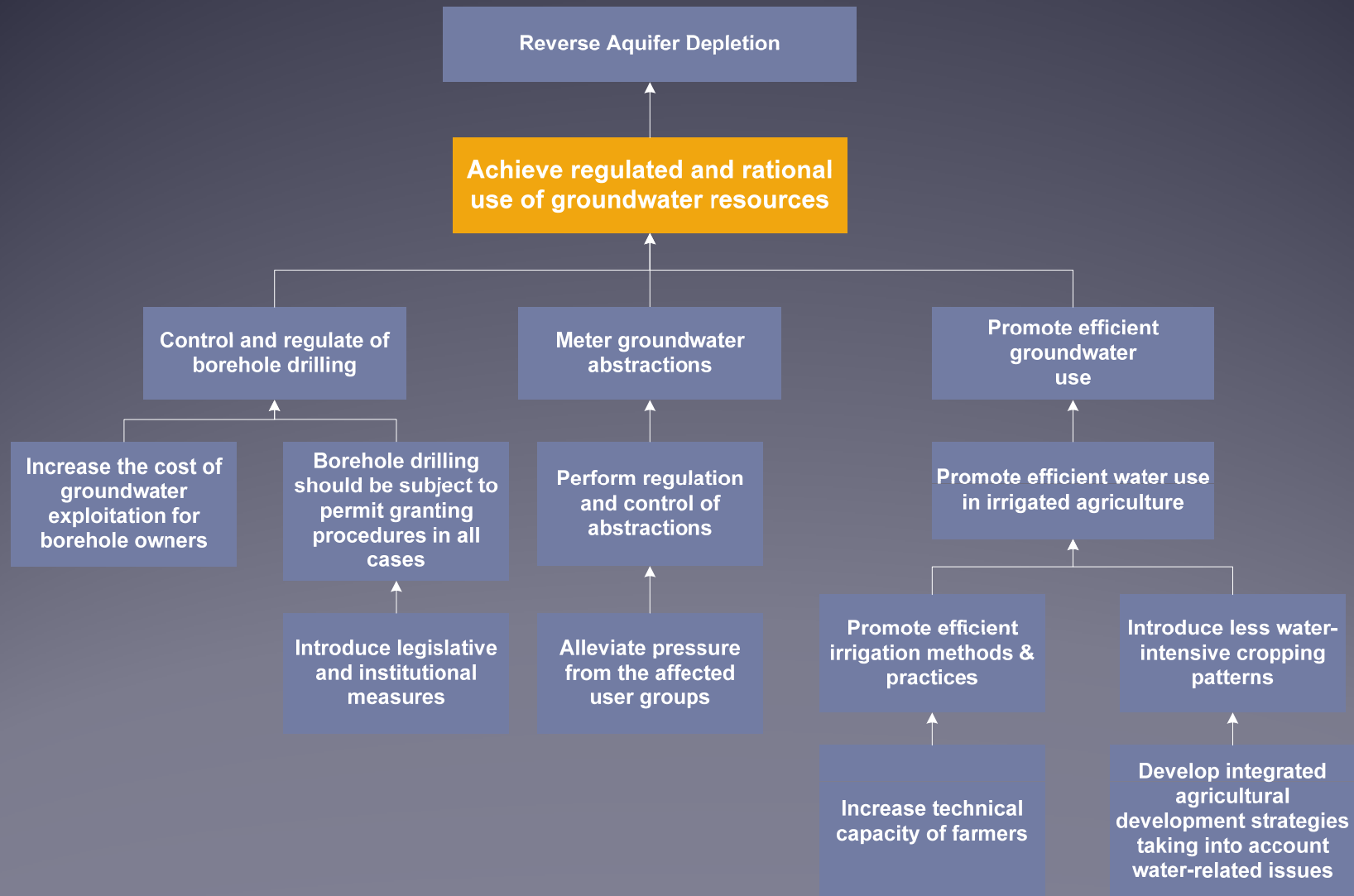
From the Problem tree to the Objective tree

- **Purpose:** Translate problems into objectives
- **Method:**
 - Reformulate focal problems into positive, desirable conditions (objectives)
 - Change relationships of “cause-effect” into “means-ends”
 - Delete (non feasible)/add objectives
 - Add missing links in “means-ends” relationships
 - Select the main objective(s)

Main problem vs. Main objectives



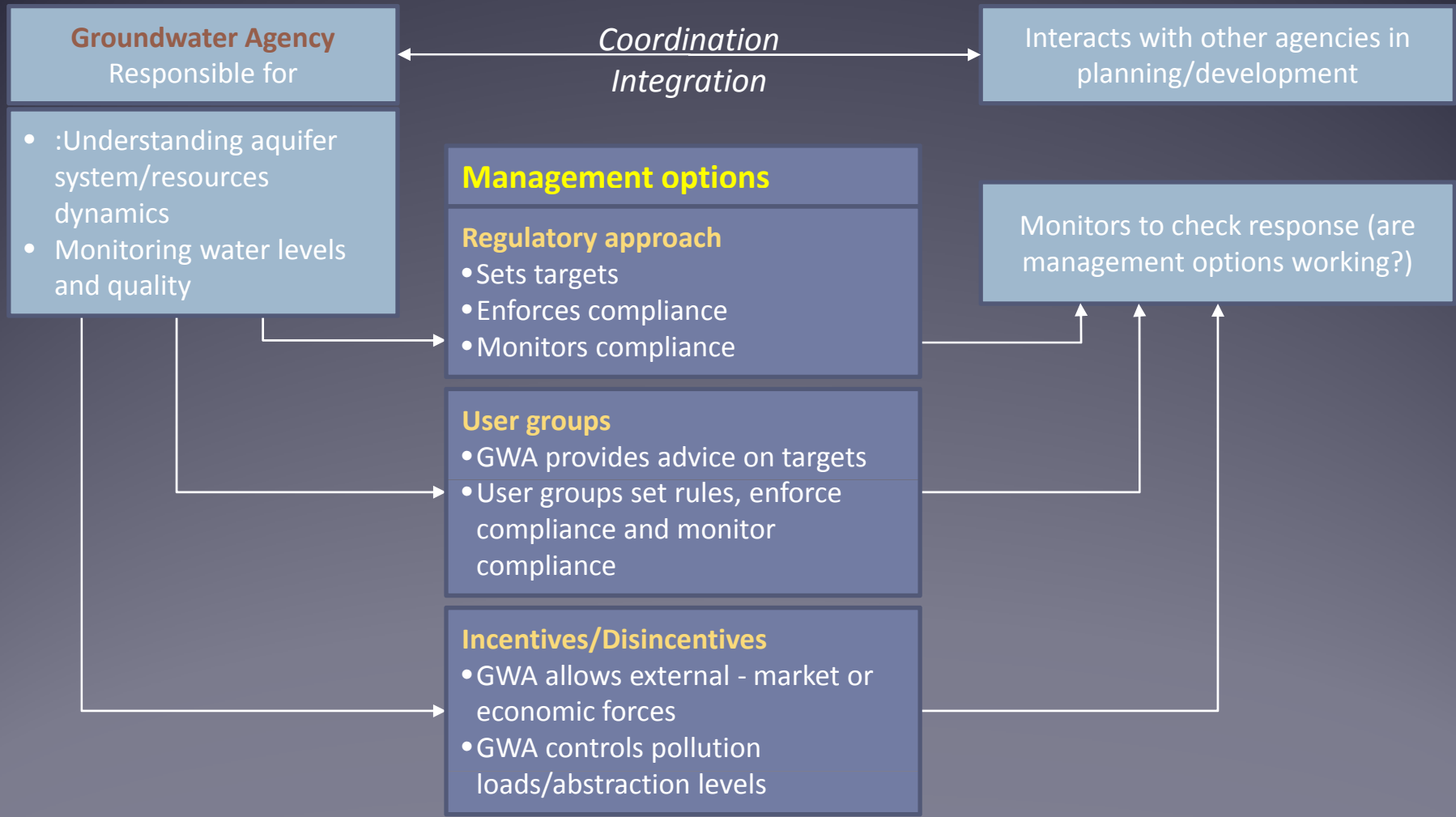
The overall objective tree





Management options and Instruments for Groundwater overexploitation

Addressing GW issues



Adapted from UNEP, 2003

The Regulatory approach

- Pre-requisites:
 - Legislation on the public ownership of groundwater
 - Strong public administration and political commitment
- Process: Granting of rights of use is regulated by state or governmental agencies
 - Monitoring & assessment of aquifer status
 - Preservation of aquifer-dependent ecosystems
- Problems:
 - Monitoring and enforcement can be difficult and costly
 - Coping with traditional access/exploitation rights
 - Increase awareness so that enforcement becomes accepted by the society
- Experiences:
 - Top-down level control has in many cases proven unfeasible

User groups - Incentives

- Establishment of collective management systems (bottom-up approach)
 - GW perceived as common property
 - Individual rights assigned on a customary base and enforced through mutual control
 - Associations ensure the definition of allocation rights and the settlement of disputes
- Incentives/dicincentives and mixed economic/regulatory instruments
 - Abstraction charges (environmental taxation)
 - Voluntary agreements, etc.

Changing practices in Agricultural sector

- Incentives to adopt innovative technologies/practices
 - Economic incentives: soft loans, grants, subsidies
- Disincentives in continuing existing practices
 - Penalties, fines, sanctions in case of environmental violation
 - Environmental taxation, internalizing environmental and resource costs (abstraction charges, pollution charges)
- Raising awareness and enhancing technical capacity
 - Educational programmes, training seminars, continuous consultation from local agencies
 - Establishment of user-groups (end-user associations)

Possible key objectives – A summary

- Regulating borehole permits
- Monitoring and regulating groundwater abstractions
- Increasing efficiency in water use, particularly in irrigated agriculture
- Increase recharge?
 - Issues: Financing infrastructure, who pays and how are costs recovered
- Alternative supply?
 - Water reuse?
 - Issues: Acceptability, financing, cost recovery

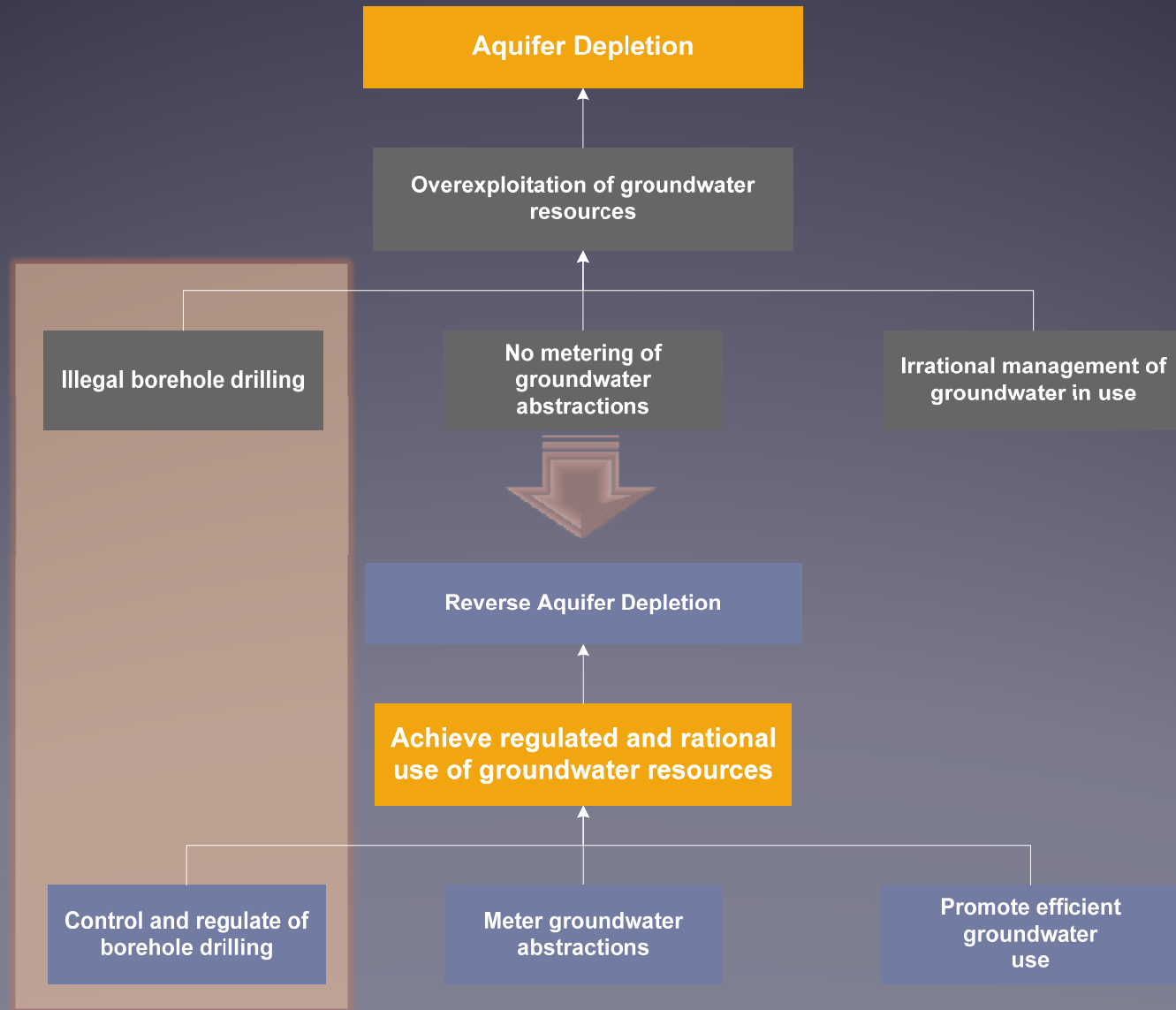
Discussion Topics

- Next session
 - Proposals for and Agreement on key objectives
 - Suggestions on options (economic and institutional) for improving groundwater management
- Agreement on next meeting, to be organized by CITET
- Next meetings
 - Presentation of proposals (synthesis of options)
 - Discussion on
 - Economic implications
 - Social implications
 - Enabling environment



Building the Objective Tree

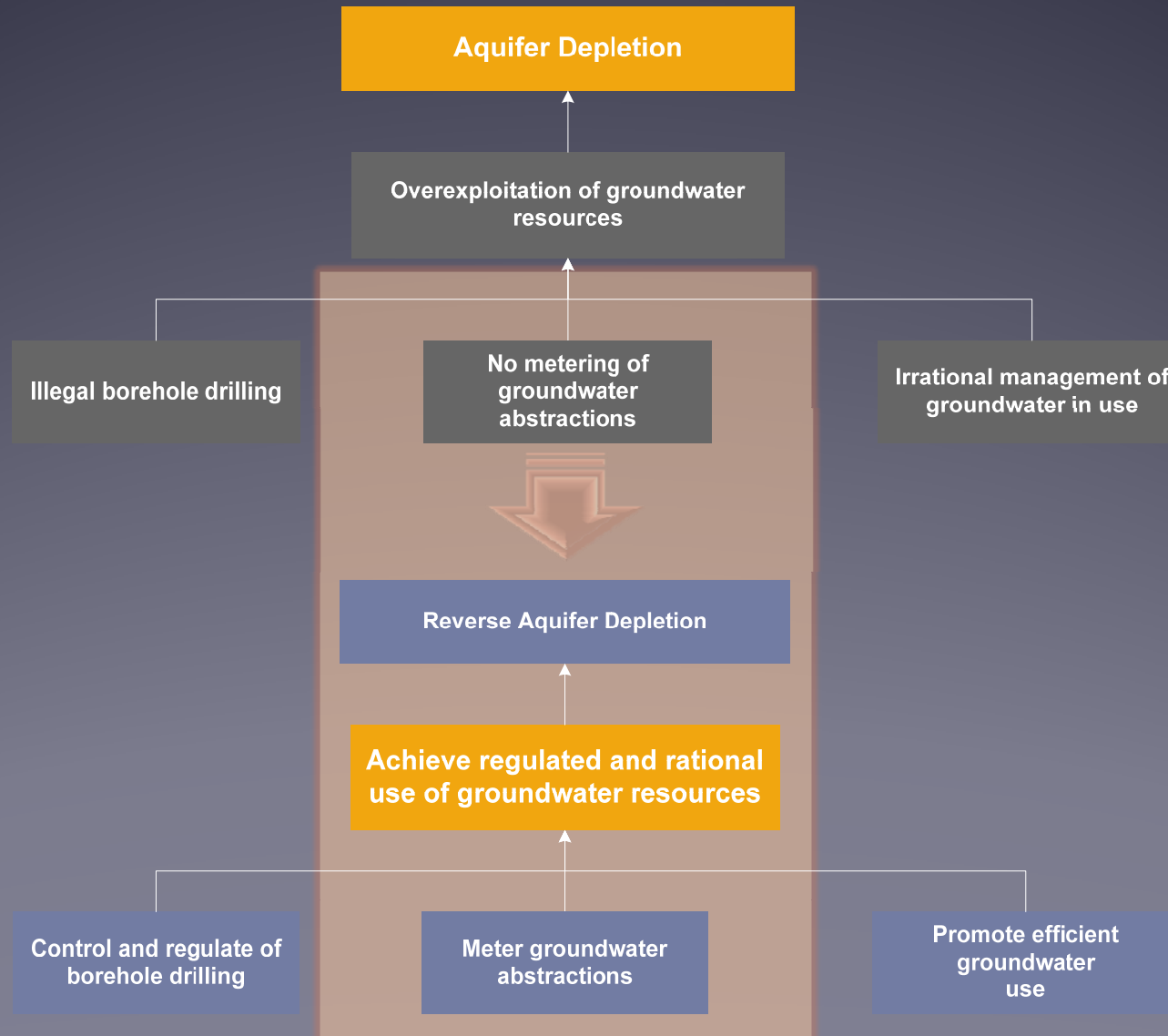
Main problem vs. Main objectives



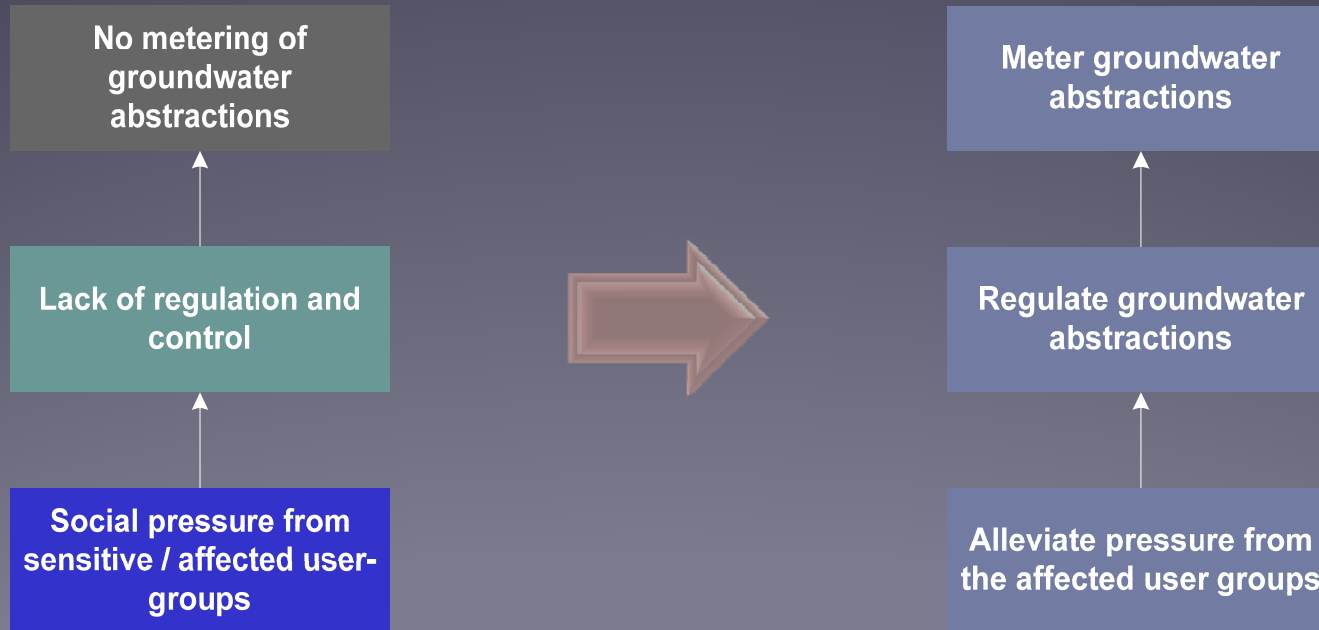
Problem causes vs. Objectives



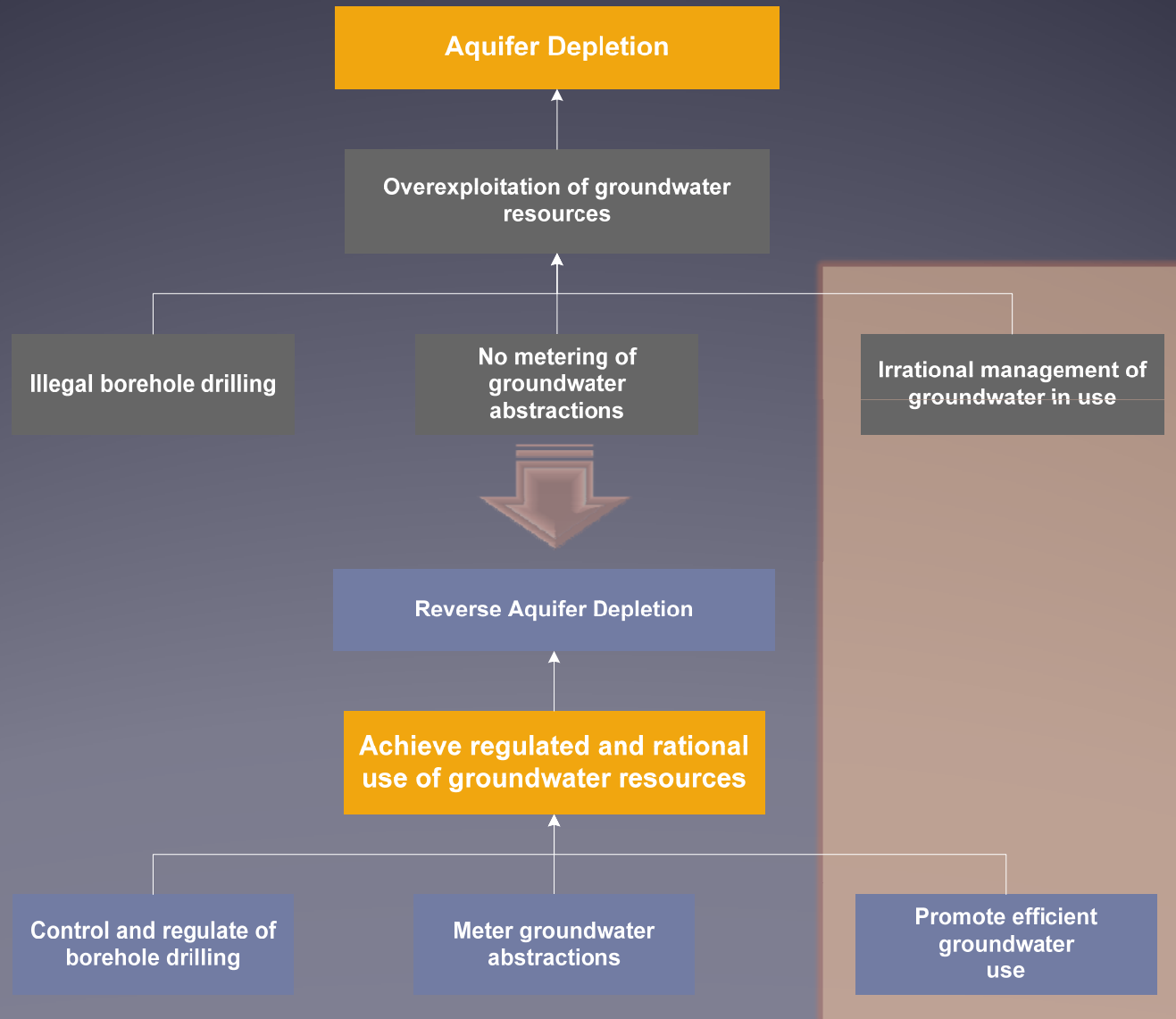
Main problem vs. Main objectives



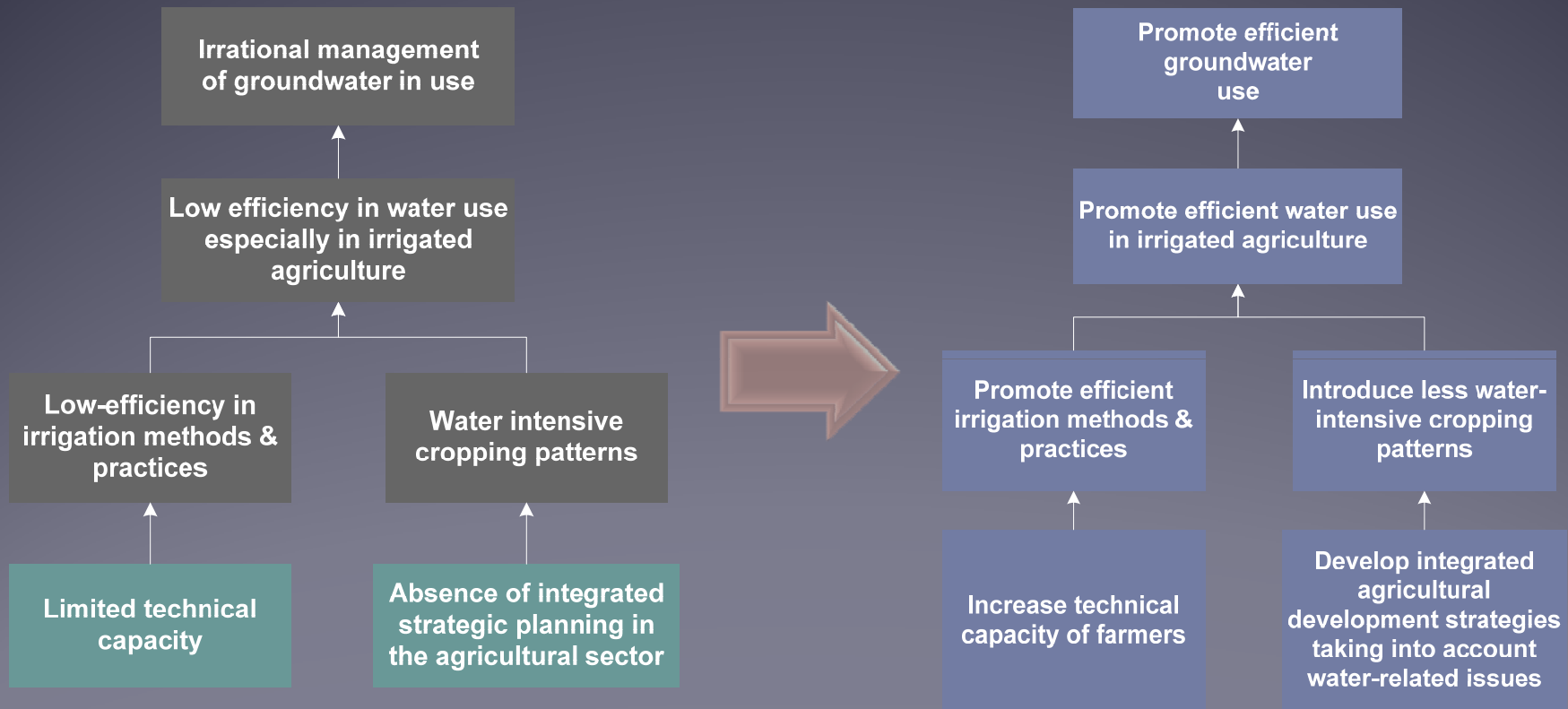
Problem causes vs. Objectives



Main problem vs. Main objectives



Problem causes vs. Objectives



The overall objective tree

