



**Water and
Environment Centre**

Sana'a University
Republic of Yemen

Water Policy, Governance and Laws

I: Water policy and governance

II: Water laws and institutions

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Introduction

The course *Water policy, Governance and Laws* is one of the main courses for the Integrated Water Resources Management curriculum of the IWRM program. The course is divided into two parts: I: Water policy and governance; II: Water laws and institutions. A total of 80 hours is reserved for the course.

The overall aim of the course is to make you familiar with theoretical concepts and practical tools related to policy-making, to give you an idea of how water can be governed and which institutions in Yemen govern water management, and to introduce you to the official water rights and laws that exist in Yemen.

Each part has a complete outline, which highlights its objectives and its activities. Each part has three chapters. The chapters provide assisting information to the lectures, by explaining key-terms and providing supporting graphics. The chapters are complemented by mandatory background literature. Every chapter has a group assignment, which in some cases includes a discussion and in other cases a presentation. The final chapter, no. 6, has the aim to show you the link between legal principles, policy-making and interventions. It ends with a reflection and discussion assignment, in which you will critically think about interventions and your position as a future water manager.

PART 1: Water policy and governance

Outline PART 1

Introduction

This part of the course concerns *water policy and governance* and aims at making the students aware of social and political dimensions of water management. The topics of this course will be linked to the water policy, using the water law and institutions, by addressing the policy process and instruments within the dynamics of water institutions and legislation. It will analyze the basis of the existing policies to develop the students' skills to analyze, design and evaluate water policy and strategies. These skills will enhance their capacities to look at water associated problems and issues from institutional, organizational, social and political aspects in different areas of IWRM.

Water policy and governance depends on institutions and organizations that have their roles and responsibilities towards water issues. The relationships between them follow rules of action according to the governance system in the country. Policy distributes the power of different stakeholders over various policy processes through the interactions between them in decision making.

This course will explain the topics of environmental policy theories and instruments, and water governance. The policy processes determining the existing networks among actors determine the required instruments to address the policies and strategic interventions for solving water resources problems. IWRM aims at achieving an efficiency of utilizing the current resources (technical, financial, human) in such a way that it is sustainable for future generations. This can not be achieved when there is no clear vision from the different stakeholders. The policy also needs to have strong and transparent instruments to enhance the partnerships between the government and other influential actors, ranging from NGOs to the private sector.

Outputs of Part 1:

The students will have developed:

- A better understanding of policy processes and strategies.
- Skills to analyze design and to evaluate water policies and strategies.
- The ability to critically evaluate institutional approaches by using the economical, regulatory and economical instruments for applying IWRM.
- Analytical skills for analyzing the networks of different stakeholders while determining their influence and interest.
- The ability to link water issues related to technical, environmental, financial, institutional, social and economical aspects to other dimensions of policy making processes.

Timeframe Part 1:

The course consists of lectures, working groups and assignments. The lectures will focus on the concepts, processes and forms of water policy and governance while giving examples on how to apply these. These examples will be used as guidelines for the students during the working groups and assignments in order to apply them in Yemen's water policy context.

- 8 days of lectures, 2 hours per day: total 16 hours
- 20 hours for working groups (2 groups working on 2 different cases)
- 20 hours of self study for reading materials and doing the exercises

Week 1: Theory Water policy and governance

- 10 hours of lectures on policy analysis, design and evaluation, policy instruments, and participatory policy making
- 10 hours of working groups in a class, and class discussion (analysis and evaluation of water governance in a case)
- 10 hours of individual assignments on literature

Week 2: Water policy and governance in Yemen

- 6 hours of lectures on water governance forms
- 10 hours of working groups in a class, and class discussion (analysis and evaluation of water governance in a case)
- 10 hours of individual assignments on literature

Literature Part 1:

Week 1: Theory Water policy and governance

- Chapter (1) Policy actors and instruments
- Chapter (2) Policy evaluation tools

Week 2: Water policy and governance in Yemen

- Chapter (3) Water institutions and governance

Overview of the sessions

Session 1: Water policy concepts and policy instruments

The first part of this session will give information about this course related to the lectures, working groups and reading materials, and will explain the participation during the lectures and working group meetings. The time table of this course will be presented to the students with the following course topics: (a) environmental policy theories, instruments, evaluation and measuring effectiveness; and participatory policy making; and (b) water governance forms.

The definition of policy will be the basis for understanding the policy process, actors' networks, and policy strategies and instrument. The policy process will be explained by linking its elements to one of the issues within Yemen's context. The cycle of an issue, from recognizing it to formulating the policy and implementation and control, will clarify the various degrees of addressing water issues/problems. The policy process needs to be linked to a network of different actors to be implemented. Therefore, it is necessary to understand and analyze the network actors, their interactions and interests.

The policy process and networks will be used in the other sessions so it is important that they are sufficiently explained to and exercised by the students in order to assess their understanding. The session will end by dividing the students in three working groups and letting them identify one of the water issues while explaining its policy life cycle and network. These three working groups will work in the next session to develop the analysis of the selected water issue.

Session 2: Policy strategies and instruments

This session is continuing the previous session in understanding the policy by presenting the policy instruments that are based on regulation, economy and communication. The regulations form a legal framework for the policy issue while enforcing the different actors to apply them. However, it needs to be complemented by economical and communication instruments to be effective and efficient. This session will explain how to link between these instruments and how to take the advantages of their applications and minimize their disadvantages according to the specific circumstances.

The importance of identifying the communication methods during the policy process should be emphasized by the actors to ensure the participation of stakeholders in different stages of the policy process. The students will also discuss these communication methods in their case study, together with the other instruments. In order to be applicable and functional, these instruments should integrate different elements.

Session 3: Evaluation Research

The policy, that can be seen as a set of interventions and should include different aspects in order to address the policy issue practically, should be evaluated to reach

desirable outcomes or impacts of these interventions. The three methods of evaluation are: (a) ex-ante evaluation or design research, (b) process evaluation or monitoring, and (c) ex-post evaluation. Ex-ante compares the different interventions in order to select the best one. Different questions related to their characteristics and selections facilitate the participation of different actors in this kind of evaluation. The process evaluation is important for describing the positive and negative effects during implementation. The last evaluation type, ex-post evaluation, is important for assessing the effects of implementation. The students should compare these evaluation types and assess which one can be used for their case study. Furthermore, they should link the case study to past, ongoing and future interventions in the water arena to know which evaluation type is suitable.

The intervention theories will be explored through arrow diagrams or the European Environmental Agency (EEA) model. Both of them have different methodologies. However, they can be used side by side as the arrow diagram assesses the negative and positive effects of the interventions and the EEA model looks at effects in the processes' cycles. The main point here is to make the intervention operational by identifying its qualitative and quantitative indicators. The students will select the suitable intervention evaluation theory and method to analyze their case study accordingly.

Session 4: Evaluation Design and Theories

The evaluation designs for ex-post and ex-ante evaluations describe how to design research strategies. On the one hand, most of the current ex-post evaluation researches are case studies that are sometimes combined with a survey. The type of case study determines its selection, sampling and questions. The data generation and analysis methods are either policy-scientific or elicitation based on the researches' topics and assessment of stakeholders' perspectives. On the other hand, the ex-ante evaluation design depends on assessing the interventions' alternatives in accordance to specific criteria to select the best options to enhance the participatory planning of stakeholders. The cost benefit, cost effectiveness and multi criteria analyses give options for assessing the appropriate interventions. The students will continue with the same case study they worked on to select the evaluation processes and methods to add deeper analysis to their case study.

Session 5: Presentation of the working group

This session will be used for following up on the outputs of working groups and their exercises and to discuss the previous sessions with the students.

Session 6: Water governance – Market based governance

Water governance deals with economic, political, economical, social and administrative aspects with a broad participation of actors for managing water resources. The forms of hierarchical and market based governance will explore the ideas behind participation of the private sector. The example of urban water supply gives a clear example of the areas where competition can be used. The forms of private sector involvements explain also the desired option that is suitable to the

competitive structure, post privatization regulation and the type of private company with operational arrangements. The students will explore the possible forms of PSP for their case while identifying which functions can be privatized.

Session 7: Water governance: Distributed Governance

Two forms of the distributed governance will be explained in this session. The first form, demand side management, deals with the users as co-managers of the system by participation in micro level for balancing between supply and demand, interactive control and practice locally determined options. The second form, river basin management does not deal with hierarchical levels but about how to manage according to the water flow while establishing a decentralized basin entity. The students will discuss how river basin management is applied in Yemen and how the demand side is managed.

Session 8: Presentation and wrap-up

This final session is divided into two parts:

1. Presentation of case studies of the three working groups with discussion for the course topics:

- Policy instruments and triad networks
- Policy evaluation and research proposal
- Water governance options

2. Discussion of the reading materials for what are the main ideas and how can they be reflected in the Yemen context.

Chapter (1) Policy actors and instruments

This chapter discusses how we can analyze policies and what kind of instruments there are available to implement policies.

1.1 Definition

Policy is: (Hoogerwerf 1995):
The attempts to reach specific goals...
with certain means...
and in a certain time path

With this definition, any actor, not just the state can be a policy maker!

Two theories in relation to policy:

- A. **Process theory**: explaining the general processes of policy making
- B. **Network theory**: analyzing who is making policy with or for whom

1.2.A Policy process theories

POLICY LIFE CYCLE



Issue-attention cycle

- Pre-problem stage
- Alarmed discovery
- Realizing costs and difficulties solving them
- Gradual decline public interest
- Post-problem stage

Example

Public agenda: environmental worries in the EU (2002, Eurobarometer)

MOST IMPORTANT

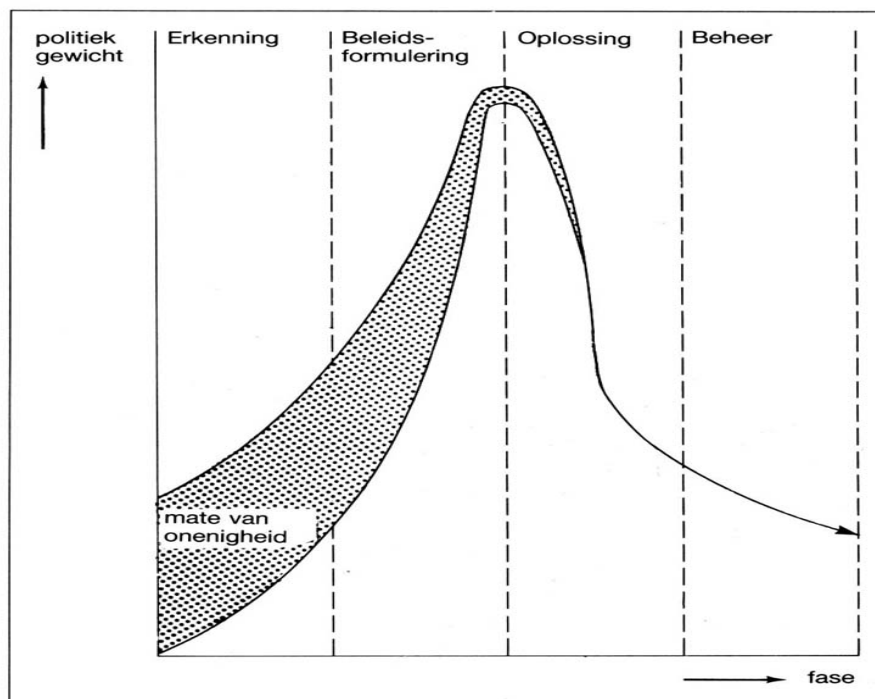
- Nuclear power 50%
- industrial disasters 45%
- Air pollution 44%
- pollution of tap water 43%
- pollution of seas/coasts 42%

- tropical forests 41%
- Climate change 39%

LEAST IMPORTANT

- Damage tourism 17%
- hunting 17%
- noise 18%
- traffic/public transport 21%
- domestic waste 22%
- Acid rain 29%
- GMOs 30%

Self-study question: how would the list of most and least important environmental problems in Yemen look like?



*This figure shows that in the first two phases (acknowledgement and policy formulation) there is more controversy among the actors than in the later two phases (solution and management). Therefore the **political** weight of the two first phases is larger than of the two latter ones.*

Question: Who makes policy?

- **'Politics'** (Parliament): sets goals, makes choices (importance of proper water management in comparison to other issues)?
- **Government** (ministries, local governments): formulates water policy?
- **Other Actors** (companies, other organizations) may formulate own 'policies'?

Answer: all actors may be involved in the process of policy making. So from the process of policy making, we should turn to policy networks.

From process to networks

Policy making from a network perspective entails:

- Assumption that there is no sharp and hierarchical distinction between state and society
- Assumption that there is no single State, but that the state in itself contains different actors and interests: different levels (local, national) may compete with each other and different fields of policy making may compete (for instance: Ministry of Environment vs. Ministry of Economic Affairs)

1.2.B Policy network theories

Policy networks

Networks are more or less stable patterns of social relations between mutually dependent actors, constructed around policy problems and/or policy programs

Network theory

- State is not a single, but a multiple actor
- Mutual dependency between state and societal actors
- No hierarchical relation, but dualistic role of state organisations
- Intermediate organizations
- No fixed triangles or coalitions

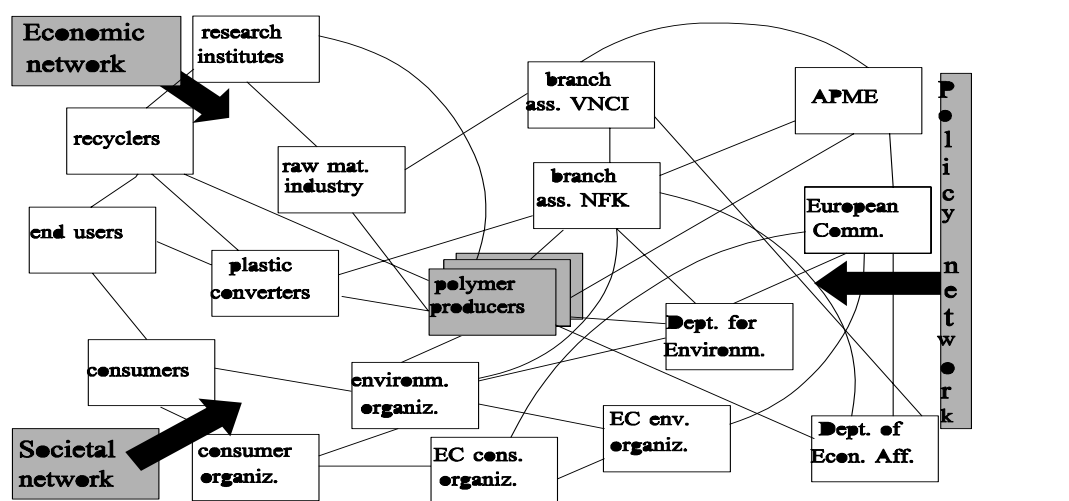
Examples

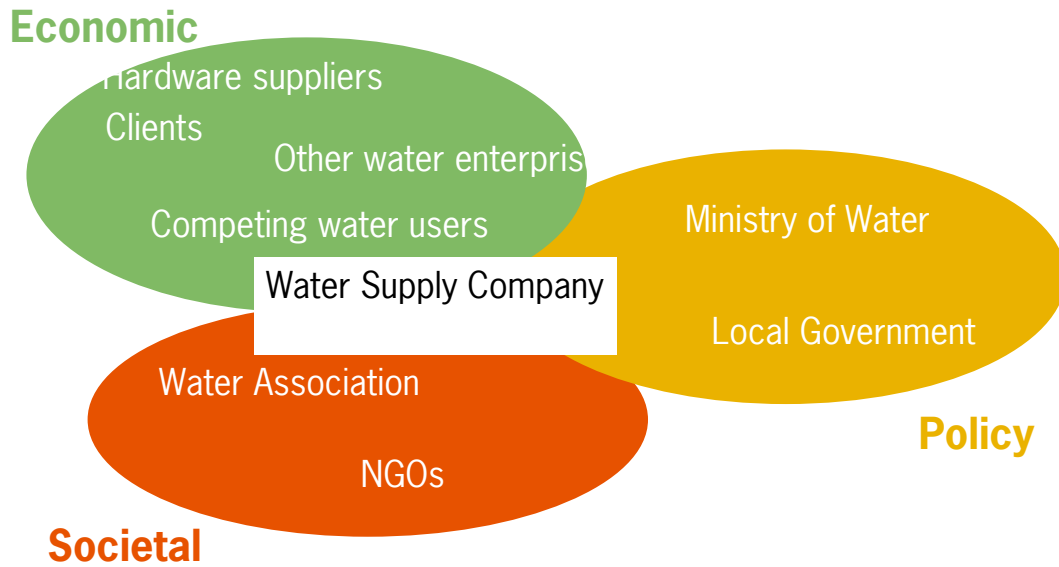
- Policy networks: policy-actors and a political-administrative point of view
- Economic networks: economic actors and an economic/monetary perspective
- Societal networks: civil society actors and a socio-cultural perspective

Analysing networks

- **Rules of the game:** formal and informal rules
- **Resources:** money, authority, knowledge, information
- **The strategies:** offensive, consensual, cooperative, adversarial
- **The ideological identity** or world view of the network

Examples





1.3 Policy and management

Environmental Policy is a form of steering:
intentional, organized form of societal change to improve the environmental quality

Two main elements of environmental policy:

- **Policy instruments** (the means)
- **Policy strategies** (goals and design of policy processes)

1.3.A Policy instruments

Policy instruments				
Themes	<i>Using Env. regulations</i>	<i>Creating markets</i>	<i>Using markets</i>	<i>Engaging the public</i>
<i>Resource management and Pollution control</i>	<ul style="list-style-type: none"> - Standards - Bans - Permits and quotas 	<ul style="list-style-type: none"> - Property rights/ decentralization - Tradable permits/rights - International offset systems 	<ul style="list-style-type: none"> - subsidy reduction - Env. Taxes - User fees - Deposit-refund - Targeted subsidies 	<ul style="list-style-type: none"> - Public participation - Information disclosure

History of environmental policy making may be categorized in three general waves:

Wave 1: Using environmental regulations

Mainstay of environmental policies and resource protection in virtually all countries,

involves the setting of environmental standards enforced via legislation without the aid of market-based incentives.

Examples

Water and air quality standards and emission standards, land use standards, protected areas, bans on fishing and pesticide, quota for water consumption.

Why is regulation so preferred by governments?

- for politician, to hide the true cost, and avoid conflicts
- for bureaucracy, source of power and influence
- pressure groups, NGOs, as a predictable way of policy making. ('stop this, do that' is an easy message to communicate)

Mixed experience with effectiveness of regulation. In many cases rules and regulations look good on paper but are hardly implemented.

Important factors which can impair the functioning of regulatory instruments:

- high bureaucratic costs
- large informational requirement: which means that before setting emission standards to certain target groups, one should know exactly what is emitted, what is the impact to the environment and who is to blame.
- problems of socio-cultural acceptance.

Wave 2: Market based instruments, creating and using markets

Creation of incentives to producers and consumers to make better use of resources.

It aims to internalize the so far external costs into the price of a good through economic instruments. External costs are the costs that would have to be made for cleaning up the environment but has not been paid for by the one who's responsible for it. Internalizing would mean that these costs are covered in product prices.

Principle 16 of Rio Declaration states:

“National authorities should endeavour to promote the internalization of environmental cost and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution with due regard to public interest and without distorting international trade and investment (UN, 1992)”.

Attractiveness of Market based instruments

- Achieve the desired effects at the least possible cost
- Easier to enforce
- Equal to everybody
- It generates revenue

Using markets

Use the market and price signals to make the appropriate allocation of resources.

Examples

Subsidy removal (energy and water pricing reform in many countries), pesticide and fertilizer subsidy reductions and Indonesia. Taxes on industrial emissions.

Creating markets

To reduce the *lack of markets* for environmental resources and services by

- Defining property rights over environmental resources,
- Privatization (participation of private parties) and decentralization (allocation of government tasks to lower levels)
- Establishing tradable permits and rights, and creating international offsets.

Examples

Water rights , land titles , participatory irrigation management

Tradable quotas/permits for fisheries, tradable emission permits: such as concerning CO2 emissions in Europe: there is now a European market for CO2: all industries have been given a quota of CO2 to emit. They can buy or sell parts of these quota from each other according to their needs. If an industry saves on energy use, it may sell part of its CO2 quatum -> energy saving means profit making.

Wave 3: Engaging the Public

Governments rarely lead in the fight for an improved environment; more often political leaders respond to public demands for action to address environmental issues.

Information disclosure, community pressure, and public participation are crucial in creating the political will to take effective action. Disclosure / engaging the public not only makes policy measures more effective, it is also needed to legitimize (impopular) policy measures.

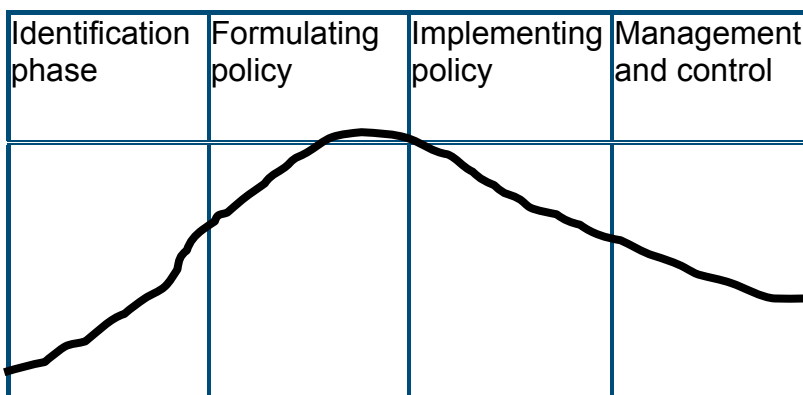
Examples

Eco-labeling for agricultural production in many OECD countries,

Public disclosure program for air and water pollution control.

Organizing referenda about major issues like deciding to build nuclear power plants.

1.3.B Communications methods in different phases of the policy life cycle



The role of government during different phase of the policy life cycle (IUCN, 1995)

1: Identification/agenda setting

- Regular opinion and attitude surveys
- Mass media content analysis
- Management by speech
- Systematic and continuous network with NGO, interest groups and scientific institutions (public relations)
- Regular briefings and interviews and meetings with interest groups and the press
- referenda

2. Formulating environmental policy

- Knowledge/attitude/practice (KAP) surveys
- Integrating communication in the mix of policy instruments
- Design of a communication strategy
- Communication to /consultation with those who will be involved (public relations)

3. Implementing environmental policy

- Information campaigns
- Specific information materials
- Marketing and advertising
- Instruction
- Education
- Consultation of target groups : workshops, panels

4. Management and control

- Monitoring and communication of results
- Regular opinion and attitude surveys
- Informing through discussion on changes of policy design and implementation
- Education

1.3.C Other policy instruments

Joint Environmental Policy Making: societal or private actors joining governments in policy making.

Voluntary agreements

Are based on the principle that industry accepts that it bears responsibility and that it is prepared to avoid damage, reduce impacts or ensure the sustainable use of resources.

A high level of trust is essential, based on a close understanding of the nature of industry and its processes, as is the possibility of imposing a regulatory mechanism or sanctions in case of failure.

Will normally only work where a high level of industrial self-discipline exists, based on a long experience and understanding of government objectives.

Self-regulation

Self-regulation may be promoted by governments as a means of placing some of the burden of ensuring compliance with environmental standards on industry.

However, it is better seen as a means for industry to improve performance and competitiveness by reducing such costs as:

- environmental charges and fines resulting from high levels of pollution,
- waste disposal costs where low levels of recycling or reuse are achieved,
- energy or water consumption through efficiency gains,
- natural resource input gains through improved processes.

1.3.D Which policy instrument to choose?

There is no single ideal instrument, we need the full orchestra! The mix should be:

- Economically viable
- Socially acceptable
- Culturally adaptive
- Legally based
- Psychologically comfortable

Background literature Ch. 1

Connelly and Smith (2003) *Politics and the Environment, from theory to practice*
Chapter 5: Means

Assignment Ch. 1

Make small groups and draft a small report with the following guidelines:

1. Briefly describe the current policy in one of the following fields of water policy in Yemen:
 - Urban Water Supply
 - Urban Wastewater management
 - Water drilling for agriculture
 - Wadi management
 - ...
2. Assess and review the policy actors (use network models)
3. Assess and review the instruments used
4. What would be the ideal mix of actor networks and policy instruments in the given case?

Chapter (2) Policy evaluation tools

This chapter deals with how policy analysts or researchers can evaluate the effectiveness of policy making.

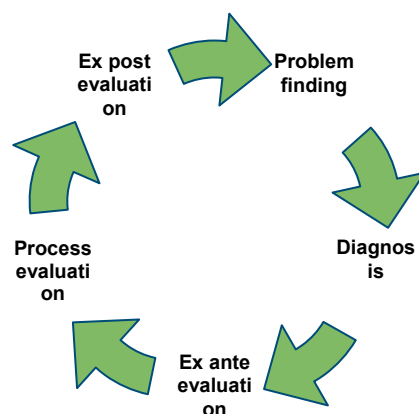
2.1 Process of evaluation research

Policy can be seen as a set of interventions:

An *intervention* is a particular manipulation of reality (a cure, a therapy, a policy program etc.)

Evaluation research tries to establish the quality of (the outcomes of) these interventions

Intervention cycle



Ex-ante evaluation (or design research): to compare different interventions that might solve the problem

Process evaluation (or monitoring): to describe changes that occur during implementation of an intervention

Ex-post evaluation: to assess the effects of the implementation of an intervention

Typical research questions

Ex-ante evaluation

- What are the characteristics of each possible intervention?
- What are the pros and cons of each possible intervention?
- Which intervention is the best intervention to implement?

Process evaluation / monitoring

- What are the effects of the intervention?

Ex-post evaluation

- What were the objectives of the intervention?
- What were the effects of the intervention?
- What are the effects of the intervention compared to the policy objectives?
- Why did the intervention work (or did not work) as it did?

Important topics in evaluation methodology

All types of evaluation: positive and negative effects of interventions (today)

Ex ante: comparing those effects
Ex post: clarification of policy objectives
Ex post: explaining those effects

2.2 Intervention theories (policy theories, program theories)

Intervention theories: representations of the ideas about why an intervention works or should work. This is relevant for any study to the effects of policy. It sets the baseline of assumptions behind any policy: what is the rationale behind a policy measure, what were the assumptions about causes and effects of a policy measure?

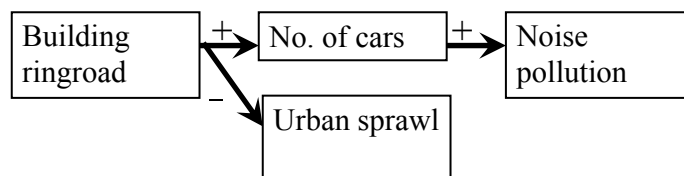
How to represent intervention theories? (two examples)

- A) Arrow diagrams
- B) The EEA model

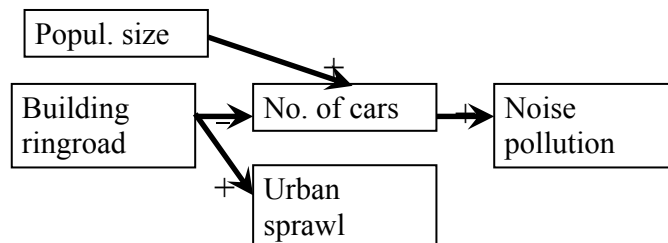
They both conceptualise the assumptions, ideas behind policy measures by putting cause and effect relations in a diagram.

2.2. A Arrow diagrams

Example of arrow diagrams



Unintended effects of building a ring road

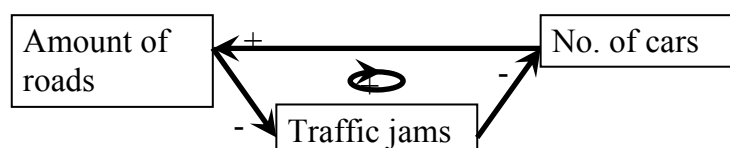


Autonomous processes (other independent variables) playing a role

Feedback loops

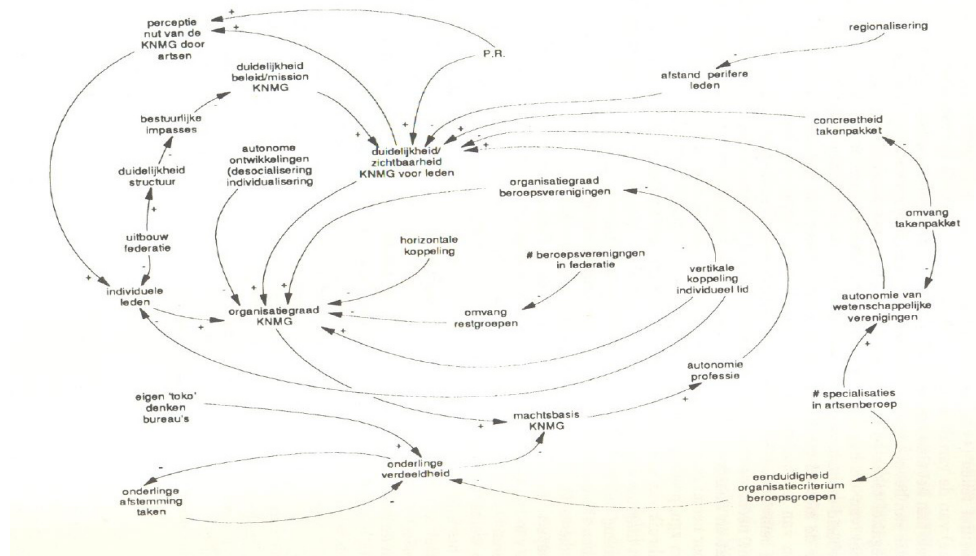


Negative feedback loops



Positive feedback loops

Negative feedback loops have a stabilizing effect!



Example of a complete arrow diagram

Some additional comments

- Arrow diagrams cannot only be used to make a ‘final’ diagram, but also to make a ‘causal’ diagram
- Policy makers do not always use explicit program theories
- Different actors might have different program theories
- Arrow diagram produce many ‘black boxes’ and do not show why (causal or final) relations exist
- Implementation problems are not included in program theories

2.2. B The EEA model (European Environmental Agency)

Effects: the results of an intervention; those results can directly be linked to the implementation of the intervention

Input effects: amount of resources put in policy

Output effects: tangible results of a measure

Outcome effects: changes in behaviour of target group

Impact effects: changes in the environment

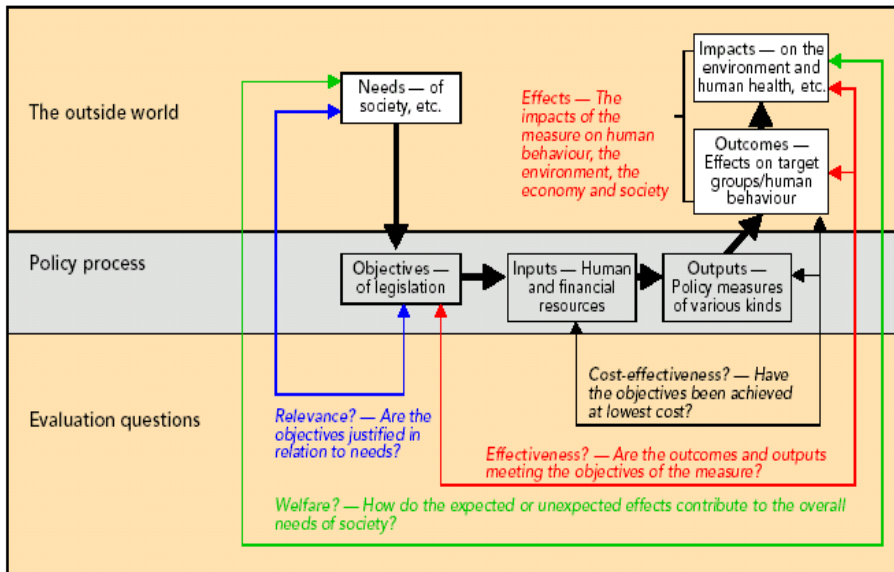
Example: waste water treatment

Impact: quality of water (cleanliness)

Outcome: amount of water treated in plants (in m3)

Output: amount of water treatment plants built

Input: amount of money spent on building water treatment plants



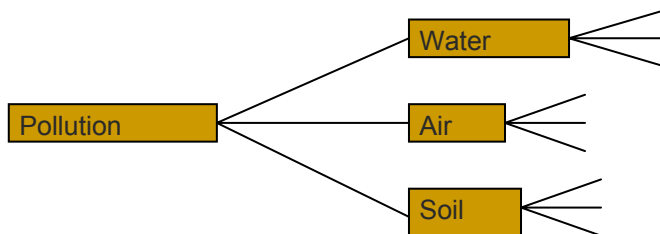
2.3 Operationalisation of concepts for policy evaluation

Intervention theories contain many concepts.

- Boxes in arrow diagram
- Steps in the EEA model

These concepts need to be defined and operationalised in sets of indicators

Step 1) Subdivide the concept into components or aspects.



Step 2) Continue with this process until you reach the level of indicators.

Step 3) Make a list of all the indicators that YOU will use in your research.

Criteria for a good operationalisation

Validity: the indicators should cover the concept

Reliability: the indicator should give the same result when measured repeatedly

Policy relevance: policy makers should be able to manipulate the indicators used

2.4 Ex-post evaluation

Ex-post evaluation: to assess the effects of the implementation of an intervention

Design topics

- Research strategies
- Case selection
- Data generation
- (Data analysis)

Research strategies

Survey: structured observation among large random sample, e.g. questionnaire

Experiment: manipulation of independent variable to check effects

Case study: in depth study of one or a few cases

Most ex-post evaluation researches are *case studies*, sometimes combined with a survey. Case studies produce in-depth qualitative information about causes and effects; they answer the how and why questions, while surveys quantitatively assess the what and how much questions.

Basic characteristics of the case study

- One case or a few cases is/are investigated
- We want to develop a full understanding of that case or of those cases
- Research questions appropriate for an evaluation case study usually begin with 'how' or 'why', e.g. why were objectives achieved (or not)?

Sampling takes place at two levels:

1. Selecting the case or cases we want to investigate
2. Selecting the data sources (people, documents) we will investigate within the case

There should always be a rationale behind the selection of cases or data sources.

Example of a case study

Research questions:

- 1) What is the extent of cross-border co-operation in river basins in the Arabian peninsula?
- 2) How is this extent of cross-border co-operation influenced by contents and organisation of water politics in the countries involved?

Phenomenon of interest?

Cross-border co-operation

Type of case?

Cross-border regions in Arabian Peninsula

Initiatives for cross-border co-operation

Type of case study?

Multiple case study

Strategy for case selection?

Criteria used in case selection:

Type of water related issues (water quality, flooding etc)

Countries involved

Extent of co-operation that exists (successful or not)

Data generated in evaluation research

Methods of reconstruction of intervention theories

Policy-scientific approach:

- Scientists reconstruct intervention theories and the actual intervention situation
- Based on content analysis and interviews

Elicitation methodology

- Scientists reconstruct intervention theories and the actual intervention situation
- Based on observation of concrete decision making situations (which may be 'artificial')

Strategic assessment approach

- Groups of stakeholders discuss assumptions on which policy is based and/or the implementation of the policy
- Groups are brought together and discuss their ideas
- Scientists facilitate these discussions

Choosing a research strategy largely depends on the research questions (i.e. only addressing the decision making process within policy making bodies or trying to measure the impact on target groups of policy) and circumstances: i.e. availability of respondents, resources and time.

Problems in ex-post evaluation

Causality

Lack of sufficient data (data is seldom collected from the beginning)

Effect of other (independent) variables

Generally small effect of interventions on objectives

Representativeness

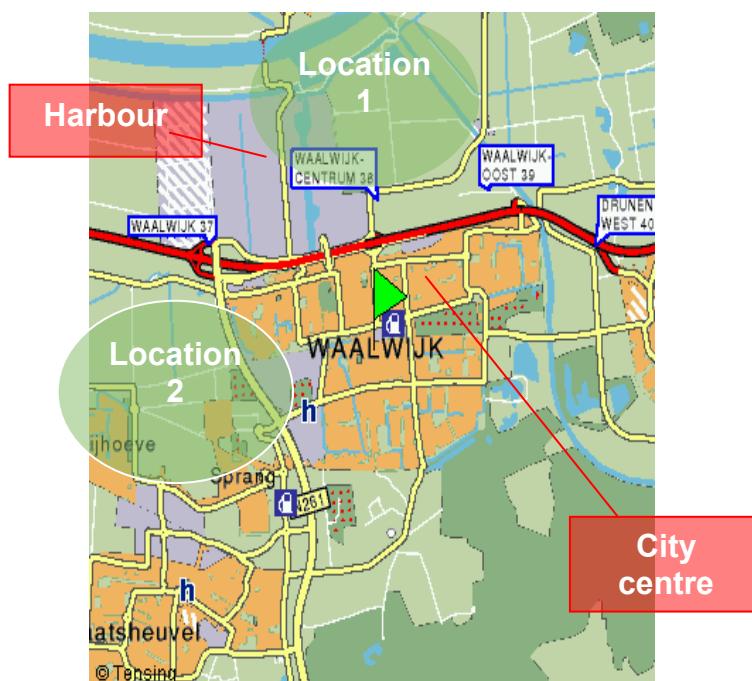
The cases/units of observation selected are not always representative for all cases

Questionable if generalisation of findings to other policy domains is allowed

2.5 Ex-ante evaluations

Ex-ante evaluations compare different interventions that might solve the problem

Example: environmental impact assessment of a new urban lay-out



Designing an ex-ante evaluation

- Step 1) Designing alternative interventions
- Step 2) Designing and operationalisation of relevant evaluation criteria
- Step 3) Scoring the alternatives on the criteria
- Step 4) Making an assessment of the alternatives

Sources to base the design of interventions and criteria on

Current interventions, objectives and/or other elements of the intervention theory
Additional interviews with stakeholders
Group interviews, e.g. focus groups, delphi or workshops

Comparing interventions

Cost-benefit analysis: the effects of each intervention or expressed in monetary terms and presented in a balance

Cost-effectiveness analysis: calculates the costs of each intervention at a given level of effectiveness (goal attainment) or the level of effectiveness at a given level of costs

Multi-criteria analysis: interventions are rated on several criteria and then standardised and weighed to calculate the 'best' alternative given the criteria used

Problems in ex-ante evaluation

Concerning alternatives and criteria

- Decisions on alternatives and criteria to be used are always arbitrary
- Ex-ante evaluation have difficulties coping with differences in opinions among stakeholders
- Future generations, 'foreigners' and non-human 'actants' do not have a say in ex-ante evaluations

Concerning scoring effects

- Prediction of effects of alternatives is difficult, especially complex environmental effects
- Rating future costs and benefits in present day terms (discounting) is always open to discussion
- It is difficult to express each effect of an intervention in monetary terms (CBA or CEA)

Aggregation oversimplifies the decision procedure

2.6 Conclusion

Policy Evaluation is a field with a specific approach and with a range of specific research methods

This lecture was only an introduction: more to be lectured in Environmental Impact Assessment course and Wastewater Treatment course

Background literature Ch. 2

Howlett, M. and M. Ramesh (2003). *Studying Public Policy. Policy Cycles and Policy Subsystems*. New York, Oxford University Press. (second edition, chapter 9)

Assignment Ch. 2

Make a proposal for policy evaluation research on a water topic in Yemen

- Wadi management
- Urban Water supply
- Water drilling
- Urban sanitation
- ...

Motivate your choices for ex-post / process/ ex-ante approach, case study methods

Chapter (3) Water institutions and governance

This chapter explains what is meant by governance and what types of governance can be distinguished.

3.1 Definition of water governance

Governance vis-a-vis policy

Remember the narrow and broader definitions of “policy”:

- *Narrow*: interventions by government
- *Broader*: all actions and influences in a triad network around a specific topic

If policy were defined in terms of governmental intervention only, then governance is a much broader term

If not, then governance is pretty much the same!

“Governance encompasses laws, regulations, institutions but also relates to governmental actions, institutions, domestic activities and networks of influence, including international market forces, the private sector and civil society”
(Rogers and Hall, 2003)

Water Governance

“Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society”
(Global water Partnership, 2002)

Who’s in charge?

If not only governmental bodies: who else?

Civil Society, companies, institutes...

Rogers and Hall, 2003, p. 9: Also ‘*strangers or people with different interests*’ who can ‘*peacefully discuss and agree to co-operate and coordinate their actions*’

[What would be your comment on such definition?]

Forms of governance**

From *Hierarchical* (or Top Down, Command and Control, regulation based)

Via *Market Based* (Creating or Using Markets, economic instruments)

To *Distributed* (or horizontal or negotiated policy making) governance models *

Notes

*Dublin Principles (1992) and other international water treaties favour distributed models

**Note the similarities with policy instruments discussion!

3.2 Market based governance

Example: Governing urban water infrastructures

Government owned systems

Special *Large Technical Systems*: physical networks (pipes, canals, pumps, basins) link providers and users to each other

Features:

- Universal services (public and merit goods)
- Uniformity of products, lack of substitutes
- Flows in stead of units
- Inelastic prices
- Natural Monopolies
- Captive Consumers

Infrastructures mostly publicly owned and managed

Public utilities accused of being “overstaffed, inefficient, inflexible, incapable to meet customer’s demands”

Failure of public management

- State organisations insulated from competitive incentives in labour, capital or product markets
- Exposed to short term political interventions, interest groups
- State firm managers may pursue their own utility rather than the public interest. Tax payers have no tools to signal dissatisfaction

Privatisation of the service provision

Privatisation is seen as the answer to the problems mentioned above, and to create a level playing field to international competition in providing the services. World Trade Organisation, IMF and Worldbank and other donors have been major promoters of privatisation of services like water supply, irrigation.

Is privatisation the answer?

It depends!

- Form of private party involvement
- Competitive structure of the sector
- Type of private company and range of its operations
- The post privatisation regulatory regime

Don’t privatise without proper plan, otherwise

Combined disadvantages of monopoly (no consumer choice, no incentive to innovate) AND lack of (democratic) control.

“Privatisation of water” is internationally debated:

- Water is a public service and should not be subject to company strategies and profit making
- Examples of bad governance presented as show cases

However: ideological arguments sometimes overshadow what’s really going on

Privatisation: transfer of (part of) water services from public to private parties

Better to speak of *Private Participation* in water sectors

It depends on wider governance schemes whether private participation can be successful. Note that in urban water supply not only huge private companies are involved, but also small-scale vendors, these are also ‘private’.

Competitive characteristics water industry functions (Rees, 1998)

■ Resource allocation and use regulation	Monopoly per hydrological unit
■ Construction of wells, treatment plants etc.	Competitive
■ Bulk supply	Oligopolistic
■ Bulk Distribution	Areal monopolies
■ Water treatment	Local monopolies
■ Local supply distribution	Local monopolies
■ Local sewary	Local monopolies
■ Sewerage treatment	Local monopolies
■ Appliance sales, Plumbing	Competitive
■ Consumer account and billing	Competitive

Liberalisation of service provision

Liberalisation: the administrative unbundling of infra-related and non-infra-related businesses and the introduction of competition for non-infra related businesses

Example: the infrastructure remains in hands of government, the water supply, billing, and metering is outsourced to a company

Differentiate between:

Competition BETWEEN networks

(i.e. mobile telecom)

Competition FOR the network

(i.e. water supply, bus lines)

Competition ON the network

(i.e. electricity, fixed telephone lines)

Forms of private sector involvement (Rees, 1998)

Full Divestiture

Full transfer of assets, management buy out

Partial divestiture

Government sells portion of shares and creates joint-venture

Concession

Long term contract to private company for all operation, investments, maintenance. Assets remain state-owned

Lease

Long term contracts for parts of operation or maintenance. Capital investments and ownership at the state

BOT, BOO

Contracts for the Building, Operation and Transfer, or ownership of the built assets to private parties

Management Contracts, Service contracts

Short term contracts for specific services to private parties

3.3 Distributed Governance

Demand Side Management as a form of distributed water governance

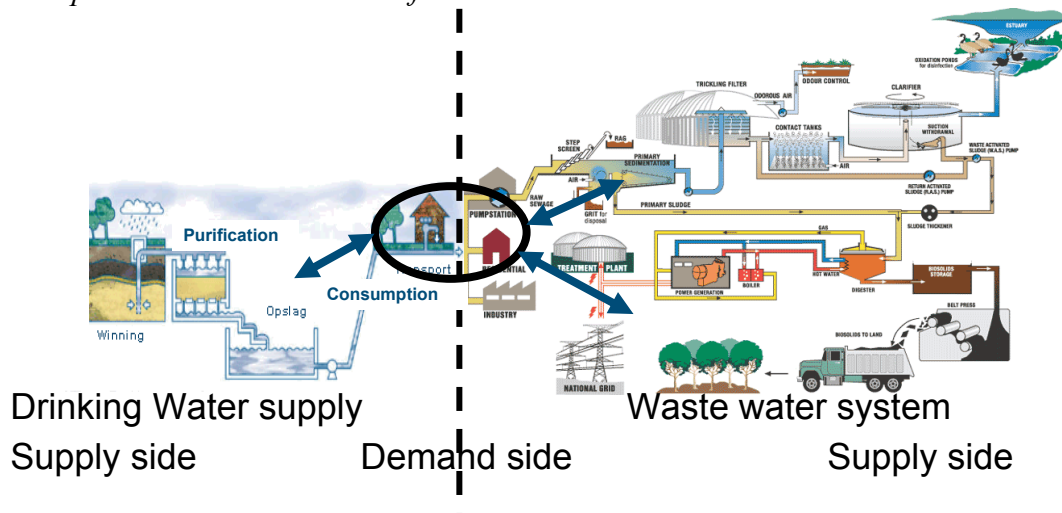
Assumption: No single actor is driving the system...but a complex network of users, providers, producers, regulators

Demand Side Management (in water infrastructures)

- influencing demand to prevent investments in new capacity and over-capacity in parts of networks
- peak shaving (reducing consumption in hot spots and stimulating it at cold spots)
- managing beyond the meter

= Distributed governance as users become co-managers of the system

Example: Flow scheme water infrastructure



Abstraction-purification-storage-supply- **consumption** - discharge-transport- treatment- drainage-reuse

Supply-led vs. Demand side management

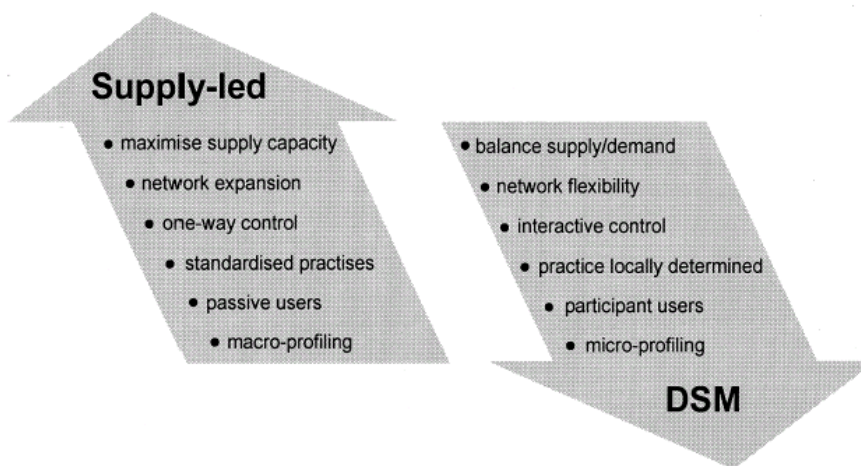


FIG. 1. Demand and supply-led modes of infrastructure management

River basin management as form of distributed water governance

NOT to comply to jurisdictional boundaries (Department of Water, Agriculture, Spatial Planning etc);

NOR to governmental levels such as states, districts, cities;

BUT to follow the water flow!

It needs the facilitation of special basin agency or commission that overrules the institutions in place.

Taking river basins and watersheds as object of governance, water engineers should give way to other parties at the table!

Background Literature Ch. 3

Rogers, P. and A.W. Hall (2003), *Effective Water Governance*. Stockholm: Global Water Partnership (TEC Background paper no. 7)

Rees, J. (1998), *Regulation and Private participation in water management*. Stockholm: Global Water Partnership (TAC background paper No. 1)

Assignment Ch. 3

Discuss possible forms of private participation as a governance option for your case

- Outline the different functions of the system
- Which functions can be privatised?
- Which should be privatised?

Discuss the watershed / river basin management as an option (for rural water cases) and discuss DSM (for urban infrastructures)

Final presentations all three assignments

Each Group gives a presentation (10 minutes) of exercises

1. Policy instruments and triad networks
2. Policy evaluation and research proposal
3. Water Governance options

Afterwards a Group discussion and evaluation

PART 2: Water laws and institutions

Outline PART 2

Introduction

Part I dealt with policy-making, policy instruments, evaluation tools and governance. Policies however do not come “out of the blue”. They are in general based upon laws, which are set on agreed rules about how to arrange the allocation, the use and the protection of assets. If laws are enacted by a legislature (representative assembly, e.g. parliament), then they are called legislations or statutory laws. Besides legislations there are tribal laws, customary laws, religious laws (like the *Sharia’ah*), etc.

Established laws require concreteness for the daily practice, and they need to be executed and enforced. This requires policy-making and policy instruments. Evaluation tools are necessary to check if this translation process is well performed.

Policy-making, execution and enforcement are done by institutions. An example of a policy-making institution is the Ministry of Environment; an example of an enforcing institution is the National Water Resource Agency (NWRA); an example of an executing institution is a Water User Association (WUA).

Part II firstly outlines some background on property law related concepts, and discusses the principles of the Yemen Water Law no (33) and the Civil Code no (14) in specific (chapter 4). Then it deals with Yemen’s governmental legislation and institutions (chapter 5). Finally, we will look at the translation process of laws into policies and policy instruments, by the example of the program for Sustainable Groundwater Management in Yemen of the National Water Sector Strategy and Investment Program (NWSSIP) (chapter 6). This part ends with a final reflection and discussion assignment on interventions and policy-making, which relates to the complete course

Outputs of Part II

The students will have developed:

- A better understanding of property law concepts, traditional, international and Islamic principles of water management, Yemen’s water law, the Civil Code and its concomitant legislations and institutions.
- Skills to analyze and evaluate the Yemen water law, Civil Code and its principles.
- The ability to apply the theoretical concepts about property law to law systems, like the Yemen water law
- The analytic skills to compare international and Islamic principles in relation to water management with the Yemen water law and the Civil Code
- An overview of the legislations and institutions in Yemen in relation to water management
- The ability to understand the translation process of laws into policies, policy instruments and the role of institutions in this process.

Timeframe Part II:

Part II, covering 34 hours in total, is a combination of lectures, working group assignments and group presentations. The lectures will focus on theoretical concepts related to property law, principles which form the basis of law-making in Yemen and water institutions and legislations in Yemen. The Yemen water law, the Civil Code, the Law concerning Local Authority and the program for Sustainable Groundwater Management in Yemen of the NWSSIP will be put central to understand the theory presented.

- 4 days of lecturing, 2 hours per day: total 8 hours
- 12 hours for group discussions, presentations and doing the assignments
- 12 hours of self study for reading the literature and studying the PPT's

Week 3: Water laws and institutions

- 8 hours of lectures on Yemen's water law no (33), the Civil Code no (14) and Law (no 4) concerning Local Authority; water institutions and reforms in Yemen; and the program for Sustainable Groundwater Management in Yemen
- 14 hours of working in groups, presentations and discussions (assignment chapter 4, 5 and 6)
- 10 hours of individual study on the literature and other materials

Literature Part II:

- Chapter (4) The principles of Yemen's water law
 - i. **Bahamish, A.A.** (2006) *Water rights and policies*, Yemen's Water Law no (33), the Civil Code no (14) and Law no (4) concerning local authority (pg. 1-15, 33-34)
 - ii. **Faruqui, N.I.** (1998) Workshop proceedings on the "Islam and Water Management", chapter 1
- Chapter (5) Water institutions and legislations in Yemen
 - i. **Bahamish, A.A.** (2006) *Water rights and policies*, Analysis of the existing legal framework (pg. 15-32)
- Chapter (6) The translation of water law into policies
 - i. **Bahamish, A.A.**; PPT on the program for Sustainable Groundwater Management in Yemen
 - ii. **MetaMeta-communications**; Groundwater Management Tool Kit
- Reflection and Discussion Assignment for the complete course
 - i. **Robbins, P.T.** (2007) *The reflexive engineer: perceptions of integrated developments*
 - ii. **Long, N and Van der Ploeg, J.D.** (1989) *Demythologizing Planned Intervention: An Actor Perspective*

Overview of the sessions

Need to be drafted by Mr. Bahamish

Chapter (4) The principles of Yemen's water laws

4.1 Introduction

This chapter provides some background information on water laws and their principles. The Water Law No (33) of Yemen and the Civil Code No (14), will be studied in specific.

Water laws are basically property laws. These laws deal with ownership and use. They are based on certain principles. Principles which are decisive on who are the owners of the various water resources and who have the right to use them. Moreover, these principles determine the conditions for use. An example of a principle could be that 'water might be used as long as enough is available for downstream users', or 'water should be treated when it is polluted by utilization'. To understand the property laws, it is of importance to be familiar with concepts like ownership, property, *bundles of rights*, legal pluralism and property regimes.

This chapter will first explain the difference between ownership, property and access. Furthermore, it will discuss the concept of legal pluralism and *bundles of rights* and it will outline the four basic property regimes. Finally, it will present the different principles which are of importance to the Yemen Water Law.

4.2 Concepts related to water property laws

Water property laws deal with *who* owns a water source, *who* might use the source and *who* might control its use. This implies that every water source relates to a human actor. This might be an individual, a village community, a governmental body, a company or another actor (see the section on property regimes).

The ownership of a water source does however not have to coincide with the right to use it or with the ability to control its use. For this reason, ownership should not be perceived as equal to 'property' or 'access'.

Ownership is a legal claim upon a valuable good or resource by the means of an existing law, institution or informal convention. This could for example be a formal permit obtained from the Natural Water Resource Authority (NWRA), but it could also be an informal mutual agreement between a village inhabitant and a chief.

Ownership is however not equal to user rights. **Property** concerns the organization and legitimacy of rights (and obligations), which are established by law, custom or convention. (von Benda-Beckmann *et al.*, eds.) Property relationships describe hence who has "the right to benefit" from a resource, in a specific context of social values and norms. Property rights are thus a function of what the property holder can enforce and what others are willing to acknowledge. Or to put it differently: property is as strong as its bearer.

The concept *bundles of rights* is used to explain that property not merely includes the right of use, but also rights concerning control and exclusion, and responsibilities and obligations. It can be compared to a bundle of sticks where each stick represents a right or stream of benefits. A landowner could for example have the following sticks: the right to use his land for farming and to benefit from its harvest, with the responsibility to avoid air and water quality pollution and to preserve animal species; the right to lease his land to other farmers, but with the obligation to pay taxes.

In general there are four different streams to benefit from a resource, the so-called **property regimes** (Rogers and Hall, 2003):

- *Open Access*

Open access is a regime where no defined group of users or owners is identified and the benefits are available to anyone. Individuals have a privilege (the ability to act without regard to the interests of others) but no right (the incapacity to affect the actions of others) with respect to usage and maintenance of the asset.

- *Common/ Public Property*

A management group has been defined and this group has a right to exclude non-members and to define the rules of appropriation. Non-members have a duty to abide by the rules. Individual members of the management group have both rights and duties with respect to usage and maintenance of the property and thus hold rights to manage the resource.

- * *Private Property*

Individuals own the resource and have the right to exclude others and transfer rights. They have a duty to refrain from socially unacceptable uses (e.g. not overexploiting a well). Others (non-owners) have a duty to respect decisions by the owners and expect that only socially acceptable uses will occur.

- *State Property*

Water is vested in the State – acting for citizens – individuals have a duty to observe use and access rules determined by the controlling agency of the State.

Of course, there are various mixed forms of these four general ones.

Property relations do nevertheless not explain who has “the ability to benefit” from a resource. An individual having a legal claim might have **access** and is able to benefit from the resource, but others may also have access through structural and relational mechanisms, like the ability of a person to access technology, capital, markets, labor, knowledge, authority, identity and social relations. (Ribot and Peluso, 2003) Going back to the example of the lake: you may have the right to swim in the lake, but you still need to get there and you probably need a swimming suit, so you need the knowledge about the route or you should ask (social relation); you need to have a transport means (technology), you could bike (labor) or you could pay a taxi (capital); there should be a bathing suit available in the shop (market) or you might borrow one from a friend (social relation), etc... You thus need other attributes and mechanism to actually access a water source. And even if you are not allowed to swim in the lake, you could though still get access, by illegal means, for example by giving the patrolling policemen a bribe.

To summarize, mapping ownership can provide tentative ideas on how property and access relationships are functioning, but a genuine evaluation of property and access

relations includes more than just legal claims made on paper or by an informal conversation.

The evaluation of ownership and property is further complicated by overlapping legal systems, or so-called **legal pluralism**. This implies that seldom just one law system is present. Next to a national law, often customary laws, conventions and informal agreements also exist. Unfortunately, they habitually do not coincide; their principles often conflict. This can be problematic, when stakeholders cannot agree upon which law system should be followed. Many indigenous communities worldwide struggle to get their law system legitimized by the state. Their ancient conventions are neglected and they are forced to obey the relatively new drafted laws of the state. Of course, this causes resistance from these communities, since they invested a lot in the past to gain these rights and are not willing to let them go. For example, the indigenous communities in the Andes (Bolivia, Ecuador) have the convention that you can obtain water rights by providing labor in the construction process of the necessary canals. The state however claims that water rights can be obtained by market concessions (Boelens R. and Hoogendam P., 2002).

Further reading

Soft copies can be provided by the teacher:

- **Von Brenda-Beckmann F. van K. and Wiber M.** (eds) *The Properties of Property*. In: Changing properties of property, (pp 1-39). New York/Oxford: Berghahn
- **Ribot, J.C. and Peluso, N.L.** (2003) *A Theory of Access*. Rural Sociology, Vol. 68, No.2 (pp. 153-181)

Available in WEC Library:

- **Von Benda-Beckmann, Von Benda-Beckmann and Spiertz** (1998), Equity and Legal Pluralism: Taking Customary Law into Account in Natural Resource Policies. In: **Boelens and Dávila (eds.)** *Searching for Equity*. Assen: Van Gorcum, pp. 57-69
- **Boelens R. and Hoogendam P.** (eds.) (2002), *Water Rights and Empowerment*. Assen: Van Gorcum. **Chapter 1** (*Water Rights and Collective Action in Community Irrigation*) and **Chapter 6** (*Water Rights and Watersheds. Managing Multiple Water Uses and Strengthening Stakeholder Platforms*).

4.3 Principles for water laws

Laws are based upon principles. Every country, council, community or tribe gives its own priorities to these principles (legal pluralism). For the sake of convenience, we discuss the national Water Law (No 33) of Yemen, issued in 2002, and the Civil Code No (14).

National water laws, like the one of Yemen, are based on a combination of former inherited law systems (e.g. customary laws, laws from colonial times), local value and belief systems (e.g. the Islam and the *Sharia 'ah*) and international agreed principles.

The local value and belief systems: Islamic principles

In the first place, the traditional and customary laws systems are important determinants for the Yemen Water Law and the Civil Code. In these customary systems the Islam and the *Sharia'ah* play an essential role.

Islamic principles in relation to water:

- **Water is Mudah:** water is of nobody; it is a gift from *Allah*. Therefore, water is considered as a social good and everybody has the right to benefit from it (beneficiary right).
- **Protection & conservation:** as water is the gift of *Allah*, humans, as stewards of earth's resources, are not allowed to pollute, or to carelessly waste it.
- **Equity:** as water is a vital resource, everyone has the right to a fair share. A Muslim cannot hoard excess water – rather he is obliged to allow others to benefit from it.
- **Shuna:** decisions on essential resources, including water, cannot be made without consultation.

NOTE: During a workshop in Amman (Jordan) in December 1998, the relation between the Islam and water management was discussed. The participants of the workshop hoped that this would help government to create laws and policies which reflect local values and not the ones of (Western) donors. In the background literature, you find a section copied from the book on this workshop:

Islam and Water Management

Chapter 1: "Islam and water management: overview and principles"

Naser I. Faruqi

International agreed principles

In relation to water management, the international agreed Dublin principles are frequently considered by governments for policy making and law adjustments, the same counts for the Yemen government. The Dublin principles were drafted during the International Conference on Water and Environment in 1992 (in Dublin, Ireland) and revised during other international water conferences. They are presented below:

The Dublin Principles:

- I Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- II Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
- III Women play a central part in the provision, management and safeguarding of water.
- IV Water has an economic value in all its competing uses and should be recognized as an economic good.

NOTE: In the TEC background paper No. 4 of the Global Water Partnership (GWP) the Dublin principles are thoroughly explained. Consult the course reader of "Introduction to IWRM".

Principles in the Yemen Water Law and the Civil Code

Principles in the Water Law no (33) of August 2002

- **Beneficiary right:** everybody has the right to benefit from water resources
- **Equity:** everybody has the right to a fair share of water.
- **Sustainability:** water should be used in such a way that its capacity can be maintained for further generations (e.g. groundwater recharge).
- **Safety:** protection against flooding or pollution should be provided as much as possible.
- **Recognition of traditional rights and customs:** existing and acquired rights before the publication of the water law shall be maintained .
- **No conflict with public interest:** water use (e.g. spate irrigation) might never harm others properties or withdraw them from their beneficiary right .
- **Compensation:** the loss of a particular right (also traditional ones and customs) needs to be compensated.
- **Registration duty:** traditional rights and customs are only acknowledged by the governmental authority, when they are registered.
- **Permit obligation for construction:** persons who want to drill a well or construct a structure for spate irrigation need to get a license from the governmental authority.

Principles in the Civil Code no (14) of April 2002

- **Sharia'ah:** water use must never conflict with the rules in the Sharia'ah
- **Prior appropriation:** water is entitled to the person it reaches first.
- **Appurtenance to land:** a water right for irrigation is coupled with a land right. The water right can be inherited, but never be sold, rented or donated separately from the land.
- **Servitude right:** the obligation to serve or to let another benefit
- **Water-way right:** the right of a landowner to let his irrigation water pass over the land of others.
- **Compensation:** to let water pass over somebody else's land can not be done without compensation, also damages occurring from the water transport need to be compensated for.
- **Drainage right:** the right to drain excess water or wastewater from a land, a house or a factory into public drains or surface water channels/buried pipes. It is not allowed to obstruct drainage flows, however, upstream users are not permitted to construct dams to protect lowlanders.

Principles of Law no (4) concerning Local Authority of February 2000

- **Participation:** the concerned governmental agency shall undertake his functions in cooperation with the local authority and all water users; it should promote the establishment of co-operative societies and associations.
- **Decentralization:** tasks and responsibilities in relation to water management should be distributed to the lowest possible level.
- **Preservation & Protection:** the local authorities have the responsibility to protect water from depletion and from pollution, by supervision on the implementation of environmental policies and legislature.

Background literature Ch. 4

Bahamish, A.A. (2006) *Water Rights and Policies*, Water rights and laws in Yemen (pg. 1-15, 33-34)

Faruqui, N.I. (1998) *Chapter 1: "Islam and water management: overview and principles"* From workshop proceedings on Water Management and Islam

Assignment Ch. 4

12 hour (4 hours reading, 6 hours answering questions, discussion and presentations)

Read this chapter carefully, study the background literature on the workshop on “Islam and Water management” (1998), chapter 1 written by Dr. N.I. Faruqi and the document “Water rights and policies” (11/4/2006) written by Dr. Awadh. A. Bahamish (pg. 1-15). Then try to answer to following questions (for yourself or with a partner):

Ownership

- 1a. Who is the rightful owner of water, according to the Islam?
- 1b. Who is the rightful owner of water, according to the Yemen Water Law no (33) of 2002?
- 1c. Who is the rightful owner of water, according to the Civil Code no (14) of 2002?
- 1c. What is the difference between those three sources?

Property regimes

- 2a. Which property regime is advocated by the Islam, according to the workshop?
- 2b. How would you describe the property regime in the Civil Code no (14) of 2002?
- 2b. How would you describe the property regime for surface water in the Yemen Water Law no (33) of 2002? And for groundwater?
- 2c. Do you observe similarities or differences between the workshop proceedings and the Yemen Water Law?

Access

- 3a. Do the Yemen Water Law no (33) or the Civil Code no (14) state anything about access?
- 3b. If yes, what exactly? If no, why do you think this is the case?

Legal pluralism

- 4a. Are you familiar with other law systems in Yemen, for example customary law systems or traditional law systems? How do these water laws differ from the Yemen water law? Try to come up with examples.
- 4b. Which traditional rights and customs are acknowledge in Yemen’s Water Law of 2002?
- 4c. Under which conditions are they acknowledged?

Islamic and Dublin principles

- 5a. Look at the Dublin principles on water management. Do you recognize similarities with the Islamic principles for water management presented during the workshop?
- 5b. Look again at the Dublin principles one by one, do you see them back in the Yemen Water Law no (33) of 2002?
- 5c. Do they come back in the Civil Code no (14) of 2002?
- 5d. Do they come back in Local Authority Law no (4) of 2000?

- 5e. Answer questions 5b, 5c and 5d in relation to the Islamic principles for water management.

Principles in the Yemen Water Law and the Civil Code

- 6a. Look at the principles of the Yemen Water Law no (33) of 2002 mentioned in section 4.3 and take the Articles of the Water Law. Indicate for each principle to which Article number(s) it belongs.
- 6b. Study the principles of the Civil Code no (14) of 2002 outlined in section 4.3 and observe the Articles of the Civil Code. Indicate for each principle to which Article number(s) it belongs.
- 6c. Do you observe conflicting principles between the Water Law no (33) and the Civil Code no (14)? If yes, which and how do you explain them?

Discuss in a small group the answers you gave to the questions 1 to 6. Then try to discuss together the questions 7 to 9. Work together and make a small presentation about your answers to these questions. Try to include also some insights you gained from questions 1 to 6.

Group discussion questions:

7. Do you agree with the interpretation of the Islam in relation to water management, presented by the workshop proceedings?
8. Are you familiar with another culture and its belief system? If yes, what do you think are their basic principles for water management?
9. Do you think international principles for water management, like the Dublin principles, are important, even if cultures throughout the world have different principles to base their water management upon?

Chapter (5) *Yemen's water institutions and legislations*

5.1 Introduction

This chapter deals with Yemen's institutions and legislations in relation to water management. Firstly, it gives an overview of the contemporary history of water institutions and legislations in Yemen. Secondly, it outlines the current most important institutions in Yemen responsible for water management. The focus lies within in the context of Yemen. Yemen is depending for its water management upon other countries and international regulations, however, those are beyond the scope of this chapter.

5.2 Contemporary history of Yemen's institutions and legislations

Water management institutions and laws have already been present for ages in Yemen. The only difference between the past and the present, is that in the past water management was solely organized by informal convections, traditional right systems and customary laws, enforced by local decision-making bodies, while in the last decades water management has been officially formalized at the national level, by the means of the establishment of special water agencies and a water law. How this has evolved is illustrated below.

After the proclamation of the Yemen Arab Republic (YAR, the former North Yemen) in 1962, a modern government was established and the country gave up its isolated position. In 1967, the People's Democratic Republic of Yemen (PDRY, the former South Yemen) was proclaimed, after it withdrew from the British Commonwealth. The two young republics had diverging philosophies on their own social and economic systems. In the Yemen Arab Republic a rather open and market-oriented, system was followed, while in the People's Democratic Republic of Yemen a Marxist central planning system was adopted. The two countries merged in 1990. In May 1991 a new constitution was approved in a referendum.

In 1991, a newly formed Ministry of Agriculture and Water Resources (MAWR) was made responsible for the planning, development, management and control of the water resources. The assignment of all these responsibilities to one ministry met against strong opposition and split the water sector into two camps. Because the MAWR represents and serves the irrigated agriculture sector, which is the largest water user in the country, some were unhappy about making it responsible for the management of all the water resources. However, MAWR was supported by the World Bank (Land and Water Conservation Project). In April 1991 a draft Water and Irrigation Law proposed by the MAWR was submitted.

In 1992 the MAWR, with support of the FAO, initiated the development of an appropriate institutional and policy framework to enable the government to undertake

an integrated, comprehensive and sustainable approach to water resources management. An interdisciplinary team of Yemeni specialists were assigned to participate in the process. The exercise resulted in the presentation of a National Water Policy Document in December 1993. The National Water Policy Group advised that the planning and regulatory functions be organized separately from the water users. The MAWR openly discussed various options and acknowledged that it should not necessarily be vested with the planning and regulatory functions. The consensus created resulted in the establishment of the National Water Resources Authority (NWRA) in October 1995.

In 1997, a policy to reform the urban water supply and sanitation sector was submitted. The objective was to privatize the urban water supply sector and to introduce tariff reforms. Local Corporations for Water Supply and Sanitation (LCWSS) were introduced from that moment onwards.

Slowly, the intended integrated and sustainable approach towards water management was further developed by the government, through the establishment of tangible Water Resources Policy and Strategy in 1999 and 2000 respectively. This Water Resources Policy was, after assessments, further drafted towards more concrete policies for the different sub-sectors: the Watershed Policy and the Agricultural Sector Reform Policy were issued in 2000, and the Irrigation Water Policy in 2001.

In 2000, the Local Authorities Law (see Bahamish, 2006, pg. 12-15) was approved by the Parliament, which aimed to increase community participation and decentralization of administrative and financial processes, including those related to water management. Branches of Ministries and National Authorities became 'local organs' under the governorate. The local councils and their staff were treated as personnel of the governorate. In relation to water management, they received the responsibility of supervising the implementation of water policies and protecting water resources from overuse and pollution.

In 2002, a new national Water Law (see Bahamish, 2006, pg. 5-8) was approved by the Parliament, focusing on water resources management. It provided a framework to preserve water resources that are essential for the sustainability of water services. The law did not cover principles for drinking water supply and sanitation infrastructure as yet.

In 2003, the Ministry of Water and Environment (MWE) was created, a sign of political commitment to tackle the challenges Yemen faced in the water sector. The agencies related to water resources management, environmental law and urban water supply, which first belonged to different ministries, became a part of this ministry to enhance coordination.

In 2004, the authorities for rural drinking water supply and sanitation and the corporations for city water supply and sewerage also became part of the MWE. In August 2004 the MWE received a Regulatory Ordinance by a Republican Decree, which outlined the tasks of ministry (tasks are outlined by Bahamish, 2006, pg. 16-17).

In 2005, the Government of Yemen approved the National Water Sector Strategy and Investment Plan (NWSSIP), a visionary and modern water resources management and MDG oriented development strategy, that proposed a set of institutional, financial and regulatory measures, which aimed at addressing issues in 5 sub-sectors: Urban Water Supply and Sanitation, Rural Water Supply and Sanitation, Water Resources Management, Irrigation and Watershed Management and Environmental Protection. The strategy was developed under the leadership of the MWE and covers the period of 2005-2009. It requires an investment of US\$ 300 million per year. The main implementing agencies for the strategies and action plans are: the National Water Resources Authority (NWRA), the General Authority for Rural Water Supply Projects (GARWSP), the National Water and Sewerage Authority (NWSA), the Local Corporations for Water Supply and Sanitation (LCWSS), the General Department for Irrigation (GDI) of the Ministry of Agriculture and Irrigation (MAI), and the Environmental Protection Authority (EPA).

The latest development is the addition of amendments to the Water Law no (33) of 2002 (see Bahamish, 2006, pg. 21-27). The amendments were submitted by the Cabinet in 2006. They were deemed necessary as the responsibilities of NWRA lied within the MWE instead of the MAI, and the supervision on rural water supply was transferred to the MWE. The amendments contain more stipulated legislations on Wadi management, transfers of water rights, groundwater mining, public participation, and use of rain and spate water. The ultimate aim of these is that the government will have a greater capacity to stop groundwater mining and water pollution, and can ensure water for domestic purposes.

5.3 Overview water management institutions in Yemen

Water management in Yemen is arranged at different levels, from national up to the local sphere. Since the parliament approved the decentralization (the transfer of responsibilities to the lowest possible level), the local authorities received more responsibilities and now have the task to promote the establishment of co-operatives, ground water management committees and water user associations to take up tasks which were previously devoted to higher levels of management. Water Basin and Water Zone committees are gradually being formed to arrange water management on the intermediate level. At the national level, the established MWE (2003) and the reformed MAI (1995) are responsible for coordination of water management activities and enforcement of water laws through its various agencies. The following paragraphs explain the tasks of the different institutions which are engaged in water management in Yemen.

National level

Two most important ministries in water management

Ministry of Water & Environment (MWE)

The MWE is a recently (2003) established Ministry, which aims to integrate different water management activities in order to reach sustainability. It therefore took over tasks from various other Ministries, except the task of irrigation management. The

MWE coordinates the programs of in total five different authorities. These included, since 2003, the National Water Resources Authority (NWRA), the Environmental Protection Authority (EPA), the National Water and Sewerage Authority (NWSA) and since 2004 additionally the *Local Corporations for Water Supply and Sanitation (LCWSS)* and the *Rural Water and Sewerage Authority (RWSA)*.

National Water Resources Authority (NWRA)

The National Water Resources Authority (NWRA) is in charge of 1) water resource planning and monitoring, 2) legislation and 3) public awareness. In relation to point 1, it has the responsibility to formulate a National Water Plan, which is after its approval binding for everyone. This national plan is further developed by the NWRA into water basin and water zone plans, which integrate all water management issues, both quantitative and qualitative, within a basin or zone into one plan. In relation to point 2, it is responsible for the registrations of water rights and the licensing of water wells. The staff of the NWRA has the status of judicial enforcement officers and report violations of the Water Law to the police. In relation to point 3, it ought to make the public aware of groundwater mining and water pollution (<http://www.nwra-yemen.org>).

Environment Protection Authority (EPA)

Environment Protection Authority (EPA) is responsible for the issues related to applying the Environment Protection Law of 1995. This Law is stipulated by an Environmental Impact Assessment (EIA) for projects which are by their nature a source of environmental pollution (Environment Protection Law, Article 36). EPA is responsible for observing and measuring the pollution of the natural resources in the country.

National Water and Sewerage Authority (NWSA)

The NWSA is responsible for the planning of water supply and sanitation in the cities of Yemen and for keeping track of the performance of the LCWSS.

Local Corporations for Water Supply and Sanitation (LCWSS)

The LCWSS are responsible for the implementation, constructing and operation of water supply and sewerage systems. In the past, there used to be one national corporation, this one has been decentralized to various local corporations in the major cities.

Rural Water and Sewerage Authority (RWSA)

The RWSA is responsible for the planning of water supply and sanitation in the rural area of Yemen and for keeping track of the performance of the local councils in implementing water supply and sanitation.

Ministry of Agriculture & Irrigation (MAI)

Until 1996, the Ministry of MAI (at that time called Ministry of Agriculture and Water Resources) was responsible for the water resources planning & development. In 1995, water resources planning & development was transferred to NWRA, and the MAI was restructured to be solely in charge of irrigation activities, planning,

development, and implementation and monitoring. The fundamental policy of the MAI is: to increase farmers' income and contribute in reducing poverty, whilst cutting the over-abstraction of groundwater. The selected road for this process is the Agenda 21 Dublin principles, in which the water sector is reformed to promote efficiency, decentralisation, cost recovery and participation. The strategy for this is the establishment of Water Users' Associations (WUAs).

The MAI has 8 directorates (e.g. *General Directorate of Irrigation (GDI)*) and is responsible for providing the technical guidance and extension services for the farmers, as well as constructing the irrigation structures (small dams, canals, water tanks, diversion works). The MAI is functioning through its offices in the all Governorates. In addition, it supervises specialized authorities in the fields of agricultural research, agricultural and regional development authorities (RDAs), cooperatives, companies, and projects (<http://www.mai-yemen.org>).

Two other ministries which have minor task in relation to water management

Ministry of public works & urban Planning (MPWUP)

The ministry is responsible for observing and monitoring the drinking water purification stations.

Ministry of Local Administration (MLA)

MLA is responsible for enforcing the Local Authorities Law of 2000 (see chapter 4), aimed at increasing community participation and decentralization of administrative and financial processes, including those related to water management.

Intermediate level

Water Basin and Water Zone Committees

The Water Basin and Water Zone Committees were established under the responsibility of the NWRA. They are responsible for the execution of the Water Basin and Water Zone Plans, drafted by the NWRA. The NWRA supervises whether the work of the committees is according to the legislations of the Water Law. The committees themselves can have various sub-committees, for example a groundwater management council or a drinking water supply council, which can decide on, and coordinate implementation of their specific task.

Governorate Local Councils (GLCs)

Since the Local Authority Law of 2000, the Governorate Local Councils have gotten far more tasks in relation to water management (see Bahamish, 2006, pg. 19). They should supervise over and control the implementation of water policy, and protect water basins against exploitation and pollution. They should also stimulate the formation of co-operatives, like groundwater management committees, and furnish them with facilities and supervise their activities. It is also mandatory for the GLCs to manage and control the water resources in coordination and cooperation with the water resources authority. The GLCs additionally supervise the work of their local district councils.

District Local Councils (DLCs)

The DLCs have the task to promote sustainable water resource management among their population. They have to do this through promoting the establishment of cooperative societies and associations, like WUAs, and providing them with facilities and supervising their programs. Additionally, they should adopt the necessary measures to ensure preservation of the environment, carry out awareness campaigns among farmers to save water, grant licenses for drilling artesian wells after approval of the NWRA, and guarantee drink water supply and sanitation. (see Bahamish, 2006, pg. 19-20)

Local level

The Local Authority Law of 2000 obliges the GLCs and DLCs to promote the formation of cooperatives and associations among the local population, for example agricultural cooperatives and water users' associations.

Agricultural Cooperative Union (ACU)

The ACU is an NGO, which re-unites the Agricultural Cooperative Societies in Yemen. The agricultural societies are independent production cooperatives with the main objective to raise the levels of livelihoods of its members by generating income.

Water User Groups (WUGs) and Water Users' Associations (WUAs)

In relation to water management the formation of WUGs is stimulated at micro level. These groups are habitually responsible for operation and maintenance of water management infrastructure. Several WUGs can be combined to form a WUA, which can regulate and coordinate O&M at a higher local level.

Background literature Ch. 5

Bahamish, A.A. (2006) *Water Rights and Policies*, Analysis of the existing legal framework (pg. 15-32)

Assignment Ch. 5

6 hours (2 hours reading, 4 hours answering questions + presentations)

After reading chapter 5 and the background literature (*Water Rights and Policies, Analysis of the existing legal framework* (pg. 15-32)), try to answer the following questions in small groups.

Institutional change

- 1a. How would you describe the main institutional change in Yemen concerning water management?
- 1b. Why is this change promoted?
- 1c. Which Law is in this sense very influential?
- 1d. Can you mention examples of currently established local decision-making bodies, like cooperatives or WUAs, in your own working domain? Do they receive support from the governorate and district councils? What do you think of their responsibilities and performances?

Law amendments

- 2a. Where fore do you think amendments to the Yemen Water Law of 2002 are deemed necessary?
- 2b. Try to summarize in a few keywords for each Article the content of these amendments.
- 2c. How would you describe the Water Law with amendments compared to the Water Law without amendments?
- 2d. Do you think the amendments are sufficient, or do you think others are required? If yes, which?

Civil Code vs. Water Law

- 3a. What is the role of the Civil Code in relation to the Water Law?
- 3b. Which legislation(s) that are part of the Civil Code are taken over by the Water Law?

Highest Priority

- 4a. Which water use has the highest priority in the Water Law? What is the position of water for agricultural purposes?
- 4b. Why do you think this the case?

Presentations

Make a group presentation of approximately 15 minutes about your experiences with water institutions in Yemen. Maybe you have worked for an institution yourself, or you were involved in the establishment of WUAs and can tell something about its activities. Try to focus upon their role in relation to Water Law legislations (e.g. policy-making, supervision, enforcement, implementation). If you did not work for the water sector, then tell a general story about the institution you worked for and how it dealt with governmental regulations. At the end of every presentation, 15 minutes are reserved for questions.

Chapter (6) *The translation of the water law into policies*

6.1 Introduction

In the previous chapters, water policies, policy instruments, policy evaluation tools, the water law in Yemen and its principles, and an overview of the contemporary history of institutions and legislations in Yemen were discussed. The question remains how Yemen translates principles into practice or to put it differently: how are water laws utilized to draft policies and programs. With help of the program for Sustainable Groundwater Management in Yemen (SGMY) of the NWSSIP this will be explained. This program aims to halt ground water mining in Yemen by enforcing a licensing system, creating incentives for water saving technologies and by promoting the establishment of WUAs.

6.2 The principles that guide the program for SGMY

The Yemen Water Law is based upon several principles, as explained in chapter 4. These need to be reflected in each single plan, project and program to become effective in practice. The NWSSIP has adopted the following principles, which count for the program of SGMY.

The “ecological” principle: *Dublin principle I*

- promote an integrated/holistic approach (including environment & wastewater reuse)
- a comprehensive, inter-sectoral, inter-generational view
- promote sustainable agricultural practices

The “institutional” principle: *Dublin principle II + III*

- stakeholder participation (a basin approach that responds to users)
- decentralization (accountability of Urban WSS Services to users)
- greater role for private sector, NGOs and women

The “instrument” principle: *Dublin principle IV*

- greater investment
- greater attention to economic value of alternative uses
- greater use of economic instruments (water rights, user charges...)

As you can observe, the principles of NWSSIP connect to the Dublin principles, which on their turn are reflected in the Yemen Water Law no (33).

6.3 The specific legislations which are important for the SGMY

The Groundwater Management Project had to take into account the following legislations of the Water Law, the Civil Code and the Local Authority Law, which relate as you can see to the above mentioned principles:

The “ecological” principle:

The following legislations are supported in the Water Law:

- Establish a permit system for exploration and abstraction (to keep track of abstractions, to secure and protect the water rights, to regulate access to the resource,..)
- (Regulate drilling (by the means of licenses) for the benefit of resource protection
- To provide for enforcement
- To enable/regulate artificial recharge
- For pollution control
- To promote water use efficiency (through) allocation priorities, incentives...)
- Establish protected areas around groundwater well-fields/certain aquifers
- Set fines and penalties for violations which cause damage to the resources

The “institutional” principle

The following legislations are supported in the Local Authority Law:

- To introduce planning procedures and coordination mechanisms
- To set institutional arrangement for planning and management, and to assign responsibilities (leading planning institution, guiding principles such as demand management, public participation,...)

6.4 The concrete interventions of the program of SGMY

With help of the principles of the NWSSIP and by following the national legislations, the program for SGMY developed its own interventions.

As mentioned in chapter 1, programs can make use of three different policy instruments:

- 1) Legislation and enforcement mechanisms
- 2) Market-mechanisms
- 3) Engaging the public

The program of WGMY aims to undertake the following interventions:

- 1) Groundwater legislation and enforcement mechanisms
 - a. Enforcement of a licensing system for drilling contractors (DCs)
 - b. Enforcement of a well permits system (WPS)
- 2) Use of economic incentives and cost-sharing measures
 - a. Introduction and expansion of piped water delivery and localized irrigation system on a cost-sharing mechanism
 - b. Reduction of diesel fuel subsidy
- 3) Stakeholder participation and capacity-building
 - a. Establishing Water Users Associations (in Sana'a Basin: water user groups were established for each well)
 - b. Supporting community-groups for local water management (informal WUGs, local council, etc.)
 - c. Information sharing on water use and aquifer conditions

- d. Establishing Water Basin Committees (Sana'a, Taiz, Sa'adah)
- e. Enhancing support for users through research and extension services (use of "clay pot" for irrigation for selected crops at national level, etc.)

Background information Ch. 6:

Bahamish, A.A.; Ppt on the the Sustainable Groundwater Management Program of NWSSIP

MetaMeta-communications; Toolkit for Groundwater Management,

Final Reflection and Discussion Assignment

8 hours (4 hours reading, 4 hours discussion + presentation)

The aim of this assignment is to let you critically think about policy-making and interventions, and about your role as future water manager in these activities. Read the articles of Robbins and Long & Van der Ploeg. Discuss the following questions in a group and make a small presentation about it.

1. What are the characteristics of a traditional engineer and what are those of a reflective engineer?
2. What kind of policy instruments do you think a traditional engineer prefers? And a reflective engineer?
3. Do the Dublin principles fit to a traditional engineer or a reflective one?
4. According to Long & Van der Ploeg, how are interventions often perceived?
5. Does this match with a traditional or reflective engineer?
6. How should interventions be perceived according to Long & Van der Ploeg?
7. Does this match with a traditional or reflective engineer?
8. Do you think traditional or reflective engineer are working in Yemen's governmental water agencies?
9. Would you call yourself a traditional or reflective engineer?

Background literature

Robbins, P.T. (2007) *The reflexive engineer: perceptions of integrated developments*

Long, N and Van der Ploeg, J.D. (1989) *Demythologizing Planned Intervention: An Actor Perspective*

Answer sheet to questions Chapter 4

- 1a. Water is nobody's property; it is a gift from *Allah*. So everybody is entitled to use it.
- 1b. Water is public property, under supervision of the state.
- 1c. Water is nobody's property, it is gift from *Allah*, which is interpreted by the Civil Code as the entitlement of the whole community, unless it is resembled in a field or container which is privately owned.
- 1d. While the Islam and the Civil Code state the water is a common good, the Water Law of 2002 explicitly states that water is ultimate state property.
- 2a. Water is categorized in the Islam as follows (Sabeq 1981; Zouhaili 1992): 1) Private property (water in private containers, treatment plants, distribution systems, and reservoirs). 2) Restricted private property (lakes, streams, and springs located in private lands). The owner of the land has special rights over others, but also has certain obligations to them. 3) Common property (water in rivers, lakes, glaciers, aquifers, and seas, and from snow and rainfall).
- 2b. Water is categorized in the Civil Code as: 1) Common property, entitled to the community (lakes, stream, springs, wells, rivers, glaciers, aquifers, seas, rainfall), 2) Private property, if it is located in a privately owned location (wells, streams and springs located in private land and rainfall falling upon this land).
- 2c. Surface water is considered in the Yemen Water Law principally as a common property, but only within certain boundaries. As the State has the highest authority it can always interfere. Private property can only be obtained under the state regulations (so through permits, land/water rights).
- 2d. The Civil Code seems to follow the principles of the Islam. While the Water Law does recognizes common and private property rules established in the Civil Code, it ultimately perceives water as a State property.
- 3a. No, they don't. The Water Law and the Civil Code deal with water rights, thus with property rights.
- 3b. Access deals with "ability to benefit from something", not with legal claims per se. Thus, although somebody might have a legal rightful claim to water, he still requires other materials and relational attributes. And vice versa, with certain means, a person can get access to water, although he does not have to have a legal claim (illegal practices).
- 4a. -
- 4b. The traditional rights that relate to spate water for irrigation, and the traditional rights to the water of natural springs and to the base flow existing prior to entry.
- 4c. Registration at NWRA, within 3 three years of the approval of the Water Law.
- 5a. Yes. The Islamic principle that water is gift from *Allah*, which should be protected and preserved, is similar to the Dublin principle I. The Islamic principle of *Shuna*, is similar to Dublin principle II.

- 5b.** The Dublin principle I, related to sustainability, comes back in Article (6) and (12) of the Water Law. Dublin II, related to participation, comes back in Article (61).
- 5c.** No, the Civil Code does not seem to have similarities with the Dublin Principles.
- 5d.** Dublin Principle II stipulates participation, which comes back in Article (19) and (61) of Local Authority Law, which stimulates the formation of public co-operative societies and associations.
- 5e.** The principle that water is *Mudah* and therefore common property is recognized by the Yemen Water Law, although the ultimate regulator concerning water is the State. The Civil Code fully acknowledges the *Mudah* principle. The need for protection and conservation comes back in Article (6) and (12) of the Water Law. The Civil Code states in Article (1360) that water taken may not exceed the appropriator's need. The principle of equity is part of Article (6) of the Yemen Water Law and is mentioned in Article (1364) of the Civil Code. The principle of *Shuna* is stipulated in Article (61) of the Yemen Water Law, consultation with concerned people is obliged in the Civil Code, and the Local Authority Law stimulates cooperation between people via cooperatives and associations.
- 6a.** **Beneficiary right:** Art. (6), (30); **Equity:** Art. (12); **Sustainability:** Art. (6), (12); **Safety:** Art. (17), (25), (61); **Recognition of traditional rights:** Art. (27), (28), (29), (45); **No conflict with public interest:** Art. (27), (30), (31), (62), (70); **Registration duty:** Art. (32), (33), (71); **Compensation:** Art. (27), (75); **Permit obligation for construction:** Art. (69).
- 6b.** **Sharia'ah:** Art. (1369), (17); **Prior appropriation:** Art. (1360); **Appurtenance to land:** Art. (1363); **Servitude right:** Art. (1366), (1378); **Water-way rights:** Art. (1366), (1369); **Drainage rights:** Art. (1372), (1374); **Compensation:** Art. (1367), (1368), (1369), (1370), (1373).
- 6c.** Yes, there are conflicting principles. The *beneficiary right* and *equity* conflict with *prior appropriation*. The persons to whom water reaches first, can take as much as necessary, according to the Civil Code. In practice, this means they will receive a greater share than the downstream users and in case of drought even more: downstream users will probably receive nothing and their beneficiary right, according to the Water Law, will not be fulfilled. Also, the principle of *safety* and the *drainage right* can conflict. According to the drainage right in the Civil Code upstream users are not permitted to protect downstream users from flooding, while it is stipulated in the Water Law that no damage might be created to others.

The Civil Code is based upon the *Sharia'ah*, which has a long feudal tradition, while the Water Law no (33) is relatively new and contains the latest, global trends in water governance which focus on water scarcity and flooding. For this reason, the Civil Code prioritizes the commonly wealthy upstream living landlords, while the Water Law embraces principles like sustainability, safety, registration duty and permit obligations.

Answer sheet to questions Chapter 5

- 1a.** The main institutional change is decentralization, which means that responsibilities are given to the lowest possible level. This implies that the responsibilities that used to be part of national and regional governmental agencies, especially concerning implementation, operation and maintenance of water resources and infrastructure are handed over to the Local Councils of the Governorates and Districts, who in their turn stimulate the formation of cooperatives and associations among people to actually execute these tasks.
- 1b.** Worldwide it is acknowledged that decisions often are made top-down, which implies that higher governmental authorities make policies and plans, and enforce low levels to execute them. It appeared that the plans often did not fit the local context and sometimes resistance among the population occurred. Therefore, it is recommended that water management policy-making, design and planning should start at the 'bottom', by local decision-making bodies and associations.
- 1c.** The Local Authority Law no (4) of 2000, which promotes decentralization.
- 1d.** -
- 2a.** They were deemed to be necessary as since 2003 the responsibility of NWRA lies within the MWE instead of the MAI, and the supervision on rural water supply is transferred to the MWE. The amendments contain more stipulated legislations on Wadi management, transfers of water rights, groundwater mining, public participation, and use of rain and spate water. These aspects were insufficiently clear in the Water Law of 2002.
- 2b.** Article (5): Wadi management; common property; traditions & customs recognized; no detrimental changes in the courses of flooding; MWE and MAI will carry out activities that benefit the Wadis.

Article (6): Beneficiary and user of water should only use water in accordance with the Water Law; not conflict public interests; not damage environment; accept state interventions against overexploitation and pollution; registration at NWRA is obliged; fines if user inflicts law.

Article (24): MAI tasks; encourage vertical agricultural expansion; limit granting of licenses for drilling wells; farmers participation; set plans on water levels; establish water structures, operation and maintenance; activity coordination with MWE; survey water rights and servitude rights.

Article (26): Manner of registration of water rights at the NWRA, compensation ordinance.

Article (27): Traditional rights on rain and spate waters do not conflict with sustainable water resources development; public interest has priority; compensation if traditional rights are lost; appurtenance of land.

Article (30): Public interest; drinking water purposes have first priority; water saving technologies are mandatory if available.

- 2c.** In the amendments the traditional rights are more restricted, to give public interest first priority, while in the Water Law of 2002, traditional rights are completely acknowledged to be almost untouchable (Article 27):

In the amendments the laws concerning protection and preservations are more outlined in detail (Article 6) and the procedure of water right registration at NWRA (Article 26).

- 2d.** This is of course your personal opinion. But shortcomings which could be mentioned could either concern groundwater use (e.g. no license obligation for water abstractions between 0 and 60m; no provision for water abstracting metering; no levy charging for irrigation water, etc..) or concern drinking water supply, sanitation & water treatment (e.g. no responsibilities for the NWSA or RWSA; no regulations concerning water quality; no regulations concerning wastewater, etc..).
- 3a.** If the Water Law can not give an answer than the Civil Code should be applied, thus the Water Law stands above the Civil Code.
- 3b.** The amendments concern now elements concerning ‘appurtenance to land’ (Article 27), which are also part of the Civil Code.
- 4a.** Water use for drinking and domestic purposes has the highest priority, followed by uses for livestock, public facilities, industrial purposes and environmental needs. The last priority is given to agriculture.
- 4b.** People cannot live without drinking water. The same counts for livestock. When yield fails because of drought, food can still be imported from other regions. The priority of industrial purposes over agricultural ones is possible because industrial purposes have a higher economic value. Environmental needs also have to be met, as particular damages are irreversible when large amounts of animal and plant species die due to drought.