

Appropriate Technology concept in the water and sanitation sector

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Reality: Introduction Video - Uganda Water Sector Programme

Theory: „AT Concept“ background and the water sector context

Reality: Life in rural areas of developing countries

Theory: Tools for implementation of “AT Concept “:
PRA, SWOT, PHAST

Technology examples

**“appropriate Technology”
is an answer ...**



... but what was the question ?

definitions, meanings... :

appropriate

appropriate:

**to be adequate, convenient
to be comfortable, welcome**

to adapt, to customize

to acquire, to acculturate

semantic origin, relevance... : appropriation

According to T.B. Strong (Political Science UCSD) it contains the Latin root '*proprius*', with the connotations not only of property, but also of proper, stable, assured and indeed of common or ordinary."

".... I have appropriated something when I have made it mine, in a manner that I feel comfortable with.....; when I do not find myself called into question by it, it has become part of my understanding and it is recognized by others as 'owned'"

in sociology it is the assimilation of concepts into a governing framework (J. Sosnoski)

definition :

technology

According to Stachowiak : [http://wwwpsy.uni-muenster.de/inst3/AEBreuer/Vorlesung/1_Dok1.pdf]

“.... technology transfers technical know how into alternatives for action, which can be implemented by technique ”

...technology is a process between people:
transfer from know how to practice

dimensions of technology

in general technology is generated by a process of 3 interrelated, dynamic system components:

- a technical–economical system with technical facilities
- a socio-political system with organisational structures
- a socio-cultural system with standards, values and visions

technological development

in general technological development is driven by

deficit – perceived and defined demand – and potential according to the 3 described dimensions

Social perception of deficit and demand depends heavily on internal dialogue & communication and time for trial and error on level of actors as well as acceptance on level of consumers (actor - consumer relationship)

Principles of appropriate technology

- sustainability
- equity
- replicability
- effectiveness & efficiency

These concepts are linked together and need to be considered as a package of issues, most importantly at sector-policy level, but also in the planning and design of activities

Definition: sustainable development

Nachhaltige Entwicklung I (LVA-Nr 375.020, VO) Univ.-Prof. Dr. Jürg Minsch

Sustainable development is a task for the entire society,
where science is contributing

system knowledge

goal knowledge

transformation knowledge

situation in development cooperation

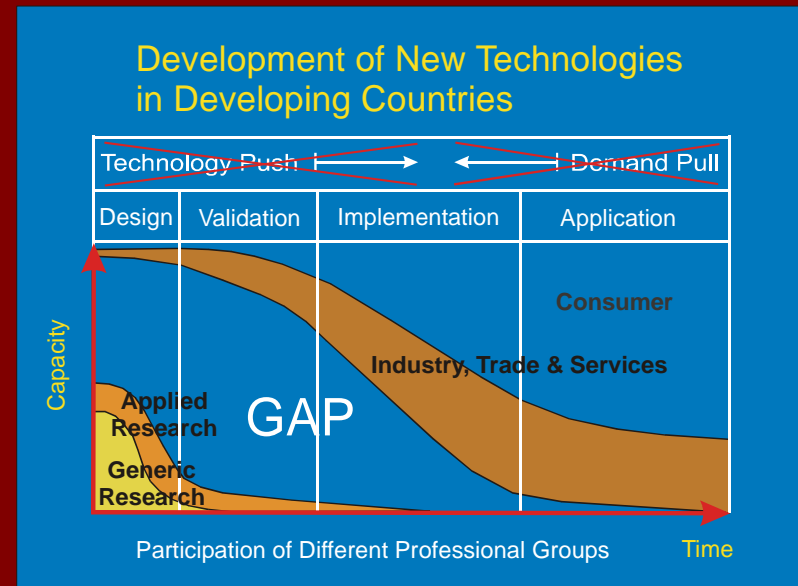
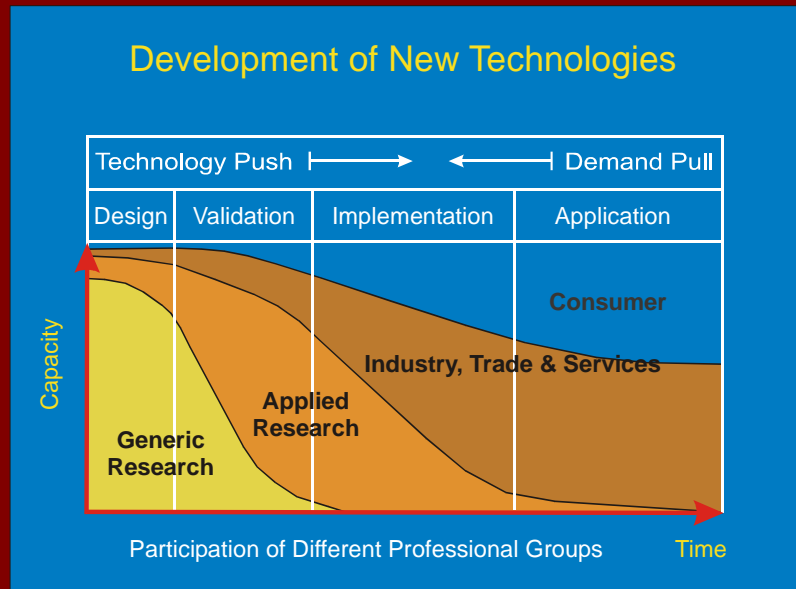
the momentum for interventions comes from outside the society and is donor driven (donor – recipient relationship)

deficit and goals are defined from outside – perception according to an other cultural and economical context

implementation speed depends on external resources and project management and external skills

usually no support from national/regional elites

Technology and applied research in development cooperation



e.g.:

PV pumping systems

corrosion control, solar desalination

rainwater harvesting management

actors networks

local development priorities

WS&S in isolated institutions

necessary additional dimensions for AT in development cooperation

time

for process orientation and
systemic approach

social dialogue and communication

for authentic perception of goals and
deficits and regional integration

experiences of Austrian development cooperation - water sector

implementation of appropriate technology concept on 3 levels

sector policy level

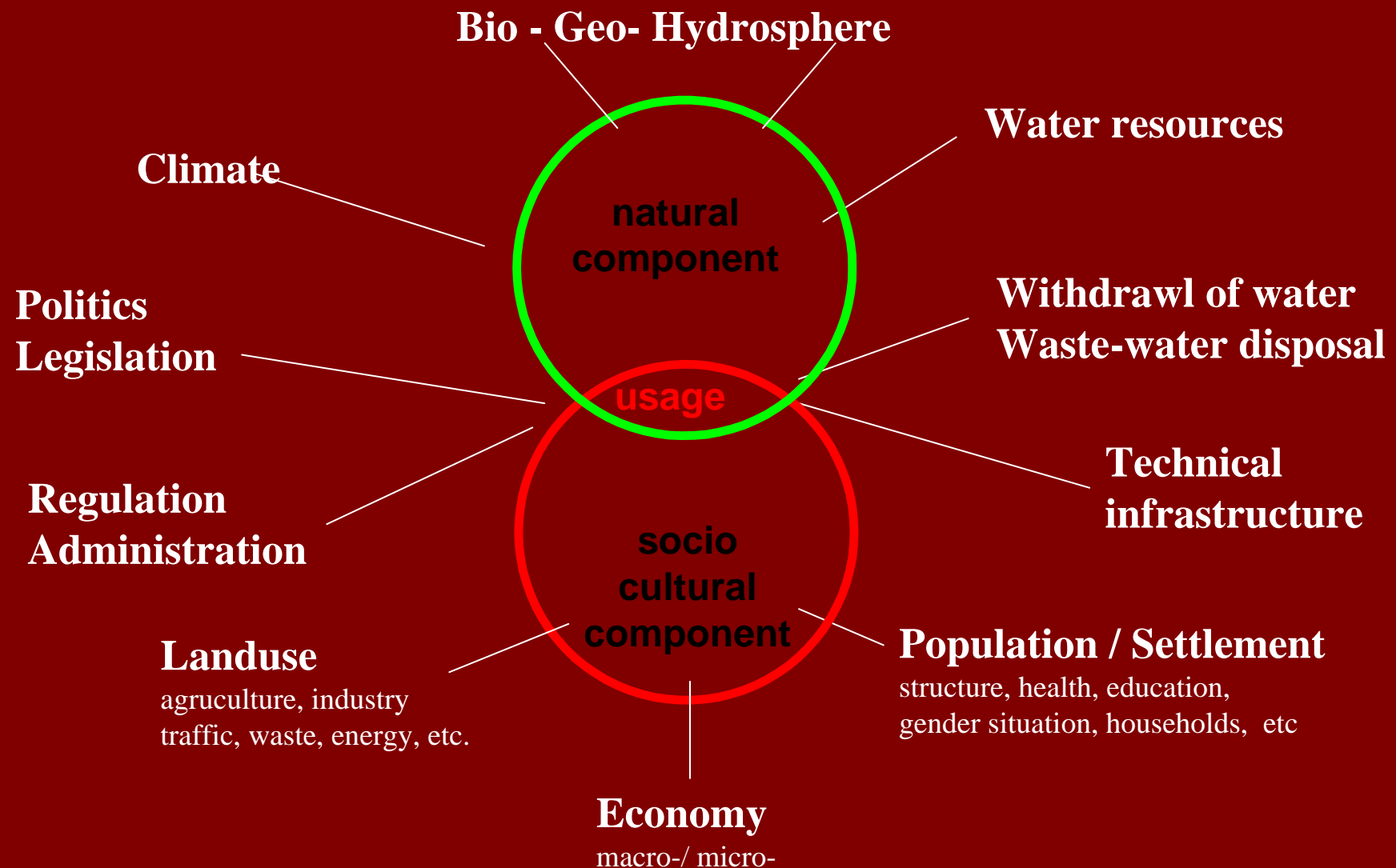
program and project level

technology level

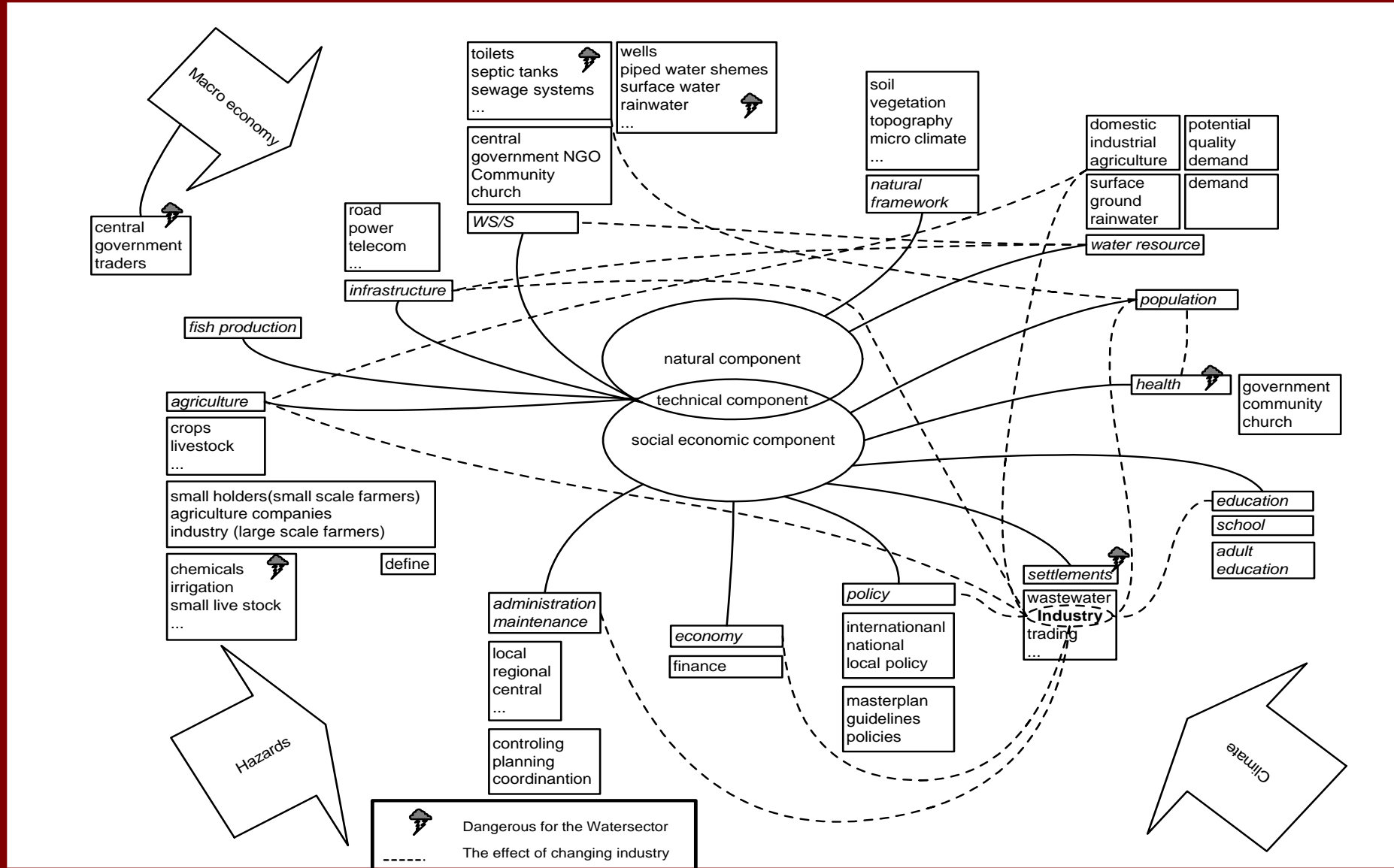
water sector policy - ADC

- **access to adequate water supply and sanitation services for all** in a regional context, including infrastructure investment and development of sustainable operation and maintenance structures
- **development of a necessary institutional environment** on all levels, national, district and local – to assure the planning of infrastructure and protection and management of water sources including productive water and other competing usages
- **development of human resources** to achieve the necessary capacity
- **development of cross section themes** like gender and environmental strategies
- **harmonisation and alignment with other donors** and partner countries

water sector- program level – a system picture



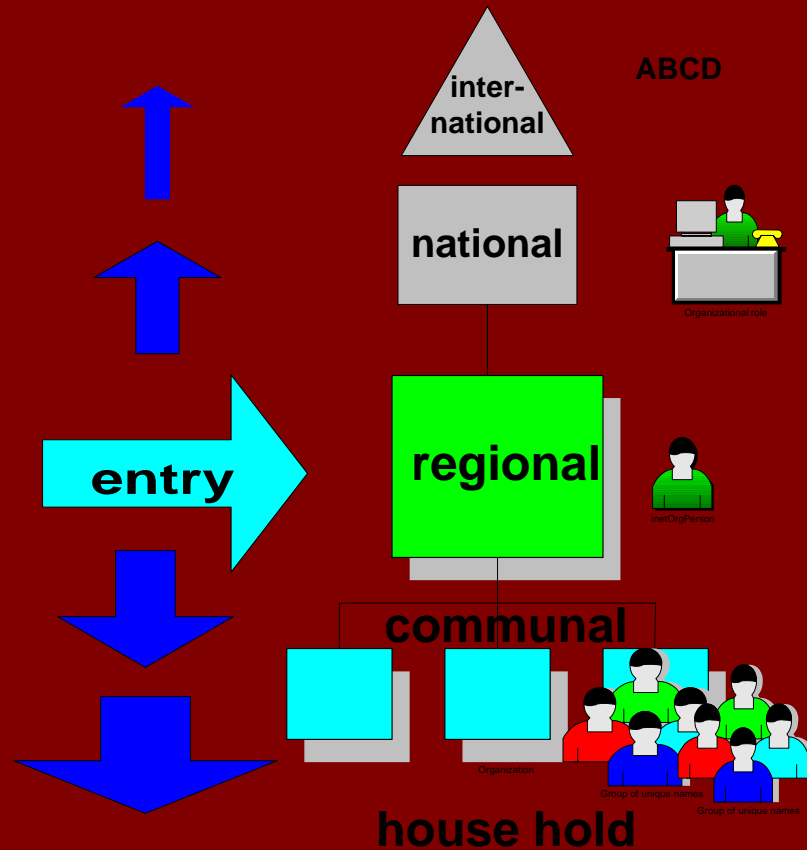
water sector- program level – a system picture



program level – sensitivity analysis

Rating																				Active Sum (AS)	Activity Ratio (AS*PS)	
		strong	2	Macro economy	Macro climate	Hazards	Population	Health	Education	Settlements	Industry	Agriculture	Economy	Administration	Policies	Infrastructure	Natural framework	Fish- production	Trade Business			0
moderate	1	WS/S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
weak	0,5	Elements / Issues	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
very weak	0,1																					
1	WS/S		0,1	0,1	0,1	2	2	1	1	1	0,5	0,5	0,1	0,1	1	2	2	0,1		14	300,6	
2	Macro economy	2		0,1	0,1	0,1	0,5	0,5	0,1	2	2	2	0,1	2	1	0,1	1	0,5		14	311,6	
3	Macro climate	0,5	0,1		2	0,5	2	0,1	0,1	0,1	2	0,1	0,1	0,1	0,5	1	1	0,1		10	227,6	
4	Hazards	2	0,1	0,1		0,5	2	0,5	0,5	1	2	2	0,5	0,5	2	1	1	1		17	369,1	
5	Population	2	0,1	0,1	0,5		0,5	0,5	2	0,1	1	1	0,5	0,5	0,5	1	1	1		12	271,8	
6	Health	0,5	0,1	0,1	0,1	2		2	0,1	1	1	2	1	0,5	0,1	0,1	0,1	1		12	258,6	
7	Education	2	0,1	0,1	0,1	0,5	2		1	0,5	2	2	1	2	0,1	1	1	2		17	384,5	
8	Settlements	2	0,1	0,1	0,5	0,1	2	1		0,1	1	2	2	1	1	2	0,5	2		17	384,5	
9	Industry	2	0,1	0,1	0,1	0,1	0,5	0,5	2		0,1	2	1	1	2	1	0,5	2		15	331,5	
10	Agriculture	2	0,1	0,1	1	0,1	0,5	0,5	2	2		2	1	1	2	2	1	2		19	426,5	
11	Economy	2	0,1	0,1	0,1	0,1	2	2	1	1	1		1	1	2	1	1	2		17	384,5	
12	Administration	1	0,1	0,1	0,1	0,1	1	0,5	0,5	1	1	0,5		0,5	0,5	0,5	1	0,5		9	196,7	
13	Policies	1	0,1	0,1	0,1	0,1	0,5	2	0,5	2	1	1	2		1	0,1	1	1		10	229,8	
14	Infrastructure	0,5	0,1	0,1	0,1	0,5	1	1	1	2	1	2	0,5	0,5		0,5	1	1		10	227,6	
15	Natural framework	2	0,1	0,5	1	0,5	0,1	0,1	1	1	2	0,1	0,1	0,1	0,5		2	0,1		9	201,1	
16	Fish- production	0,5	0,1	0,1	0,1	0,1	0,5	0,5	2	2	1	2	1	0,5	1	0,5		2		12	263,0	
17	Trade Business	0,1	0,1	0,1	0,1	0,1	0,5	0,5	2	1	1	2	0,5	0,5	1	0,5	1			11	243,1	
18		0																		0	0,0	
Passive Sum (PS)		22	1,6	2	6,1	7,4	18	13	17	18	20	23	12	12	16	14	16	18	0			
Degree of Interaction (AS/PS)		0,6	8,8	5,2	2,7	1,7	0,7	1,3	1,0	0,8	1,0	0,8	0,7	0,9	0,6	0,6	0,7	0,6				

water sector – strategy



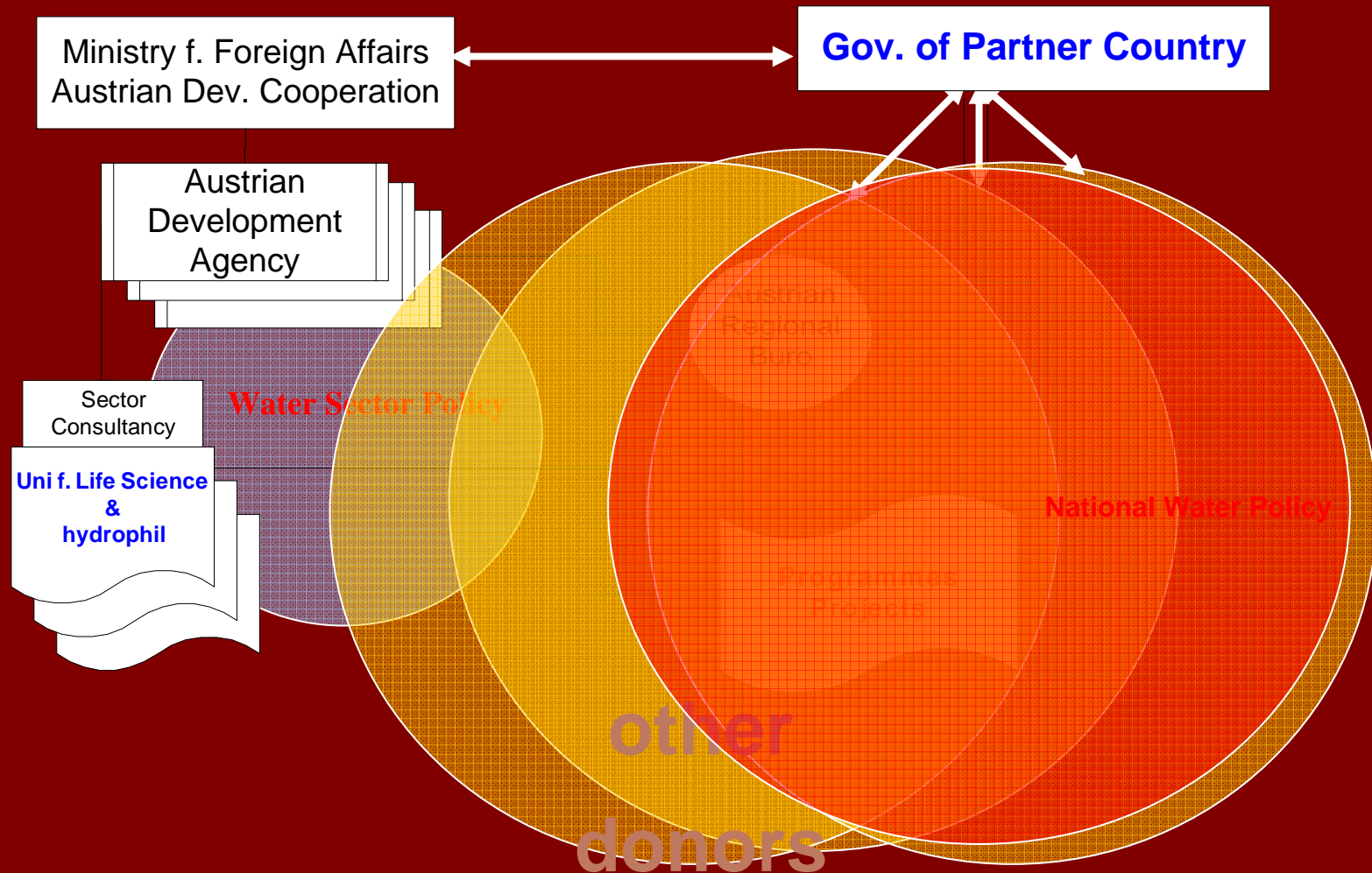
Policy Dialoge

consultancy
sector programming

consultancy
general planning
water resource
management

water user ass.
detail planning,
construction
organisation
awareness creation

Water sector in development cooperation



water sector – stakeholder involvement - I

- **Austrian Development Cooperation:**

development of an water sector policy, discussion and formulation sector programs together with national institutions in the partner countries, funding the implementation of programs in the partner countries, integration and harmonisation of the program on international level, support of a sector dialogue in the partner country

- **National institutions:**

acts as official partner for cooperation with donor, formulation and selection of program and program area, discussion and development of programs and integration to the national sector policy and program, selection of program areas and components, supervision of the program results, development of a sector dialogue

water sector – stakeholder involvement - II

- **Provincial / District administration:**
regional planning and management of water resources and water infrastructure, general planning and tendering infrastructure projects, collection of information and demand from community level, communication and response to the community and user level
- **Community administration:**
mobilisation and organisation of users, administration of water, ownership of infrastructure, operation and maintenance of infrastructure, protection of sources, communication with user level on demand and change of demand, information of users on their rights and potential.
- **Local user organisations:**
supervision of operators of water and sanitation infrastructures, preparation of development plans according to their demand and the water right
- **Operators:**
operation and maintenance of water and sanitation infrastructures;
- **Civil society:**
organisation of users, information and dissemination, community development, advocacy etc.

working principles

- User participation
- Continued community mobilisation
- Sensitive use and protection of water sources
- Ensuring basic sanitation and promoting ecological sanitation toilets
- Appropriate technology and cost efficiency
- Sustainability of water and sanitation schemes
- Networking the schemes

cost efficiency

the technical infrastructure has to be **affordable**, **manageable**, **adaptable** and **expandable**.

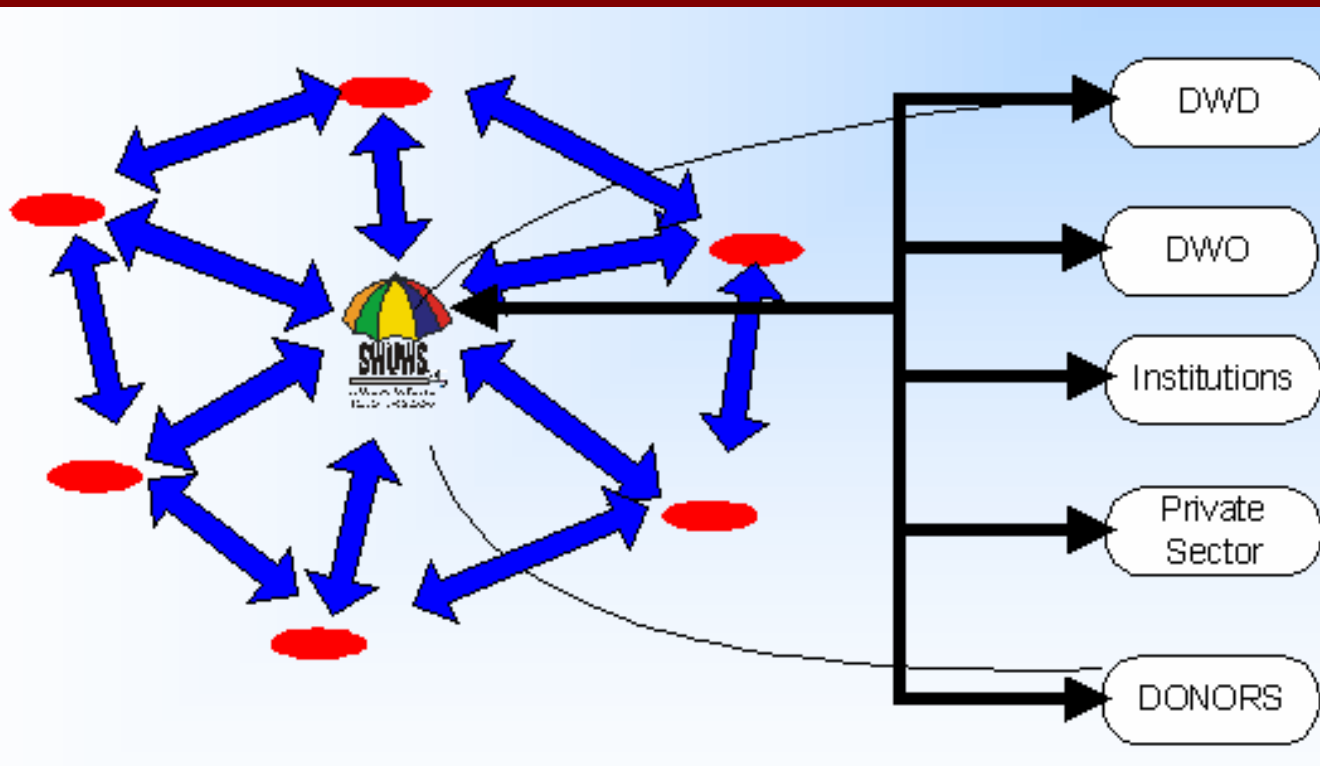


to safeguard the users' ability to pay for the continued operation, the project opts for increased construction cost instead of high running cost:

- photovoltaic pumping instead of diesel pumping
- water kiosks for protection of installations

Networking local organisation

an association of water and sanitation boards:



- building a strong working team through networking the schemes
- regular monitoring
- offering of services beyond easy reach of the individual schemes (audits, water quality tests, leak detection...)
- organization of training opportunities

principles of sector implementation and support in development cooperation

- Principle of subsidiary for sector implementation

to achieve: demand orientation, commitment, awareness

to avoid: centralisation, in transparency

tool: program approach

- Principle of „supersidiary“ for sector support

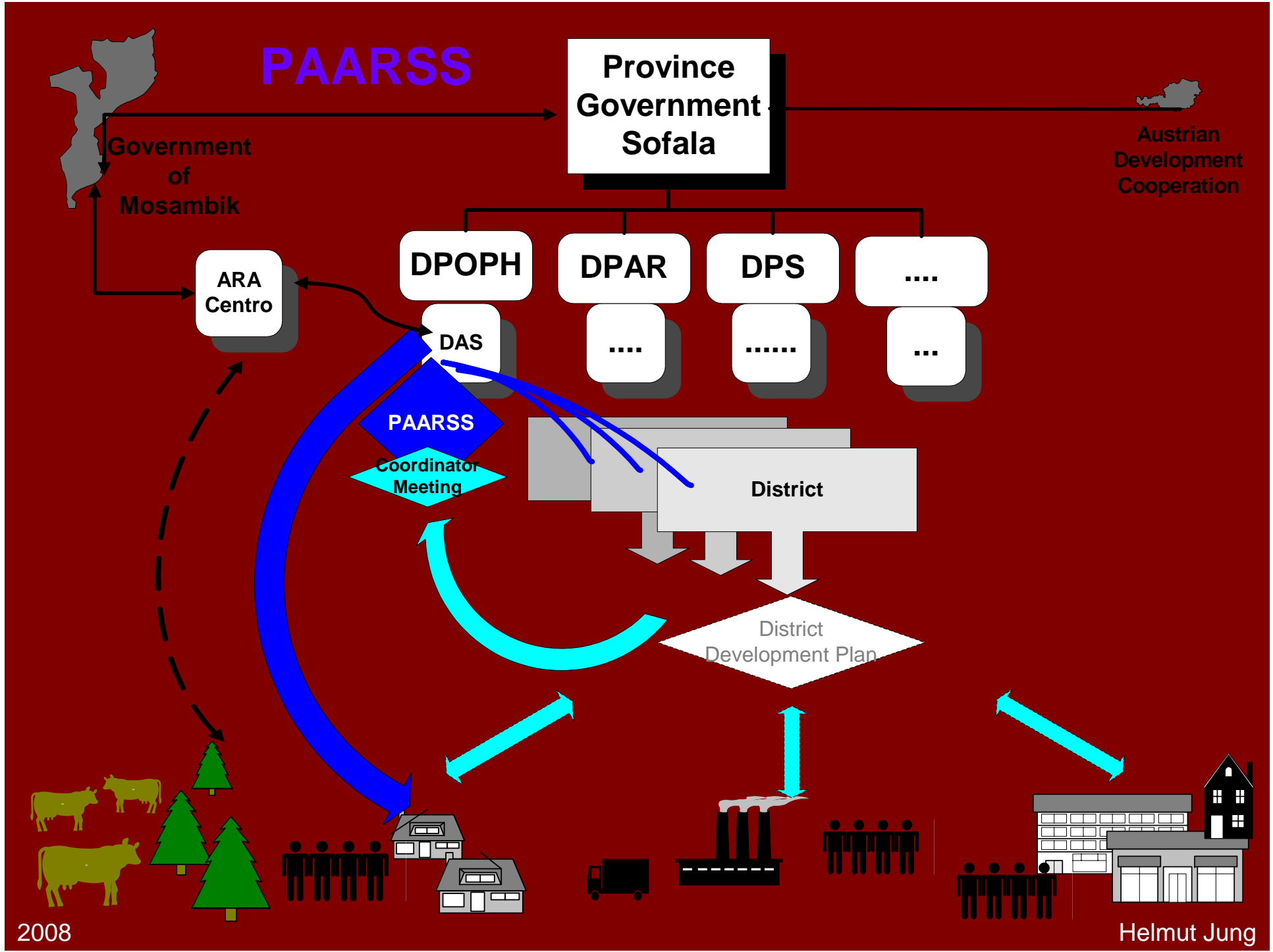
to achieve: development of local institutions and actors

to avoid: social disparities and parallel structures

tool: Sector wide approach, budget support

Regional Program Design Moçambique, Sofala Province

PAARSS



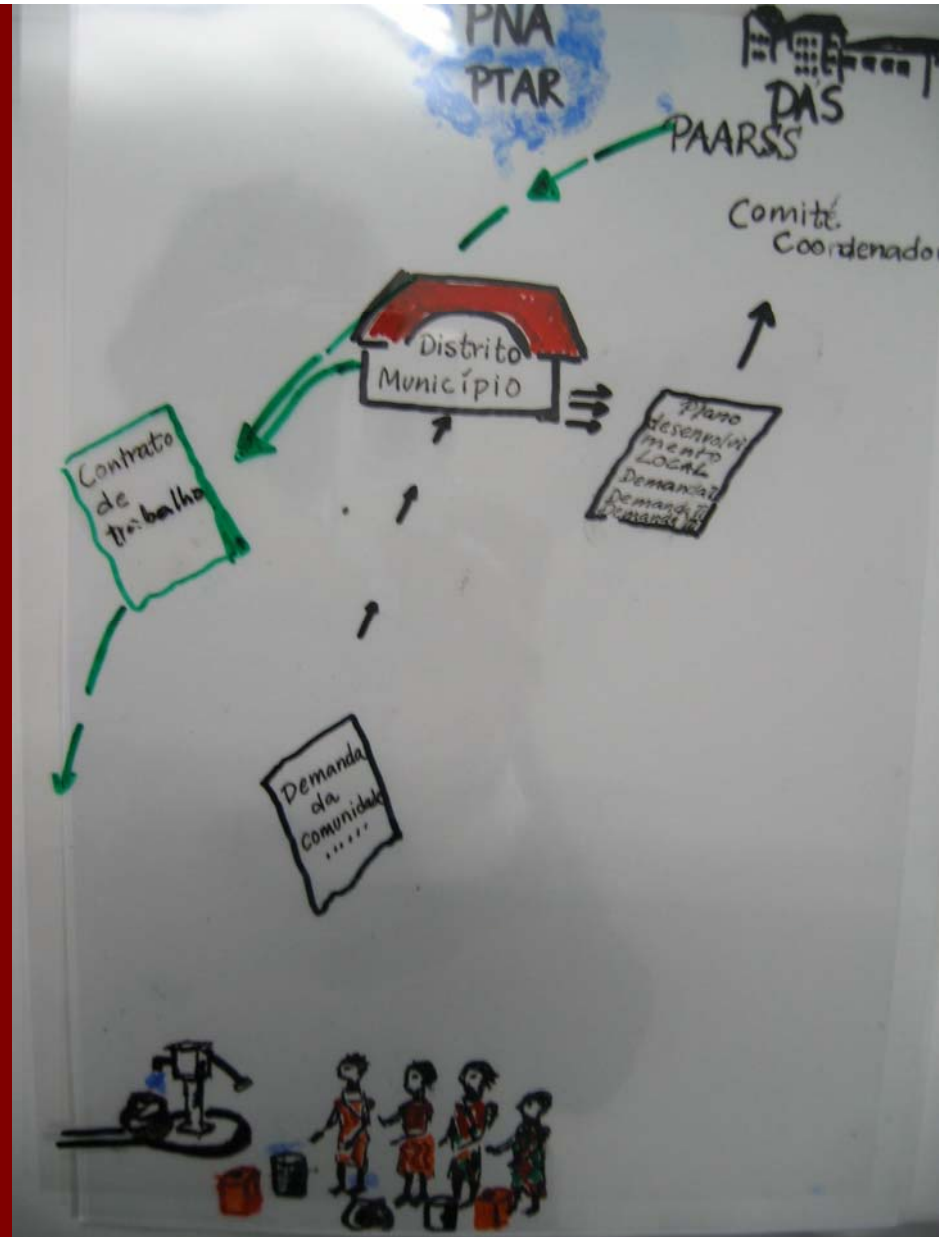
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PNA
PTAR



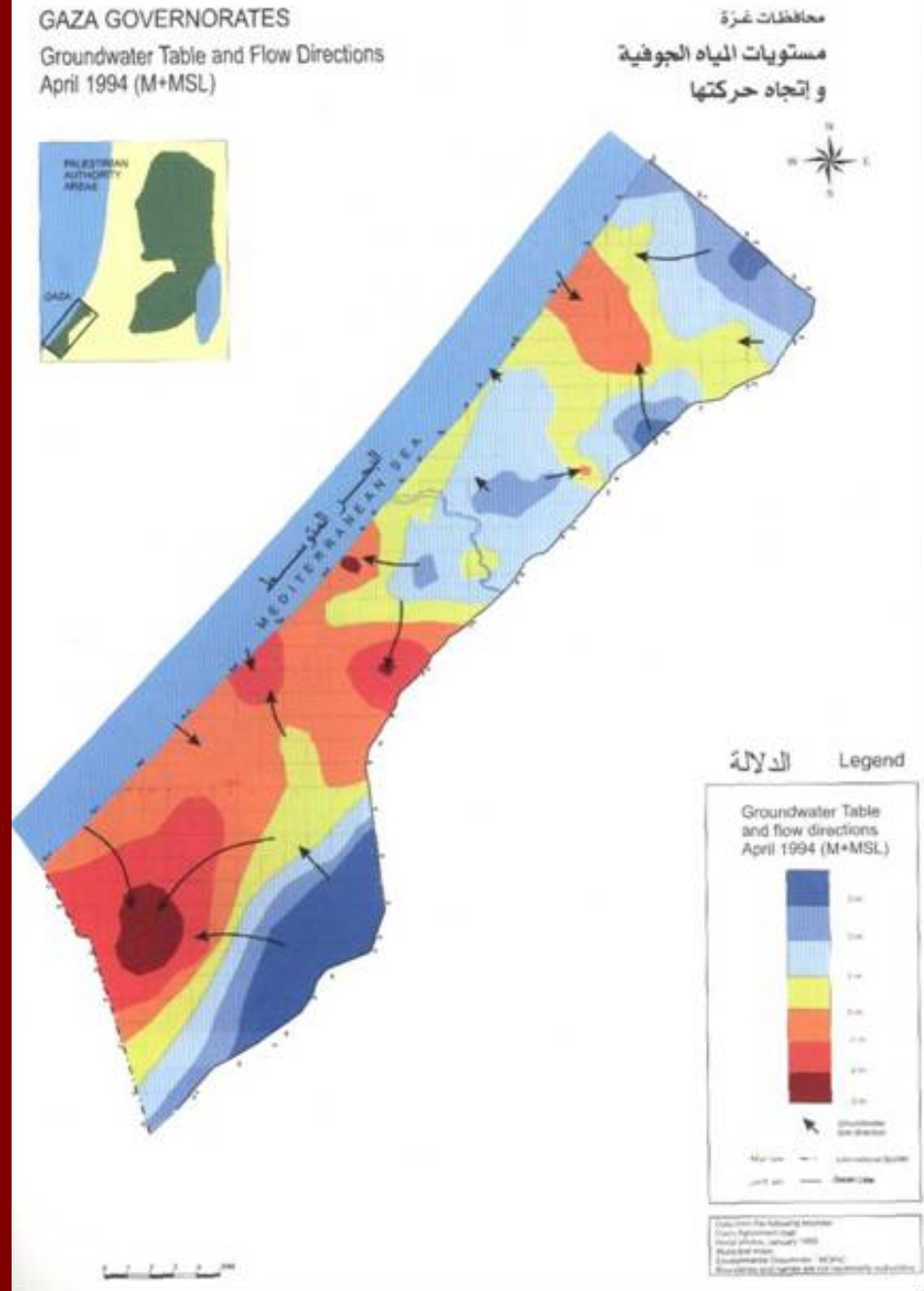




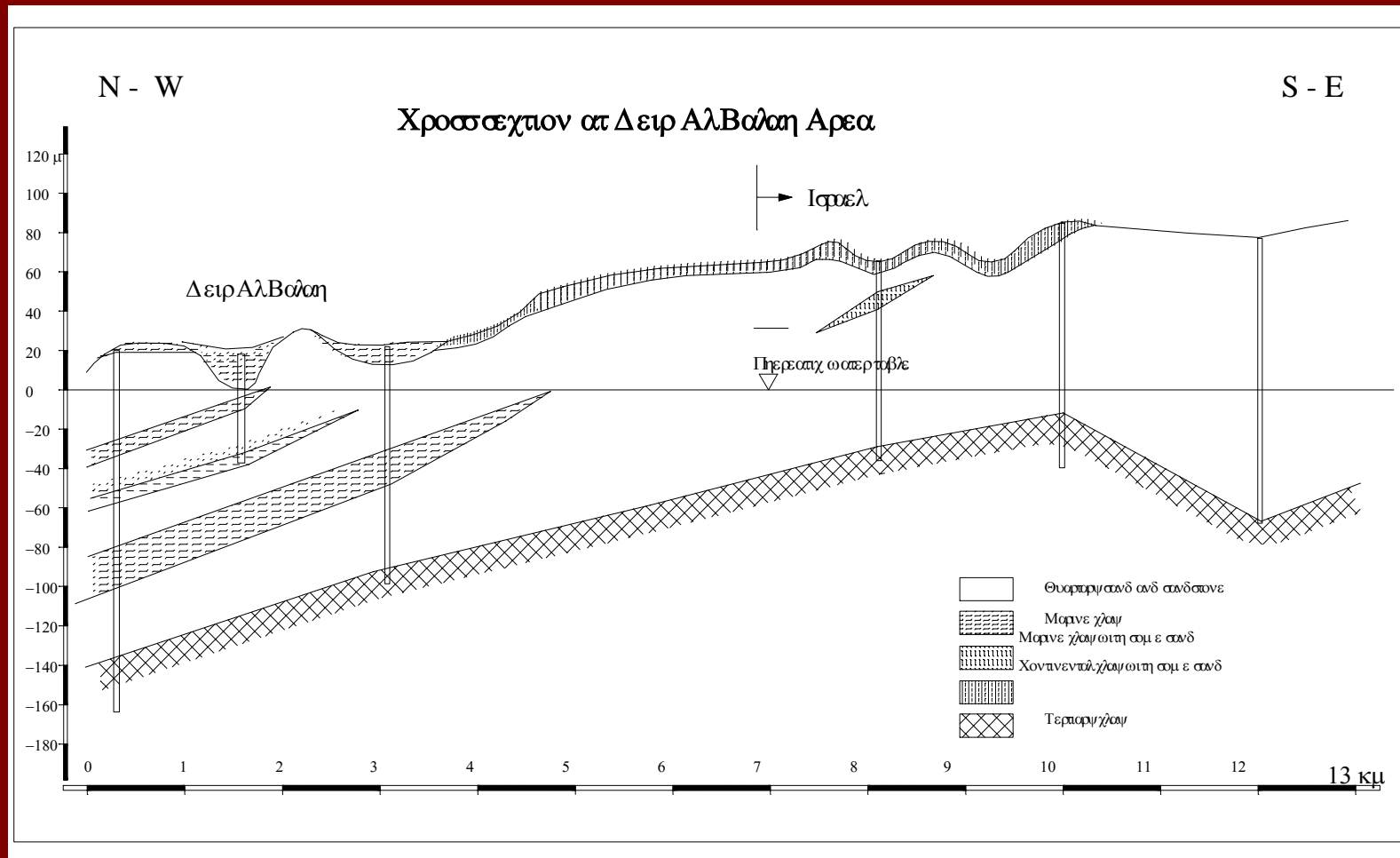


Water Desalination Gaza, Palestine

Groundwater in Gaza Strip



Groundwater situation Gaza Strip

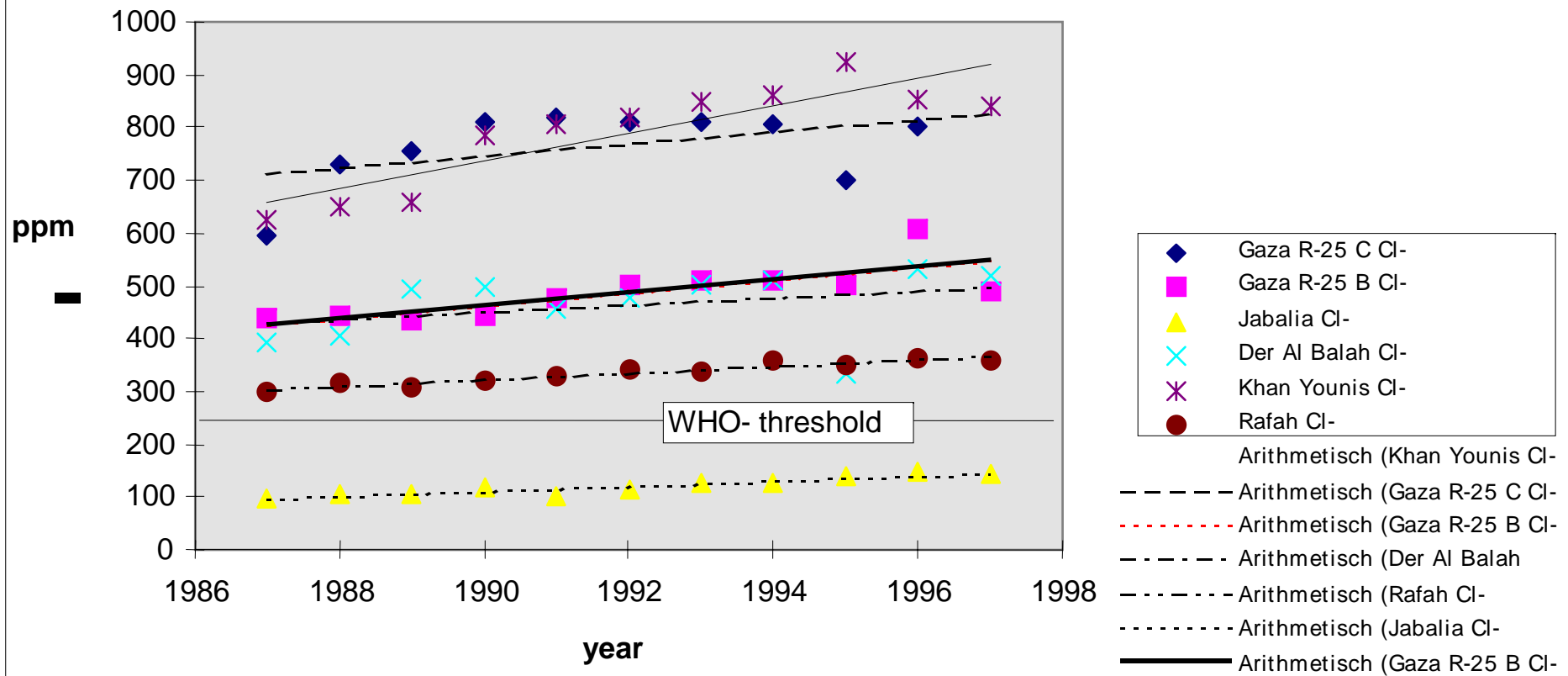


Water balance Gaza Strip

type of recharge	mio. m ³ /a	abstraction	mio. m ³ /a
precipitation	46	drinking water	40
re - infiltration	37	irrigation	80
		industry	2
		evaporation	6
total	83		128

Development groundwater quality

Cl⁻ concentration



Support by ADA

- **Increase amount of safe drinking water even in times of shortages with focus on poor**
Construction a desalination plant 2400m³/d and distribution systems
- **Avoid further degradation of groundwater potential**
use bank-filtrated seawater instead of groundwater
- **Separate functions of planning/regulation and operation**
Out-sourcing of operation and maintenance to a private operator



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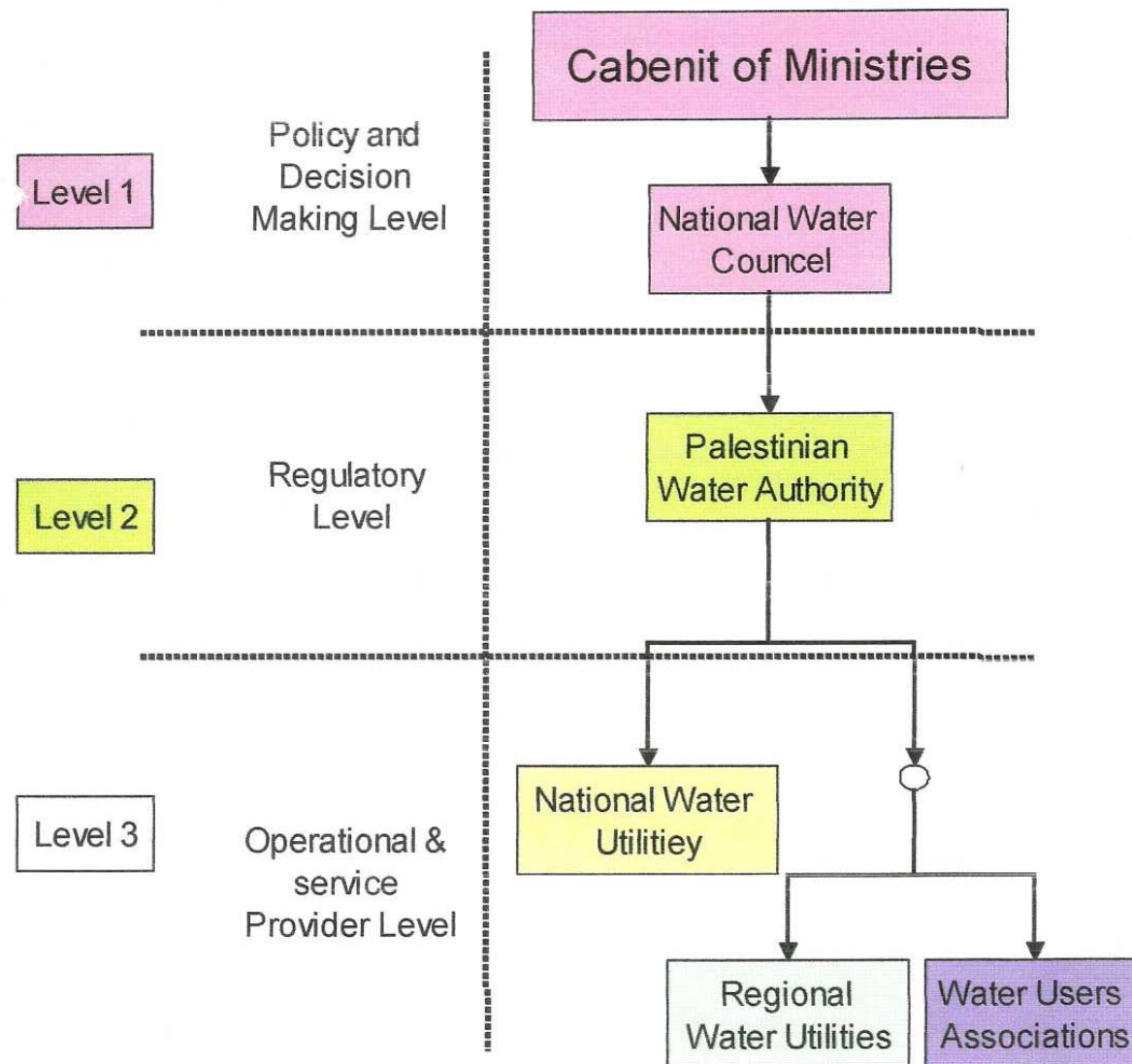
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Water Sector Structural Framework



**thank you for your
attention**



the road of development is always under construction



