

Practical approaches to transboundary water benefit sharing

Halla Qaddumi

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Results of ODI research presented
in preliminary form for discussion
and critical comment

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water benefit sharing**

Halla Qaddumi

hqaddumi@worldbank.org
Former Research Associate at ODI,
currently at the World Bank

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Overseas Development Institute
111 Westminster Bridge Road
London SE1 7JD

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List of Acronyms

ASEAN	Association of Southeast Asian Nations
GEF	Global Environment Facility
NGOs	Nongovernmental Organizations
MDGs	Millennium Development Goals
RIAs	Regional integration arrangements
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
ZACPLAN	Zambezi Action Plan

1. Introduction

The economic, social, and environmental importance of water resources cannot be overstated. Water is a vital resource, critical for healthy living conditions and sound ecosystems. Drinking water, food production, energy supply, and industrial development are dependent on water availability. Yet, the rising demands associated with rapid population growth and economic development place increasing pressure on this fragile and finite resource. This is already evidenced at the sectoral level by insufficient and inadequate supplies, at the national level, by competing demands between sectors, and at the international level, by conflicts – or the threat thereof – between nations sharing transboundary water resources. The situation is expected to worsen, with a quarter of the world's population predicted to face severe water scarcity in the next 25 years, even during years of average rainfall (Schiff and Winters, 2002). The water management challenge is, thus, enormous. The manner in which it is confronted will determine future patterns of development, macroeconomic growth potentials, and the extent of poverty burdens.

More than 260 river basins covering almost 50% of the earth's land area are shared by at least two countries, making many countries dependent on the use of common water resources for national development (Wolf, et al, 1999). Unilateral action by any one country concerning international basins is often ineffective (fish ladders in an upstream country only), inefficient (hydropower development in a flat downstream country), or impossible (many developments on boundary stretches) (Mostert, 2005). However, cooperation in managing transboundary water resources can be difficult, not least because property rights are often unclear and contested.

'Benefit sharing' has been proposed as one approach to bypass the contentious issue of property rights. The idea is that if the focus is switched from physical volumes of water to the various values derived from water use – in multiple spheres, including economic, social, political, and environmental – riparians will correctly view the problem as one of positive-sum outcomes associated with optimising benefits rather than the zero-sum outcomes associated with dividing water.

The case for sharing benefits is a compelling one. A river basin is a common pool resource¹, meaning that use of it by one riparian (or indeed individual) will necessarily diminish the benefits available to others. In other words, water use in one part of the basin creates external effects in other parts. If these externalities are not 'internalised', the overall benefits are reduced and the outcome is sub-optimal. Thus, both hydrology and economics concur that a river basin should be treated as a single unit to maintain the physical integrity of the system and to internalise externalities.

The question, then, is not whether the concept of benefit sharing has appeal, but rather how it can be operationalised. In other words, how is it that riparians to a transboundary river arrive at 'seeing' the benefits from optimal water management, such that their interests coincide with cooperation?

This paper considers practical mechanisms for moving towards an operationalisation of benefit sharing. The utility of the concept is not disputed here, nor is there any attempt to delve into the debate of whether or not there is common agreement with regard to its various (de)merits. Such discussions are left for others. The focus is on steps for putting the concept into practice and the point of departure is lessons learned from existing cooperative efforts. In addition to case studies, the paper draws on literature from a wide array of disciplines, including economics, international relations, and political science. Written from the perspective of an economist, it attempts to demonstrate the utility of appealing to this field as one potential means of injecting some degree of objectivity into what is otherwise a highly political exercise.

¹ A common pool resource has the same attributes as a pure public good, but its benefits are subtractable or rival (the use of the resource by one individual diminishes the benefits available to others). A public good is defined as a good that is non-rival and that cannot be managed in such a way as to preclude its use by any individual (non-excludability).

In Section 2 of the paper, a theoretical framework is established in order to shed light on the main factors that drive cooperation in transboundary settings. In Section 3, several issues that are central to applying the concept of benefits transfer are discussed: (i) calculating the costs and benefits; (ii) optimal allocation versus equity; and (iii) water rights. Section 4 – which constitutes the main body of the paper – presents various mechanisms for fostering transboundary benefit sharing, drawing extensively on experiences from existing cooperative initiatives.

2. A theoretical framework for applying benefit sharing

Given that full agreement of all riparians is essential for integrated development, ‘the situation in international river basins exemplifies the pervasive collective action problem’ (Lowi, 1993). Two main analytical traditions have addressed the problem of collective action: the theory of public goods (and by extension common pool resources) and game theory. Within these, various models have been designed to support the conclusion that under conditions of ‘anarchy’ due to the absence of an overarching governing mechanism, cooperation between individuals or states will be difficult, if not entirely impossible, to achieve. At the same time, more sophisticated models (i.e. those with longer time horizons), have shown that ‘under suitable conditions, cooperation can emerge in a world of egoists without central authority’ (Axelrod, 1984).

The ‘suitable conditions’ or incentives to cooperate are determined by three main factors: first, the type of good (i.e. its subtractability, refer footnote 1) – for example, the expected gains from agreement may be greater with non-renewable resources where degradation is irreversible than with renewable resources where regeneration may be possible; second, the number of ‘players’ (riparians) – in general, the larger the number of players, the more difficult to achieve cooperative outcomes, *ceteris paribus*; third, the heterogeneity or homogeneity of riparians (i) capabilities, (ii) preferences or interests, (iii) beliefs or information (Keohane and Ostrom, 1995).

Capabilities refer to the relative power – including economic, political and geographic (e.g. location on a river) – and bargaining strength of the riparians. A riparian’s preferences or interests determine its valuation, in terms of costs and benefits, of potential strategies and outcomes. Preferences and interests are themselves a function of such factors as the riparian’s discount rate of natural resource use², sense of shared identity with other riparians, and other considerations, such as a nation’s concerns for issue linkage, national image and sovereignty (LeMarquand, 1976). A riparian’s beliefs and the information at its disposal, in addition to its processing of this information, will colour its perception of the issue and therefore indirectly affect its interests or preferences. The number of players and their capabilities, preferences, and information affect the costs of transacting, the ability to communicate, and the ability to make credible commitments. Changes in any of these variables, then, may alter the incentives of players to cooperate. The key question is how to affect a change in these variables such that (more) cooperative outcomes are realised.

As will be seen in the successful examples given below, application of benefit sharing would need to address many, if not all, of these factors. For example, a major focus should be on promoting consensus on information and data, as well as quantifying the overall and distributive costs and benefits of various development scenarios. Countries will join in agreement only if they obtain positive gains (or greater benefits than through unilateral action alone), and if they feel that they will receive a fair share of those gains. The major stakeholders are not ‘countries’, ‘states’ or ‘riparians’, as abstract wholes, but various national government bodies and sectoral bureaucracies, regional and local governments, civil society, individual water users, influential individuals, and others. The perceptions and motivations of all of these groups must be understood and reflected in any cooperative arrangement that is to be viable in the long run. A central feature of benefit sharing is issue linkage or ‘broadening the basket’ of potential benefits, and it is here that ongoing regional initiatives might play an important role. Regional concerns, however, should not and cannot overshadow national economic policies, which have the ability to hinder or assist in efforts at more extensive collaboration. These issues, amongst others, are discussed in further detail below.

² The discount rate is the present value of future payoffs, which essentially weighs the importance of current actions relative to future actions.

3. Arriving at optimal and equitable allocations

3.1 Calculating benefits and costs

The first and obvious question when applying the concept is what are the benefits and the costs? Various authors have discussed this matter in depth, including environmental, economic, regional integration, increased trade, and reduced military expenditure. Sadoff and Grey (2002 and 2005) specify four types of benefits (i) benefits to the river; (ii) benefits from the river; (iii) the reduction in costs because of the river; and (iv) benefits beyond the river. Phillips, et al (2006) re-categorise these into three: (i) security; (ii) economic; and (iii) environmental. The costs of cooperation include financial, institutional, political, and any costs of unilateral opportunities (benefits) foregone.

While recognising the widest possible range of potential benefits that cooperation could bring is of conceptual interest, it is argued here that vague and distant notions of, for example, ‘security’ are of a secondary order. The primary goal is to benefit regional populations, and specifically to tackle the key issue of poverty reduction through sustainable development (ODI and Arcadis, 2001). This overarching goal also makes the distinction between ‘economic’ and ‘environmental’ benefits perhaps unnecessary.

Concretely, the benefits may include reduced effects of hydrologic variability, flood and drought mitigation, increased system-wide yields of water, improved environmental management, and hydropower generation. All of these have economy-wide impacts, directly affecting productive output, employment levels, poverty, and human health. For example, where rainfall is highly variable, investment patterns will reflect risk-averse behaviour as water users attempt to cope with uncertain supplies. Farmers will be hesitant to invest in land improvements and capital-intensive production technologies. Industries will be forced to source their own water supplies, such as private boreholes or wells, affecting their cost of production and competitiveness. Resorting to private supplies results in poor operation and maintenance of municipal schemes where the full benefits of economies of scale in water provision cannot be realised (Sadoff, et al, 2003). This leads to a vicious circle of sub-standard provision, limited coverage, high water tariffs, and unwillingness to pay for services — thus, the cycle continues. Correcting such inefficiencies through improved water management would result in first order benefits of a significant magnitude, and, thus, it is here that emphasis should be placed.

The Millennium Development Goals (MDGs) should also be addressed in this context. There is a strong link between the potential benefits from transboundary cooperation and the MDGs³. Water is central to most of the goals, including the crucial contribution of effective water management at both national and international levels to food security and poverty alleviation.

As a first step to realising benefit sharing, the costs and benefits of cooperation need to be articulated in an objective language that is intelligible to the stakeholders involved. Here economic analysis is useful and there are a number of available tools for estimating both use and non-use values and costs, including the environment (for a review of tools and their practical applications, see Briscoe, 1996 and Rogers, et al, 1998). These can be fed into sophisticated multi-objective river basin optimisation models, with the ability to change the weights attributed to the various objectives. Such models are able to compute the aggregate value of water as it moves throughout the entire river basin system, thereby incorporating all interactions, potential external effects and opportunity costs of specific uses of water.⁴ Additionally, the time-frame within which benefits accrue from particular development scenarios can be investigated through dynamic analyses. By incorporating a time factor, such analyses

³ The MDGs call for: the eradication of extreme poverty and hunger; universal primary education; gender equality and the empowerment of women; the reduction in child mortality; improvement in maternal health; combat of HIV/AIDS, malaria and other diseases; environmental sustainability; the development of a global partnership.

⁴ Opportunity costs are the foregone benefits from the next-best use of a unit of water.

can identify gains generated in the short, medium, and long run, as well as how the sequencing of actions might affect the trajectory of benefits. For example, the immediate benefits of cooperation might be reduced costs associated with flood control; the medium-run benefits, increased agricultural yields; and the long-run benefits, a stronger agricultural sector due to productivity-enhancing investments. Dynamic river basin planning models can account for both the inter-temporal and spatial effects of development options.

A number of analyses of this type have been conducted on various river basins, such as the Jordan River basin (Fisher, 1995 and 1996). This type of analysis allows the relevant parties to identify and explore the various trade-offs associated with different cooperative scenarios (in addition to the costs of non-cooperation), thereby bringing clarity to the question of how they can and why they should cooperate. Showing that there are benefits to be had in strictly economic terms does not diminish the importance of potential benefits from other spheres. However, focusing on economic analysis is likely to be an extremely effective tool for altering perceptions precisely because it yields results that are quantifiable and therefore less subject to contestation than more qualitative analysis.

Cooperative Resource Assessments are a more comprehensive tool, typically including a transboundary analysis, a distributive analysis, and an institutional analysis (Sadoff and Grey, 2005). Their use is in exploring opportunities for cooperation and, in so doing, providing a common language and point of departure for negotiations. However, even in this context, the focus should be on quantifiable results.

3.2 Optimal allocation versus equity

As economic theory tells us, optimisation has nothing to say about equity. In other words, outcomes that are optimal in the aggregate are not necessarily equitable. Mechanisms for redistributing the costs and benefits of cooperation are required if a cooperation is to be perceived as fair to all riparians (and therefore more politically viable). There are, fortunately, historical examples of formulae for equitably allocating the benefits from water amongst riparians. For example, as part of the 1961 Columbia River Treaty, the US paid Canada for the benefits of flood control and Canada was granted rights to divert water between the Columbia and Kootenai for hydropower purposes (Giordano and Wolf, 2003).

In addition to the direct payment for benefits (or compensation for costs) other mechanisms exist, including direct payment for water itself, power-purchase agreements, and financing and ownership arrangements. These mechanisms have been adopted both independently and jointly, as detailed in a study of 18 agreements of a benefit sharing nature (Klaphake, 2005). Most of the cases centred on dam construction designed to generate and use hydropower. The Lesotho Highlands Project on the Senqu/Orange river basin utilises a number of mechanisms, including direct payments for water, purchase agreements and financing arrangements. On the Senegal River, Senegal, Mali and Mauritania agreed to share the development costs and benefits of jointly-operated common infrastructure using a burden-sharing formula (*la clé de répartition*). The agreement between India and Nepal on the Mahakali River includes cost sharing and a power purchase arrangement. The India-Bhutan agreement on the Chukha hydropower project includes payments made by India to Bhutan for power exports (which represents some 70% of total power generated and is a significant source of revenue for Bhutan). The agreement between Kazakhstan, the Kyrgyz Republic, Uzbekistan, and Tajikistan in the Syr Darya basin/Aral Sea involves an arrangement for bartering hydropower, gas, coal and oil.

Distributional issues are of vital importance. The opportunity cost of not reaching agreement because of a failure to establish compensation mechanisms is strikingly clear in the case of the Nile River basin. Egypt and Sudan concluded a treaty in 1959, which included building the Aswan High dam (and allocating the total yearly flow between them). By reducing seepage and evaporation losses, building dams upstream on Ethiopia's Blue Nile would have increased available water supply by an estimated 6 billion cubic meters, in addition to generating three times more hydropower than that which was

produced by the Aswan Dam. However, riparians were unable to address the unbalanced distribution of benefits and costs – with Ethiopia gaining the equivalent of US\$1.2 billion in benefits and Egypt and Sudan each losing US\$ 300 million – and the ‘next best’ option was ultimately adopted by Egypt and Sudan (Schiff and Winters, 2002).

It should be noted here that the benefits to be had from transboundary cooperation and the manner in which those benefits are distributed in-country is as significant as how they are distributed amongst countries. The perceptions of stakeholders who make up the ‘state’ and how these influence policy and implementation are addressed in Section 4.

3.3 Water rights

There is a question as to whether the issue of water rights can be separated from that of benefit sharing. For example, in cases where benefit sharing implies transfers of existing fixed water supplies, some assignment of water rights is required in order to determine any compensation due. Indeed, it has been argued that water rights and benefit sharing should more appropriately be viewed as two sides of the same coin rather than as competing approaches (Phillips, et al, 2006). On the other hand, in certain cases, it might be possible to separate water rights from benefit sharing by focussing initially on the incremental gains from cooperation. Such an approach is feasible where joint management would generate additional water supplies through, for example, the construction of storage structures or desalinisation plants.

Unfortunately, appeals to international water law have offered little direction on volumetric water allocations, partly because they themselves are contradictory and partly because propounded notions such as ‘equitable use’ and ‘avoidance of significant harm’ remain vague and, therefore, difficult to apply directly. History shows that riparians negotiate water arrangements according to their own methods, rather than appealing to principles of international law that are not universally accepted (e.g. Israel and Jordan on the Jordan river basin, Sudan and Egypt on the Nile river basin).

The majority of existing transboundary treaties does not, in fact, delineate specific allocations. Those treaties that do tend to allocate a fixed quantity to all riparians but one, which is then forced to accept the balance, regardless of fluctuations (Hamner and Wolf, 1998). Such water sharing formulae inevitably lead to inequitable allocations, not least because they incorrectly treat water as a stock rather than as a flow. It is not clear that the difficult issue of water rights will disappear with the arrival of benefit sharing, as is demonstrated by concerns voiced time and again by representatives of riparian countries who feel that they have an unjust share (e.g. Bangladesh on the Ganges River). This means that water rights and benefit sharing should be treated jointly, and in so doing, basin dynamics – including quality and groundwater – must be more fully understood (and reflected in agreements). The latter, alone, would go a long way in resolving some of the currently most contentious cases.

4. Fostering transboundary benefit sharing

4.1 A process-oriented approach

There are various degrees of cooperation, ranging from simple information and data sharing to joint management (including joint ownership of structures). In practice, cooperative arrangements develop in several stages, from convening to negotiation to conclusion of an agreement, and, finally, to implementation (Mostert, 2005).

Information acquisition and data sharing are often highly contentious issues to start off with. Indeed, there are cases where hydrologic data are guarded as a state secret or are used as a technique to stall negotiations. It is clearly impossible to speak of ‘benefit sharing’ or ‘water sharing’ when riparians cannot agree on the data on which the analyses are to be based. The first stage, thus, should begin at a very elemental level, with technical cooperation on data and information sharing. This should include not only hydrological information, but also the national social, economic and environmental information that are necessary inputs into the determination of benefit sharing formulae. Such activities represent little risk, but still help to develop a common factual basis and the beginnings of trust.

Data collection, preparation and processing are costly endeavours requiring human and institutional capacity. However, negotiations are often constrained by capacity imbalances among countries and an inability in many to analyse and inform policy positions and decisions (Sadoff, et al, 2003). It is here, then, that efforts should initially be targeted. A major component of the Nile Basin Initiative focuses on developing socio-economic information bases, and skills-strengthening in macroeconomics, policy analysis, and alternative scenario-building exercises. These are designed to create an enabling environment for cooperative development and physical investments carried out by smaller groups of Nile riparians at the sub-basin level (NBI, 2001).

Getting the process started is, ultimately a question of political feasibility. As discussed above, communication amongst riparians at a technical level can assist in establishing an environment that is conducive to further engagement. Several mechanisms have been identified as being helpful in the subsequent stage of concluding an agreement (Golub, 1996; Mostert, 2005; LeMarquand, 1977):

- **Issue linkage:** Linking upstream-downstream issues to other issues where the downstream state holds power or control and the upstream state is the requesting party (e.g. Kazakhstan, the Kyrgyz Republic, Uzbekistan, and Tajikistan in the Syr Darya basin/Aral Sea).
- **Diffuse reciprocity / Good relations:** Accepting an agreement – even perhaps on less favourable terms – in order to keep good relations and to create a ‘reservoir of goodwill’ with other countries (e.g. South Africa and Lesotho in the Lesotho Highlands Water Project and Bhutan and India in the Chikha hydropower project).
- **Large geographical scope:** Extending the scope of an agreement to, for example, include rivers where the downstream river is upstream, and vice versa (e.g., Mozambique, South Africa and Swaziland on the Incomati River basin and the Maputo River basin).
- **Side payments:** Providing financial compensation in return for a concession (refer above).
- **‘Slack Cutting’:** making use of international fora in order to introduce a more ambitious national policy than would otherwise be possible through national channels alone.
- **Exercise of power:** Possessing other sources of power – economic, political, military – that compensate for an inferior geographical (downstream) location (e.g. Egypt in the Nile basin and Israel in the Jordan basin).⁵

⁵ The central issue of power in defining transboundary relations is at the core of Hydro-hegemony theory (major proponents include Mark Zeitoun and Tony Allan at King’s College, London, and Marwa Daoudy at CERI Sciences-Po).

Agreements – which can take several forms, from formal to informal, binding to non-binding – establish the institutional structure or ‘rules of the game’ (Ostrom, 1990 and ODI and Arcadis, 2001). That is,

- who should participate and at what level (*Constitutional Rules*)
- the transparency of these processes and who is included (*Decision Rules*)
- the principles by which benefits should be apportioned (*Operational Rules*)

The institutional arrangements that are established depend on the unique circumstances of each river basin. The ability to effectively implement an agreement rests on the long-run viability of specific institutional arrangements (as one water manager from Palestine stated, ‘we do not need heroes, we need institutions’.⁶). Practically, this requires establishing self-sustainable financing mechanisms that are not reliant on third party support, enhancing stakeholder participation, building institutional capacity, and developing effective tools for monitoring and reporting.

4.2 Stakeholders and the State

In all of these stages, recognition must be given to the fact that the stakeholders involved are not homogeneous states (an abstract concept), but specific groups and individuals who make up the State. Stakeholders include national and sub-national government bodies and entities within these (such as sectoral ministries), water users, powerful or influential individuals, NGOs, the private sector, and supranational organisations (such as regional organisations). Each of these parties may adopt a very different stance on transboundary water issues and benefit sharing, and yet, be key to reaching an agreement and to successful implementation. An understanding of the different perceptions and motivations of the various stakeholders and the political-economic factors that influence these is, therefore, required. Ultimately, cooperation rests not on objective measures of gains to be had, but rather on the subjective perceptions held by these various groups and how these are played out in policies, institutional arrangements and, finally, treaties.

The far from desirable results of many development programmes and at all stages of cooperation between development partners has led to a shift in emphasis to supporting stakeholder participation that can help to ensure more sustainable long-term gains. At the same time, a balance clearly needs to be struck between stakeholders as actors in improving a development process and the practical and logistical difficulties involved in attempting to achieve broad stakeholder participation. It is impossible to conform to the full array of diverging ‘voices’. Indeed, the ‘noise’ of stronger voices can effectively drown out more meaningful discussions and efforts to arrive at feasible solutions. While this reality must be recognised, given the historically weak role of stakeholder involvement in transboundary water management, support to developing the government-civil society interface is required (ODI and Arcadis, 2001). Ultimately, wider stakeholder involvement can not only improve the identification of possibilities for benefit sharing, but is also essential for the realisation of objectives, particularly at the sub-national level.

4.3 Bilateral versus multilateral cooperation

Although numerous international treaties for cooperative management have been negotiated (approximately 149 in the last century and about 300 since 1814), these are almost without exception bilateral. This fact supports the theory that achieving cooperative solutions becomes more difficult as the number of players increases. The difficulty is compounded when – as is often the case – riparians have heterogeneous capabilities (that is, relative economic, political and geographic power), interests, and perceptions.

History clearly shows that it is much more feasible to seek cooperative outcomes within a sub-unit of a river basin. In the best cases this is done on a hydrologic or sub-basin basis. For example, in the Nile

⁶ Personal Communication, Dr. Abed Al Rahman Tamimi, Director General, Palestinian Hydrology Group.

Basin Initiative, the two major branches—called the Nile Equatorial Lakes and Eastern Nile—are treated separately, meaning that gains can be realised without causing significant harm to riparians not involved. More commonly, this would mean having bilateral, rather than a multilateral, agreements (e.g. Lesotho and Africa on the Orange River, the Jordan River basin, Pakistan and India on the Indus river). Although bilateral management arrangements do not fully internalise externalities and are, therefore, sub-optimal, they are useful as a first step in helping to separate out those issues that are of most interest to two riparians and in building a relationship that could potentially become more far-reaching in the future and involve wider sets of state and non-state actors.

4.4 The role of third parties

The involvement of third parties has been instrumental in promoting cooperative arrangements in the vast majority of cases. For example, arrangements on the Mekong, which is commonly taken as a success story, would not survive were it not for the dedicated support over several decades of the UNDP and other donors. The same is true of the World Bank and agreement between India and Pakistan on the Indus River. Third parties have played a central role in the more recent moves towards cooperation on the Nile. Similarly, the cases of failure (the Ganges and the implementation of the Zambezi Action Plan, ZACPLAN) can to some degree be attributed to the ineffectiveness of third parties.

While third parties cannot alone create a conducive, political environment, they can provide direct and indirect incentives to cooperate through playing a brokerage role: (i) providing technical competence and examples of best practices; (ii) assisting in negotiation and mediation skills, including the provision of legal and other water experts; and (iii) facilitating investments in transboundary settings (Phillips, et al, 2006).

The significance of facilitating investments cannot be overestimated. As was made clear in the Indus Treaty case, the lure of financial aid can tip the balance of each riparian's benefit equation in favour of cooperation. Similarly, it has been argued that the failure in implementing ZACPLAN may be attributed to the fact that UNEP, which took a leading role in elaborating the plan, failed to solicit funds from the donor community (Nakayama, 1997). On the other hand, the ability of the Bank to use financing as an incentive was hampered in the cases of the Ganges and the Indus (since the treaty) because financial assistance to India and Pakistan had become daily business.

Specifically, four different strategies of third party support can be identified (Mostert, 2005): (i) Track I Diplomacy (cooperation); (ii) Track II Diplomacy (collaboration); (iii) Track III Diplomacy (transformation); and (iv) Continuing Support. Track I Diplomacy aims to support the conclusion of a formal agreement between riparian states, typically through mediation and facilitation. Rather than seeking to establish formal agreements, per se, Track II Diplomacy aims to reconcile the various interests involved in basin-wide development and to arrive at feasible development strategies and actions on the ground. This is typically achieved through promoting informal dialogues, research and studies, and capacity building. Track III Diplomacy addresses policies at the national and local levels, which are typically at the root of transboundary water problems. Such a strategy would, for example, target agricultural subsidies that promote water-intensive crops and contribute to basin-wide water scarcity. Finally, financial support may be required to sustain cooperation, as well as to induce it. Continuing support – in the form of financial assistance for a river basin organisation or loans for development projects – may be called for even after riparians have agreed to cooperate. The strategies are not mutually exclusive and, indeed, are best seen as mutually reinforcing. For example, Track II Diplomacy efforts may eventually lead to the initiation of discussions on a more formal basis (Track I).

Third parties have work to do in their own right to ensure that they are in fact effective in promoting cooperation and that they do not come to dominate the process by generating first and second party dependency. For example, they must be willing to support long processes; they must ensure that riparians themselves drive the process; they must increase their perceived neutrality (for example, by

identifying and using experts who are viewed as neutral); and they must develop clear and transparent exit strategies.

4.5 National water policies

A basin-wide perspective should not be adapted to the neglect of national level policies; the two have to mesh effectively to enable effective benefit-sharing that, *inter alia*, leads to poverty reduction and the achievement of national and international development goals. Although an obvious point, it is often (conveniently) ignored that water management within a riparian country is a major contributing factor to transboundary water problems and conflicts. Water policy reforms within country would, therefore, go a long way to reducing stress across the system as a whole.

In some of the most contentious river basin settings, the agricultural sector consumes a disproportionate share of limited supplies, although the sector's contribution to GDP is low or nominal (e.g. Israel and Egypt). The goal of food self-sufficiency has justified preferential treatment for the agricultural sector, arguably at significant cost to society as a whole. Factors including heavy subsidisation of water and other inputs such as electricity or fertiliser, agricultural pricing, and marketing policies, directly and indirectly encourage the production of water-intensive crops and create an incentive for over-application, which affects not only water availability but also water quality. On the supply side, the dilapidated state of water supply systems and unacceptably low levels of service provision in many developing countries attest to the fact that the policy of under-pricing water is unsustainable in the long-term. Often it is, paradoxically, the poorest of the poor who suffer the most, as they are forced to seek alternative supplies (such as purchasing water from private vendors or digging wells) at very high cost. Ultimately the misuse and mismanagement of water – particularly within the agricultural sector – is reflected and amplified at higher levels, exacerbating competition across sectors over already limited water resources.

Within such a context, at the transboundary level, appealing to water 'requirements' or 'needs' is insufficient to justify preferred allocations (except in the extreme case of ensuring the minimum quantity of water necessary for human existence), and frequently represents heavily-vested institutional interests embedded in complex political economies. Water use is not static, but is subject to the same economic forces as other commodities. Users respond to incentives or disincentives, and many economic studies demonstrate the link between water prices and use⁷. This reality has obvious implications for negotiating cooperative arrangements. The internal search for greater efficiency in water use can go a long way in lessening the possibility of perhaps irresolvable debates about systematic waste in one or another of the riparian states. Furthermore, if the question is one of cost-effectiveness, it should be highlighted that in many cases, it is relatively less costly to promote efficiency (demand side solutions) than it is to secure and/or develop additional sources of supply (either unilaterally or multilaterally). Even in the cases of heavy water stress, states would do well to review their demand-side policies as they consider alternative methods for increasing water supply, such as desalinisation (e.g. Israel).

The importance of tackling national water management policies – particularly related to the agricultural sector – has been recognised in the Nile Basin Initiative. Efficient water use in the agricultural sector is one of seven projects being implemented under the Shared Vision Program. This project is specifically designed to show that actions at the ground level are possible in the short-run and can lead to higher impacts at the national (and international) level in the longer-term (NBI, 2001).

There are, thus, many actions 'close to home' that can lead to greater efficiency in water use at the national level, improving availability at the basin-wide level and opening up 'policy space' for benefit-sharing arrangements. Instituting such policy changes will, naturally, produce winners and losers. Any reform program should address the potential negative effects on the most vulnerable sectors of society

⁷ For an overview see Gibbons, 1986.

of, for example, dismantling subsidies. This is as true for agriculture – which provides the principal means of employment in many developing countries (e.g. Egypt) – as it is for domestic water use. Targeted subsidies, including cross-subsidisation schemes, can be adopted as one means of protecting the poorest of society, while ensuring that those who can (and should) do pay for water services.

4.6 Regional integration arrangements

Regional integration arrangements (RIAs) are an increasingly important element of the global economy. Currently, there are nearly 20 ‘active’ regional blocs,⁸ a large number of which have been formed in whole or part amongst countries of the developing world. It has been argued that regional cooperation – that is cooperation that takes place on an ad hoc basis around specific projects or thematic issues, such as transboundary water management – is not the same as regional (trade) integration and, indeed, that ‘there is generally rather little connection between the two’ (Schiff and Winters, 2002). However, there are several ways in which RIAs can promote regional cooperation in non-trade issues.

First, cooperative efforts in other realms can make use of the institutional framework that is established under RIAs (including mechanisms to enforce provisions and resolve disputes). It is likely to be less costly and more effective to make use of existing institutional structures than to have custom-built separate structures for each regional agreement reached.

Second, by increasing the degree of contact and interaction amongst member countries, RIAs foster trust and mutual understanding, as well as generating practical experience in problem-solving. Third, RIAs expand the range of potential issues at stake by embedding cooperation over water within a wider framework. Putting more issues on the table (‘broadening the basket’) increases the possibility of finding a configuration of benefits that is acceptable to all parties – and one that is better linked to other sectors and wider development policy at both national and regional levels. The ability to trade off gains against losses in multi-subject agreements, importantly, reduces the size of compensatory transfers required to agree on particular issues. In contrast to single issue agreements where compensation runs in only one direction, in multi-subject agreements countries are likely to reap benefits (and incur costs) in different areas. This internally-generated counterbalancing of gains and losses diminishes the need for outright transfers, and, consequently, makes (external) enforcement of agreements less difficult.

There are several examples where RIAs have helped to facilitate cooperation in the realm of transboundary water management, specifically, and the environment, more generally. The agreement between France, Germany, the Netherlands and Switzerland on the Rhine to battle the effects of upstream salt pollution on downstream agricultural production was assisted by the fact that three out of the four countries belong to the European Union, have a history of cooperation, and, importantly value expanded future cooperation in a variety of realms. The North American Agreement on Environmental Cooperation was signed as part of a larger deal on trade and investment under the North America Free Trade Area. Initiated in 1995, the Southern Africa Power Pool seeks to establish regional power trading arrangements between Southern African Development Community (SADC) member countries, taking advantage of their comparative advantages in the production of hydropower and coal (Schiff and Winters, 2002). In all of these cases, the cost of failure to arrive at regional cooperation on specific issues was likely to be higher precisely because of the effect on negotiating other deals or on the implementation of existing deals.

Regional organisations such as SADC, South Asian Association for Regional Cooperation (SAARC) and Association of Southeast Asian Nations (ASEAN) have placed transboundary water management centrally within their agendas. ASEAN established in 2002 a Long-term Strategic Plan of Action on

⁸ The general term ‘regional blocs’ includes free trade areas, customs unions, economic and monetary unions, free travel areas, political pacts and defence pacts. The ‘activity’ of a bloc is measured by its degree of practical achievements/actual actions (not simply declarations), number of regular activities (meetings, new agreements, etc.), and plans for future integration, including timescale.

Water Resources Management, which includes a move towards river basin management and the development of a regional water conservation program (ASEAN, 2005). The Bhurban Declaration on Evolving South Asia Fraternity, issued in 2005, recognises that, 'there are major water related problems that need to be addressed on a priority basis with water cooperation among the member countries of SAARC to enhance water and food security' (Bhurban Declaration, 2005). SADC countries have identified water conservation and distribution as one of the principal areas requiring coordinated action.

Indirectly, regional integration arrangements can have significant impacts on both national and regional water management. The link is most obvious in the agricultural sector. A prerequisite for a common agricultural market is that a similar policy regime applies in each national market (Mathews, 2003). The effect of input subsidies (including water) on domestic agricultural production has been discussed above. The effect of subsidies on regional trade is equally significant. Where subsidies are in place, countries make themselves vulnerable to calls of unfair competition and, potentially, to export blockades. For this reason, common rules on the maximum level of allowable subsidies are required to expand market access.

Directly related to the above is the idea of 'virtual water', which has been proposed as an option for reducing inefficiencies within the agricultural sector, and, by extension, stress to the system as a whole. Putting the concept of virtual water into practice is, clearly, dependent on the degree of policy harmonisation across trading countries.

4.7 Monitoring and evaluation

The success of any transboundary water management regime must ultimately be judged according to its impact on national development, welfare, and environmental sustainability, in other words, results that are not instant or easily measurable. However, establishing interim indicators can be used to provide information on whether progress is being made and targets are met in the shorter-term. They do not replace the need for more comprehensive and in-depth evaluations, but can provide a significant degree of information, while being less of a burden in terms of collection and analysis.

In this regard, the approach adopted by the GEF is useful. Its monitoring and evaluation framework focuses on three types of indicators: (i) process indicators, which track the agreed processes (policy, legal, regulatory and institutional reform); (ii) stress reduction indicators, which focus on actual implementation of measures that will reduce stress and are also linked to socio-economic improvements; and (iii) environmental status indicators (Uitto, 2004).

The purpose of these or similar such indicators is to track implementation of agreements on a real-time basis, thereby alerting the relevant parties to any problems or deviations and allowing for remedial action. Equally important, the ready availability to all parties of concrete quantitative and qualitative data on compliance builds mutual trust and a common understanding of the potential constraints and opportunities.

5. Conclusion

The emergence and maintenance of transboundary water management regimes rests on a complex web of inter-related factors that define incentives for cooperation. Fostering cooperative regimes is, essentially, a matter of altering perceptions such that the benefits of cooperation are seen to outweigh those of unilateral action. This is at the heart of the concept of benefit sharing. The difficulty lies not in the conceptualisation, but in the realisation.

It has been the aim of this paper to provide a starting point for operationalising the concept of transboundary benefit sharing. Drawing on experience from a number of river basins, this paper has discussed several practical mechanisms that might foster movement towards cooperation. These include quantifying the benefits and costs of optimal water management, taking care to address equity concerns, and recognising the link between volumetric water allocations and benefit sharing. History shows that a process-oriented approach is the most feasible, that dividing the river basin into sub-units – although in some cases not optimal – is useful in arriving at initial agreement, and that the role of third parties has been instrumental in promoting sharing arrangements.

Recognition of the link between national water policies and transboundary water issues is essential, and actions taken within a country can go a long way to both reducing water stress and improving relations with other riparians. On many different levels, regional integration arrangements can play an important role in fostering cooperative efforts, and, indeed, a number of regional organisations have placed transboundary water management centrally within their agendas. The involvement of all stakeholders is essential to achieving viable solutions, but a balance amongst the various ‘voices’ of these groups must be struck. Finally, monitoring and evaluation, and in particular the use of key indicators to measure short-term progress, is vital as both a learning tool and a consensus builder.

Further attention should be given to a number of areas that are critical for operationalising benefit sharing. The mechanics of institution-building remain a major challenge to benefit-sharing. Additional work is also required in creatively applying existing economic tools to assess potential ‘win-win’ scenarios in transboundary river basin settings and in better linking transboundary benefit sharing with local level impacts (including equity effects). Alternative financing arrangements need to be identified and developed, particularly as the pool of available financing from funding organisations and bilateral donors continues to dwindle. While these areas, amongst others, merit additional attention, this paper has attempted to move the thinking on practical mechanisms for realizing shared benefits forward.

6. References

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