Shared Water Resources and their Management

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Social and economic development depends to a large extent on the availability of adequate water resources in quantity and quality.

This fact is not felt in water rich countries, but strongly perceived in water poor countries

Increasing population, improving living standards, industrialization and generally socio-economic development have, during the last few decades, led to higher demand on water resources.

Many countries especially those of the semiarid and arid climatic zones have become unable to satisfactorily provide the required water amounts to users with suitable quality.

Water shortage and water quality problems culminate when water resources are shared among countries, because countries try to unilaterally develop these resources without due consideration to other countries' fair shares in that water source.

In addition, water resources, especially non-renewable groundwater stocks are being exploited in countries irrespective of their neighbors or coming generations rights in such wealth.

In some water rich countries, environmentally irrelevant socio-economic development has, during the last few decades, rendered the quality of many water resources unsuitable for their pre-developmental uses, which has badly impacted health and environment.

Situation of shared water resources

The situation of transboundary water resources has, therefore, turned to become a new area for disputes and conflicts among countries sharing one water source or among the water use sectors within a country depending on one water source.

Combined with the overexploitation of resources the whole water issue has become a big concern for individuals, societies, policy-makers and governments.

Developing water resources fulfills the socio-economic needs of societies for that water and **once a water exploitation project is in place, it becomes extremely difficult to eliminate or to cancel because of that project economic and social services to societies**.

Therefore, elimination might lead to social discomfort, unrest and conflicts among use sectors or among countries sharing such resource.

Therefore, it has become

a social,
political,
local and
regional

imperative to exploit water resources within one country and those shared with other countries in a

logical fair way.

International law principally bases on:

"Develop a water source in a way not to cause harm to others sharing the same source"

which means it is a moral principal than a law. In addition, such moral principals can only serve as a "**basis to share water"** and not to share water or to solve water conflicts.

The inadequacy of international lows and by-laws to solve conflicting interests in trans-boundary water resources forces to search for other mechanisms for the fair sharing of water resources.

In addition, bilateral and multilateral sharing agreements become generally obsolete when changes in the water regime and its governing conditions take place. As an example on that one can think of climatic changes. "Which country and how will the sharing countries bear the consequences of such changes"?

Bilateral and multilateral water sharing agreements such as those on the Jordan, the Nile, the Euphrates, the Tigris Rivers and others proved to be inadequate to withstand development, changes in the water regime, climatic changes or even changes in this or that political system etc.

The inadequacy of river basin agreements has been recently demonstrated on the example of Ethiopia constructing the Nahda Dam on the Nile River. The Ethiopian Foreign Minister declared during the first week of November, 2016 that Ethiopia does not recognize the 1929 and 1959 agreements on the Nile and will not abide to these agreements because Ethiopia was not part in these agreements and these agreements reflect only the interest of Egypt.

Hence, new mechanisms for sharing water have to be developed. The most appealing and promising mechanism seems now to be the Joint Management of hydrological basins by sharing countries or use sector.

How to reach at Joint management of hydrological basins?

1. Scientific detailed studies of the natural water situation in a hydrological basin including precipitation, evaporation, surface runoff, groundwater formation, water quality etc. to be studied by independent high-caliber water experts. Such studies should only consider the natural system set-up in the basin.

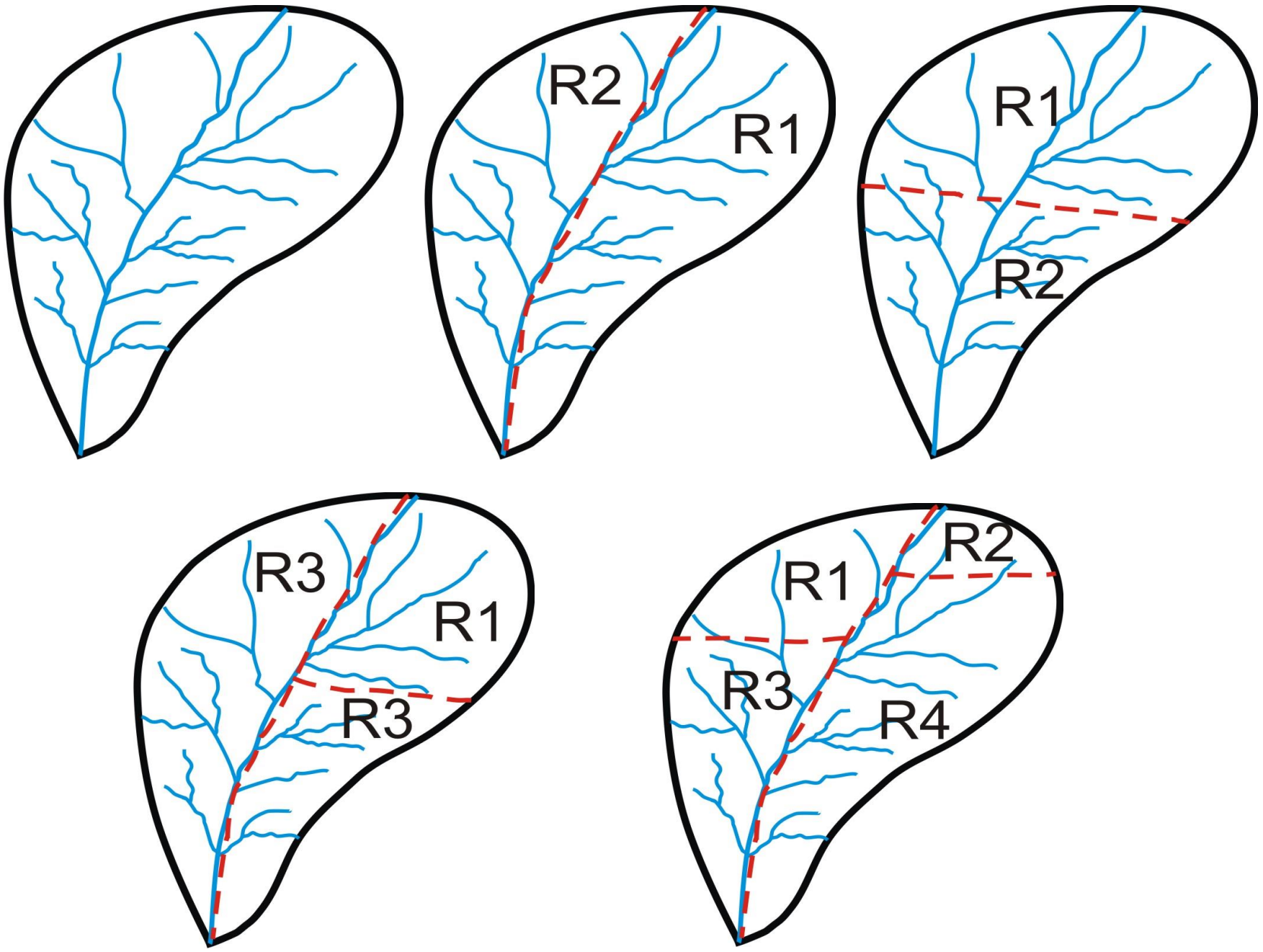
2. Details on the recent and historic water uses of the shared water resource in the different countries.

3. Studies on the water requirements for each use in the water basin parts of the different countries.

4. Required water project to maximize benefitting from the water resources.

5. Development of scenarios for water use per country and sector. The scenarios should only lead to win/win situations for all water users and use sectors.

6. Scenarios should then be discussed by the high level administration of the different countries within each country and among the countries sharing a water source. This seems to be the most difficult task of the **Joint Management Approaches**, but also it seems to be the most relevant way to reach at fair and dynamic (year by year) sharing of a basin's water resources in a win-win situation for all partners or riparian countries.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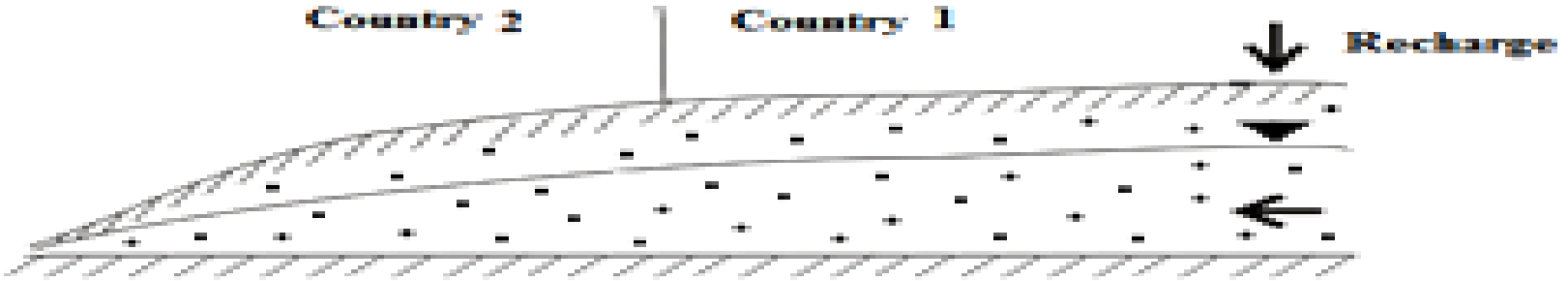
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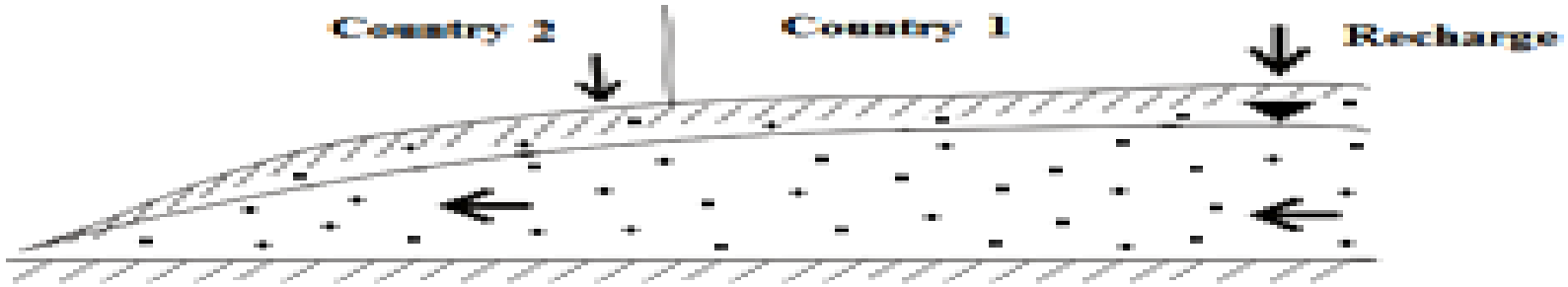
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Table: Water share of a country within the catchment is function of:

f ~ A * F * B * FQ * FS * BQ * BS * AU * DU * IU * HU * RT * S * E * P

Water resources of a basin = ∑ Shares of countries 1, 2, 3,…

Parameter	Symbol
❖ Area of catchment	A
❖ Flood flow	F
❖ Base flow	B
❖ Flood water quality	FQ
❖ Flood water salinity	FS
❖ Base flow quality	BQ
❖ Base flow salinity	BS
❖ Agricultural water use	AU
❖ Domestic water uses	DU
❖ Industrial water uses	IU
❖ Historical water uses	HU
❖ Historical out-of-catchment used water	
❖ Required treatment for drinking uses:	RT
• Filtration and chlorination	Fi
• Sedimentation, flocculation, filtration and chlorination	Se
• Activated carbon, sedimentation, flocculation, filtration, etc.	Ac
❖ Social relevance (Employment, food provision, food security)	S
❖ Economic dependence of states and people	E
❖ Political sovereignty and relations to other sharing countries	P


Thank you
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