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Water Stress in the Cauvery Basin, South India — How current water management approaches and allocation conflict constrain reform

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Summary
This article presents insights on the state of water management in the Cauvery basin in South India and the ongoing interstate dispute concerning the allocation of the Cauvery's water between the riparian states Karnataka and Tamil Nadu. A lack of multi-level, intersectoral, and participative approaches on the one hand have led to inadequate conditions in water management and water use. On the other hand, the conflict between the two states on water allocation cannot be resolved due to strong reluctance and non-compliance by the states and a highly politicized debate. We identify some clear correlations between inadequate internal water management at the state level and the interstate dispute: the ongoing conflict constraining modernization of the system in the basin is used to justify non-action in irrigation-management reform and ties up state resources as well. Additionally, the current water-management approach does not provide for a mechanism to address the concerns and demands of stakeholders, nor does it promote dialogue between them.

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1 Introduction

The watershed of the Cauvery River, situated in the federal states of Kerala, Karnataka, Tamil Nadu, and the Union Territory of Puducherry in southern India, is a region strongly affected by water stress. Being a "closed" river basin, i.e., a basin in which the water use exceeds the amount of renewable water available, the river's water is heavily used — and much needed. The irrigation of almost 1.2 million hectares of agricultural land (Bohle 2004: 42) in Karnataka and Tamil Nadu requires over 90% of the Cauvery's water, mainly for the cultivation of water-intensive crops, like paddy and sugarcane (Prasad 2007: 47).

Additionally, water demands from other stakeholders and sectors are increasing, namely, the growing urban population of Bangalore and other cities that require water for drinking and household purposes, not to mention industrial users. Being completely dependent on the monsoon for replenishment, the amount of water the

Cauvery can provide to myriads of users varies with the fluctuating strength of the monsoon rainfall. Only in years with a very strong monsoon does the water actually reach the Bay of Bengal (Bohle 2004: 40) — a fact that necessitates the consideration of yet another stakeholder with a profound interest in the water: the environment.

This situation derives from the fact that water policy has so far failed to ensure sustainable management and water use in the basin. Additionally, the Cauvery dispute has to be considered as another dimension related to water management and use in the region. Ever since the river's water began to be utilized on a broader scale in the 19th century, its two main users, Karnataka (or rather, its predecessor the Kingdom of Mysore) as the upper riparian, and Tamil Nadu (the Madras Presidency), the lower riparian, have been involved in a dispute over the amount of water each state is entitled to extract (Anand 2004: 15ff.). The conflict has already led to violent confrontations and a substantial loss of property and life (Babu et al. 2005: 2).

The question arises of how the dispute itself is responsible for this policy failure and how the *mismanagement of water resources* on the one hand and the *ongoing conflict* on the other are interrelated — and form a vicious circle. By investigating the interrelations between inadequate water management within the states in the Cauvery basin and the ongoing water-allocation dispute between those states, this article[1] fills a gap in the existing literature on the Cauvery basin, which so far has mostly dealt with different aspects of the allocation conflict or with water and irrigation management in the region.

In section 2, we assess the state of water management in the Cauvery basin. Coordination deficits in center/state relations, shortcomings in the interplay between the subnational and the local level, and the lack of horizontal integration through fragmented responsibilities and interests are addressed here.

In section 3, the conflict over water allocation between Karnataka and Tamil Nadu is analyzed. The roots of the conflict, the legal mechanism for conflict resolution, and reasons for the latter's failure are assessed, and a brief outlook of the conflict's future is provided.

In the following section, 4, the nexus between the factors analyzed in sections 2 and 3 is described. We identify four specific links by which failure of water management and the failure of conflict resolution are related.

[1] The article is based on research undertaken in India from October to December 2009. Sixteen qualitative interviews were conducted with experts and stakeholders on the central, state, and local level, and three field trips were undertaken in the Cauvery basin. For a complete list of our interview partners, see the Annex.

2 Water and irrigation management in the Cauvery basin — the role of center/state relations

Constitutional aspects and water policy at the central level

According to the Constitution of India, the legislative and executive competencies in water-resources management are primarily located at state level. Listed under Entry 17 of the State List, the federal states have competencies in the field of water supplies, irrigation and canals, drainage and embankments, water storage, and water power. Most of the rivers in India are, however, interstate rivers. This has so far made a holistic view of river systems unfeasible and makes implementation of basin-wide water management difficult (Jaitly 2009: personal interview; Iyer 2003a: 73; Parikh 2009: 2).

Indeed, the development and regulation of interstate rivers is subject to the Union List in Entry 56 of the Constitution and formally equips the central government with significant responsibilities, under the condition that India's Parliament delegates power to the central state level. Due to political reasons, however, this is not taking place. Additionally, the states concerned would have to agree to let the central government regulate their interstate waters, which they generally oppose (Jaitly 2009: personal interview; Iyer 2003a: 23; Vaidyanathan/Jairaj 2009: 3).

A river-basin approach to water-resources management in India is far from being implemented. Full-fledged, stakeholder-based river basin organizations (RBOs) do not exist in the Cauvery basin, or any other Indian river basin for that matter (Jaitly 2009: personal interview; Mohile 2007: 12; Saleth 2004: 16).[2] The central government addressed the installation of basin organizations in the River Boards Act of 1956, but its implementation by the federal states failed to take place — not one river board was set up under the Act. Even though the Act only provided for an advisory role to be taken by the river boards, the federal states were still reluctant to implement these changes (Iyer 2003a: 69; Wood 2007: 63). This fact clearly demonstrates that with regard to implementation, center/state relations in water-resources management are dominated by the union states.

The formulation of the main principles, priorities, and goals of water policy in India is determined at national level. In 2002, the central government revised the National Water Policy (NWP) of 1987, including Integrated Water Resources Management (IWRM) principles — a stronger focus on river basin management, stakeholder participation, and environmental issues, among other matters — in its National Water Policy of 2002 (GoI 2002; Mohile 2007: 11). However, the revised policy has been criticized for its lack of cogency and coherency (Iyer 2003a: 67), and for being

[2] Some river basin organizations do exist in India. However, none of them correspond to the type of RBO that exercises water-management functions, such as those advocated by the IWRM principles.

an "empty, meaningless document," because implementation ultimately depends on will at the state level (Jaitly 2009: personal interview). The NWP 2002 mentions a river-basin approach in water management along with the installation of river boards, but it does not specify any concrete measures — the actual implementation is left to the states (Mohile 2007: 22; Iyer 2003a: 71). As one expert has said,

> "This [the National Water Policy 2002] is not a policy, this is a wish list — a list of good intentions." (Jaitly 2009: personal interview)

As mentioned above, the central government's influence on water and irrigation management is strong in terms of policy formulation, but weak in terms of implementation. This is true of legislation as well as general policy principles. Still, the central government includes a huge number of institutions that work in the water sector. Besides the Ministry of Water Resources, various other ministries each have responsibility for formulating and enforcing certain areas of Indian water policy — mainly the Ministries of Agriculture, of Environment and Forests, of Urban Development, and of Rural Development (Jaitly 2009: personal interview; Saleth 2004: 16). Aside from policy formulation, central government institutions mainly have an impact through the resources they distribute under certain government programs, as Jaitly again states:

> "Basically, they only control resources — money. They distribute money for their own programs to the states." (Jaitly 2009: personal interview)

Implementation at the state level can therefore mainly be enforced by providing guidelines or — more strongly — by attaching certain conditions to programs receiving central government funding. In this way, the central government made it obligatory for the federal states to pass legislation on Participatory Irrigation Management (PIM) in order to receive funds from the *Command Area Development and Water Management (CADWM) Programme* in 2004/2005 (GoI 2005: 16; Sekhar 2007: 55).

Regarding center/state and interstate relations, the National Water Resources Council (NWRC) and the National Water Board (NWB) include members from central government as well as the state governments (Saleth 2004: 16f.). Center/state relations are also influenced by political constellations and interests, however, and therefore depend to a certain degree on which political parties are currently governing at the central level and in the respective states (Jaitly 2009: personal interview).

Problems of vertical water-management coordination from subnational state level to the local level

The riparian states of Karnataka and Tamil Nadu formally adopted the National Water Policy 2002 by setting up their own state water policies. As is the case at the central level, these water policies are documents that summarize the principles,

priorities, and goals of the respective state governments. Thus they strongly refer to the National Water Policy.

The formulation of policy, however, does not mean that all the aspects addressed in those policies are actually implemented through state legislation. Even though both state water policies mention its importance, the concept of a river-basin approach in water management exists only within the administrative borders of the two federal states and is therefore only applied at the sub-basin level within the states. Statements regarding the effective pricing of water, environmental concerns, and stakeholder participation in basin planning can be read in the state water policies, but there is still a large gap in the implementation of these policies (Badiger 2009, Doraiswamy 2009: personal interviews).

The main pieces of legislation in place concerning water and irrigation management at the state level are acts on Participatory Irrigation Management (PIM) that were set up in Karnataka and Tamil Nadu in order to enhance farmers' participation in the operation and maintenance ("O&M") of the irrigation system. In 2000, both states passed legislation according to a model act proposed by the central Ministry of Water Resources. In Karnataka, the existing *Karnataka Irrigation Act 1957* was amended by an ordinance, and the *Tamil Nadu Farmers' Management of Irrigation Systems Act* was passed in Tamil Nadu (Swain/Das 2008: 31). As mentioned earlier, passing an act on PIM was also a condition that states had to meet in order to receive funds from the central government's CADWM scheme. This program included the installation of Water Users' Associations (WUAs) at the local level (GoI 2005: 16). The WUAs were set up to take charge of the management of their local irrigation systems. Water is delivered in bulk to each WUA, which redistributes it among the water users and collects water charges from the individual water users. The implementation of these acts can be seen as an important step forward in water-sector reform in both states. Nevertheless, even a decade after passing legislation, implementation at the local level is far from ideal. The performance of Water Users' Associations is quite limited, which is partly due to insufficient support from the irrigation bureaucracy and a lack of capacity-building measures and incentives (Doraiswamy 2009: personal interview; Swain/Das 2008: 35f.; Sekhar 2007: 55f.). Additionally, WUAs have not been installed throughout the whole Cauvery basin. In Tamil Nadu, in particular, the number of associations in place is quite low (GoI 2008a: 4).

One of the main factors that constrain progress at the state level is the lack of willingness to enact and implement far-reaching reforms of the water and irrigation sector (Badiger 2009: personal interview; Mollinga 2006: 3). For example, the water administration is highly reluctant to relinquish any power to either a higher level, which would be required to install an interstate river basin organization, or to a lower level, which would be required to effectively equip the WUAs with adequate

rights concerning the management, operation, and maintenance of their irrigation systems. This resistance to far-reaching reform has been characteristic of the water and irrigation bureaucracy in India and is present in Tamil Nadu as well as in Karnataka. As a result, the Indian water bureaucracy is sometimes referred to as a "hydrocracy" (Mollinga 2008).

Furthermore, this unwillingness to relinquish any power can also be found among the political parties, as water is a highly political issue in India. When it comes to certain policies, like the pricing or cutting of subsidies, politicians hesitate because of a strong lobby of farmers' interests in Karnataka and an even stronger one in Tamil Nadu. As the biggest share of voters are people who directly depend on agriculture, political parties have not been especially keen on implementing policies that negatively affect this lobby (Badiger 2009, Janakarajan 2009: personal interviews).

Horizontal water-management coordination — the "hydrocracy"

As at the central level, the water administration at the subnational state level is characterized by having a highly fragmented department structure and organization. Various departments and agencies have competencies in different fields of water management, but the necessary horizontal (inter-departmental) coordination is lacking (Raju/Nath 2006: 46; Janakarajan 2006: 299). Competition between the Departments of Water Resources, of Agriculture, and of Revenue and the departments' insistence on maintaining their own traditional competencies still make an integrated policy approach difficult to achieve. As a result of this failure to integrate, the sharing of data between different departments of one and the same federal state is not coordinated particularly well (Raju/Nath 2006: 45f.; Janakarajan 2006: 299). This lack of shared data already presents a huge constraint for effective (sub-)basin planning and management at the state level, not to mention an interstate level covering the whole Cauvery basin.

The introduction of irrigation practices to save water and changing to a less water-intensive cropping pattern are issues that concern both the Water Resources Department and the Agriculture Department. Uncoordinated policy and different priorities in the two departments have led to insufficient measures in this case. While recent policies by the Water Resources Department have sought to improve the economic efficiency of water usage, policies by the Agriculture Department actually promote inefficient water-use practices (Reddy 2009b: 212, 248f.). The pricing of irrigation water and the collection of charges that cover the operation and maintenance costs of the irrigation system have to be coordinated between the Water Resources and the Revenue Department. A major concern here is that the collected charges should not become part of the budget of the Water Resources Department (which is responsible for operation and maintenance), but that of the Revenue Department. This leads to a disconnect between the service delivered and the

charges that are paid for that service, even when these charges do not even come close to covering the full operational cost (Raju/Nath 2006: 35). This practice is found in both Karnataka and Tamil Nadu (Raju/Nath 2006: 46; Janakarajan 2006: 299).

The first steps to achieve better cooperation have already been taken in Karnataka, where the Irrigation Department was incorporated into the Water Resources Department in order to exploit synergies (Raju/Nath 2006: 46). Considerable efforts to improve interdepartmental cooperation at the state level and to provide a setup enabling farmers to participate in irrigation management were made at the central level through the *Command Area Development (CAD) Programme* of 1974/1975 and the subsequent *Command Area Development and Water Management Programme* of 2004/2005 (Saleth 2004: 15). These centrally funded schemes created the administrative units of "Command Areas" within the federal states, with one responsible Command Area Development Authority (CADA) placed in charge of each Command Area. Representatives of the different departments are included in the CADAs in order to implement coordinated water and irrigation policies. The CADAs are an important institutional arrangement for intersectoral coordination regarding implementation. Their impact has been limited so far, however, as the need for better coordination in policy-making at the departmental level still exists (Reddy 2009b: 248). Criticism has also been voiced that "*not enough attention was paid to the farmers' participation per se in the command areas*" (Reddy 2009b: 151).

Besides these institutional aspects, there are certain characteristics within the water bureaucracy that make reform difficult. The great majority of administrative and executive staff are engineers who pursue a techno-economic approach to water-resources management, favoring technological solutions and mostly ignoring environmental concerns. This approach exists in both Karnataka and Tamil Nadu, as stakeholder interviews conducted in both states confirmed. Experts also addressed this attitude in interviews:

> "Most of the government's vision so far has been on the techno-economic solutions. […] It is looked upon as something that technology can fix. For example, if there are problems of water scarcity, they talk of interlinking rivers. […] In that sense, the real practice of sustainable management is completely missing. […] The so-called irrigation bureaucracy doesn't actually look at sustainable use as one of the agendas in the project management." (Badiger 2009: personal interview)

> "They [the engineers] are in control of the whole situation and they are not letting go." (Jaitly 2009: personal interview)

Therefore, the approach to water scarcity in both states is still dominated by a focus on supply-side augmentation rather than demand-side policies (Bhatia et al. 2006: 3; Raju/Nath 2006: 25). Furthermore, water and irrigation management is characterized by a strong hierarchy and a top-down approach. Bottom-up approaches like the par-

ticipation of users, civil society, or NGOs in policy formulation and river-basin planning do not seem to fit into this concept and are therefore not actively promoted. Hence, *"multi-stakeholder institutions are conspicuous by their absence in Indian polity"* (Mollinga 2004: 76).

Impact on the ground

The manifold impacts of the above-mentioned policies and implementation deficits are easily observed on the ground, creating the following problems:

Firstly, the performance of most of the irrigation systems in the Cauvery basin is highly inefficient, as operation and maintenance (O&M) costs are not covered by the low user charges. Furthermore, these charges are not directly spent on O&M, but flow into the general state budget. As a result, the water supply remains unreliable at the local level, in turn reducing users' willingness to pay charges (Raju/Nath 2006: 46).

Secondly, the dominant cropping pattern is very water-intensive, with paddy and sugarcane being the crops cultivated most in the basin (India Water Portal 2010). As a result of subsidies for certain crops and fertilizers, regulated food prices, and low water charges, water-intensive cash-crops are the most attractive option for farmers economically. The irrigation practice is wasteful, as there is no direct incentive to save water and water charges are low and not raised on a volumetric basis. Instead, charges for a whole season are based on the kind of crop cultivated and the size of the land being tilled (Reddy 2009b: 248f.).

Thirdly, people's awareness of and capacity for alternative irrigation practices and alternative crops is rather low at the user level. Efforts at awareness-raising and capacity-building at the local level are mainly made by non-governmental actors and do not receive any active support by the state governments. As Doraiswamy stated in a personal interview held in 2009, the resources for these efforts are limited, and NGOs can only operate in small areas. Nevertheless, this demonstrates that alternative practices do exist and work in the field.

Finally, the performance of Water Users' Associations (WUAs) is still far from ideal. On the one hand, the responsibility for managing the irrigation channels is given to the WUAs, but on the other, the WUAs do not have the right to administer the collected water charges themselves in order to operate and maintain the irrigation system. A study sponsored by the central government states that WUAs in Tamil Nadu have so far worked *"mainly as pressure groups for release of water in adequate quantity to their members from government canals whose operation remained in the hands of the government. These associations did not fix or collect water rates which continued to be the responsibility of the Revenue Department"* (GoI 2001: 218).

3 The Cauvery dispute — attempts and failures at resolving allocation conflict

The dispute over the allocation of the Cauvery River's water is not only the oldest of the several interstate disputes about rivers in India, but also the most complex and contentious of them all. This high level of complexity and tension results from the agricultural and therefore economic importance of the Cauvery River for the two main disputing states, and is also due to social, political, ethnic, and religious factors that go hand in hand with the water-allocation dispute.

The central issue of the dispute is the re-sharing of a river that is already totally utilized, with Tamil Nadu, the lower riparian state, having a much longer tradition of using the Cauvery's waters for irrigation than Karnataka. Thus the rationales of the two states are largely based on two common principles existent in international water law: Karnataka, the upper riparian, refers to the "Harmon Doctrine" and therefore emphasizes its right to utilize the waters flowing through its territory, while Tamil Nadu invokes the "right of prior appropriation," which gives the right to long-term use of water to the first user who puts the water to beneficial use (Iyer 2003a: 45; Guhan 1993: 5, 48).

The crucial point in the dispute is that farmers in both states rely on the same water for their crops from June to September, when the southwest monsoon has fed the river at its source and middle regions, but not at the lower delta region in Tamil Nadu. Thus the timing of Karnataka's release of water at its border with Tamil Nadu is of great importance to the farmers in the delta region. The farmers in Karnataka all grow their only paddy crop of the year at the same time, while the farmers in the delta region traditionally grow their second crop of paddy (*kuruvai*). This second crop is of great social importance, as the landless labor force traditionally gets a share of it (Janakarajan 2009: personal interview).

History of the dispute

The roots of the conflict go back to the end of the 19th century, when the upper riparian area was ruled by the princely state of Mysore and the lower riparian area was under the rule of the Madras Presidency of British India. Over the decades, although negotiations took place and some agreements were reached, the conflict was unable to be resolved.[3] Its long history definitely has to be considered in order to understand the cultural and ethical factors, politicization, and violence involved. The last two decades of the water dispute are of most relevance to the current state of conflict, however. With the constitution of the Cauvery Water Disputes Tribunal in 1990 — based on the Inter-State Water Disputes Act of 1956 — the Cauvery dispute became a matter of national importance (Anand 2004: 19; Iyer 2003a: 40).

[3] See Guhan (1993) for a detailed description of the history of the Cauvery dispute.

The tribunal released an interim order in 1991 in response to a plea by Tamil Nadu for assurance of irrigation waters. This interim award directed Karnataka to release 205 TMCft[4] of water to Tamil Nadu in specified monthly quantities. As Karnataka opposed the interim order, questioning its validity, the central government referred the case to the Supreme Court, which confirmed the order. This led to an outbreak of violence in Karnataka in which 23 people were killed (Frontline 2007: 21). As for the strong opposition, the government of Karnataka did not comply with the interim order, and the central government was unable to ensure its implementation. Due to this non-compliance by Karnataka, the Cauvery River Authority (CRA), composed of the Prime Minister of India as the chairman and the prime ministers of all four states as its members, was set up in 1998. However, even this high-level political body failed to have any major impact on the implementation of the interim order. For this reason, the Supreme Court had to rule again during the drought of 2002 and directed Karnataka to release 0.8 TMCft each day in September and October to save the current crop of *kuruvai* in Tamil Nadu. This again led to outbursts of violence in Karnataka (Iyer 2003a: 44; Pani 2009: 322). At the same time, the states began to declare their final arguments before the tribunal. For various reasons, however, these final arguments were not concluded until April 2006. The concluding judgment of the tribunal was announced in February 2007, and 30 TMCft of water were allocated to Kerala, 270 TMCft to Karnataka, 419 TMCft to Tamil Nadu, and 7 TMCft to Puducherry, based on "normal" precipitation rates (Pani 2009: 322). First Karnataka and then the other parties opposed the final award by seeking clarification and guidelines at the tribunal and simultaneously filing so-called Special Leave Petitions (SLPs) against the tribunal's award at the Supreme Court (GoI 2008b). As the Supreme Court accepted these petitions by the states but has not reached a judgment yet, the Cauvery dispute is still unresolved.

Conflict-resolution mechanism: the Inter-State Water Disputes Act (ISWD) of 1956

The procedures to be followed in the event of interstate water disputes are regulated in Article 262 of the Indian constitution, which empowers Parliament to adjudicate in such cases and also sets a barrier for the jurisdiction of courts, including the Supreme Court. Following this constitutional entry, Parliament enacted the Inter-State Water Disputes Act (ISWD) in 1956, which provides for the installation of a tribunal at the request of any of the disputing states, but only if the central government is of the opinion that the dispute cannot be settled through negotiations. After investigating all relevant aspects in the case, the tribunal submits its final report to the central government. All disputing states as well as the central government can then ask the tribunal for clarification or guidelines about the report

[4] TMCft = thousand million cubic feet.

within a three-month period. Finally, the central government publishes the tribunal's decision in the official gazette, whereupon the decision is binding for all parties — equivalent to a decision made by the Supreme Court (Anand 2004: 15; Guhan 1993: 54).

The example of the Cauvery Tribunal vividly illustrates one of the major problems of the procedure outlined in the ISWD Act of 1956. First of all, and most obviously, the timely delays have to be mentioned that occurred at every stage of the process. As Tamil Nadu and Kerala had already requested the creation of a tribunal in 1970 and Tamil Nadu had repeated this request several times, the central government was still not convinced that all the negotiations to settle the dispute had failed. Eventually, in 1990, the Supreme Court had to force the central government to follow the states' request. Following that decision, it took the tribunal 17 years to grant its final award (Guhan 1993: 55). These procedural delays were one important reason for the 2002 Amendment of the 1956 Inter-State Water Disputes Act, in which certain time limits were prescribed for each procedural stage. These limits are one year for the installation of the tribunal following the request of one state, and three years for the tribunal to give its final award. The tribunal is allowed an optional extension of two years if this is deemed necessary by the central government. Additionally, if a reference is made to the tribunal by the central government or one of the state governments under the ISWD Act, the tribunal has to draw up a further report within a year. As the time limit can be extended indefinitely, however, this amendment could negate all the preceding time savings achieved by the procedure.

The problem of non-compliance — another important issue — was also addressed in the 2002 Amendment by giving a tribunal's final (published) report the same weight as a Supreme Court decision (Iyer 2003a: 34f., Parikh 2009: 8). The problem of a state government failing to comply with a tribunal's judgment does occur, as there are no means of sanctioning the non-implementation of the award. The only possible way to enforce the judgment would be to enable the President's Rule under Article 356 of the Indian Constitution, which would suspend the state's government and put the state under federal rule. Apart from this being a rather extreme measure, it does not prevent the relevant state government from returning to a practice of non-implementation once it has regained power (Iyer 2003a: 31f.).

Failure of conflict resolution

Two different factors concerning the failure of a resolution in the Cauvery dispute can be identified: the procedures of conflict resolution and the socio-political dimension of the conflict. Regarding the procedural dimension, this failure occurs at the legal level, since the existing legal mechanism provided for in the Inter-State Water Disputes Act was unable to produce a solution for the Cauvery dispute despite forty

years of ongoing legal conflict. The time-consuming nature of the procedure will certainly have contributed to a hardening of positions on all sides. Additionally, the lack of acceptance and the lack of any means by which to enforce the tribunal's decisions present major obstacles to resolving the conflict. Karnataka's frequent failure to implement the tribunal's interim order since 1991 strongly indicates that the tribunal possessed little authority right from the beginning. Thus, the Special Leave Petitions (SLPs) that the four parties filed at the Supreme Court once the tribunal had given its final award in 2007 have been harshly criticized along with the Supreme Court's acceptance of these petitions (Iyer 2009, Jaitly 2009: personal interviews); critics state that there is no legal foundation for these SLPs, as the tribunal's final award is binding and beyond the Supreme Court's jurisdiction. Even though its opinion can be challenged, this process has definitely weakened the tribunal's authority further, as well as adding to the delay in finding a final legal solution to the Cauvery dispute (Badiger 2009, Iyer 2009, Jaitly 2009, Saleth 2009: personal interviews).

Additionally, the conflict-resolution mechanism lacks institutional provisions for negotiation before and during the legal arbitration. This has been criticized by some experts; in their opinion, the tribunal has been a barrier to further negotiations. It has also facilitated politicization of the issue on both sides by shifting the focus toward a "win or lose" perspective, which was exploited by party politics in Karnataka as well as in Tamil Nadu (Badiger 2009, Saleth 2009: personal interviews; Doraiswamy/Gaia 2004: 11; Morris 2007: 263).

Concurrently, this argument leads to the political and social dimensions of the Cauvery dispute, in which the major reasons for the failure of a resolution can be found. Due to the fact that farmers are the largest voter group in both states, political parties and movements on both sides have profited from a polarization of the dispute, as they can promise their constituency a bigger share of the Cauvery's water and therefore build up pressure on the respective administrations to take a strong stance on the issue. In addition, a strong regional movement in Karnataka has added an ethnical element to the issue since the 1980s. The movement has used the dispute to agitate against Tamils, which eventually caused violent outbursts to occur in Karnataka in 1991 (Pani, 2009: 323). The highly emotional atmosphere created on both sides by the political polarization seems to be the greatest obstacle to an agreement on equitable sharing of the river (Anand, 2004: 28; Wood, 2007: 76; Badiger 2009, Doraiswamy 2009, Iyer 2009, Jaitly 2009, Janakarajan 2009, Rang Nathan 2009: personal interviews).

The most prominent attempt so far to reverse the political polarization of the issue has been the creation of the "Cauvery Family," a multi-stakeholder dialogue run by scientists and civil-society activists since 2003. Although the attempt has won a good deal of attention and has been fairly successful in creating a mutual understan-

ding among water users from both states, so far its impact has remained low at the political level (Anand, 2004: 32; Frontline 2007; Doraiswamy 2009: personal interview).

The future of the conflict

In view of the lack of political will on both sides, Karnataka's non-acceptance of the final award in 2007 and the consequences this might have for the authority of the tribunal, a solution to the Cauvery dispute seems unlikely in the near future.

Although there is a broad consensus on the scientific level as to what needs to be done regarding equitable apportionment of the Cauvery River and which institutional structures would be necessary to manage the Cauvery basin in a more sustainable way, the present political realities seem to make these ideas impossible to implement.

4 The nexus: interdependencies between internal management and interstate conflict

Most of the existing literature and studies on the Cauvery basin do not address the nexus between the mismanagement of water resources and the ongoing dispute on water allocation. One exception to this is the quite general statement made by Doraiswamy and Muja (2004: 4), who note:

> "Conflicts in no way increase water resources [...] on the contrary, field work reports reveal that the cost of the unresolved Cauvery water impasse is supposedly over Rs. 40 crore." [5]

No further description is included by the authors. Our own field research, however, identified a clear nexus that is evident in four specific links between the ongoing dispute and inadequate water management:

a) The Cauvery dispute is a barrier to the modernization of the physical irrigation system.

b) The dispute further ties up social and financial capital that could be used in other ways.

c) The dispute justifies non-action by government officials and irrigation-department staff.

d) The policy framework does not provide a functioning institutional mechanism to address concerns and resolve conflicts.

The fact that the irrigation systems in both Karnataka and Tamil Nadu are in a bad shape and in dire need of repair and modernization is widely recognized (Sivaraman

[5] "Crore" being the south Asian numeral for ten million; 40 crore = 400 million.

2009: personal interview; Reddy 2009a: 27). Under the Cauvery Tribunal's current award, however, every attempt to modernize necessitates the approval of all four involved parties, as each modernization project could result in an expansion of the irrigated area. This is the case in a community-based tank restoration project in Karnataka, for example, which was cancelled due to objections raised by the government of Tamil Nadu (Doraiswamy/Gujja 2004: 6).

> "The Cauvery dispute has to be settled. Before that, no system improvements or modernization [will take place]." (Ranganathan 2009: personal interview)

Furthermore, the modernization of such an extended irrigation system would require significant financial investments that, in the Indian context, are normally provided by loans from either the central government or international donors like the World Bank. In the Cauvery basin, both of these institutions refuse to sanction loans due to the unresolved dispute. The World Bank has not yet distributed a loan of Rs. 5100 crore (51 billion rupees) dedicated to the modernization of Tamil Nadu's delta system, for example:

> "The World Bank wants the dispute to be solved before they fund the modernization of the delta canal system." (Janakarajan 2009: personal interview)

Projects funded by the central government have *"to satisfy the needs of the Central Water Commission,"* where *"the conflict hinders definitively"* (Asokan 2009: personal interview). Other examples of restoration or modernization projects that have not been implemented due to the unresolved status of the dispute exist in all four states and include the rehabilitation of tanks in Tamil Nadu and the construction of a weir in Kerala (GoTN 2009; Doraiswamy/Gujja 2004: 19). As an inadequate irrigation system has serious repercussions for various aspects of water management in the Cauvery basin, the unresolved dispute is identified as a major factor that is impeding better water management in this region.

Additionally, the dispute ties up financial resources directly and indirectly. Firstly, the conflicting parties employ technical and administrative staff to represent their interests before the tribunal and to provide it with the data required. Secondly, financial resources are spent in the form of opportunity costs, as the states are *"...making moves on their own and fail to exploit possible synergy effects"* (Saleth 2009: personal interview). Furthermore, the data collected is being used to back the individual claims and is not usable as base data for basin-wide planning decisions. Moreover, in Tamil Nadu, and especially in the delta region, the establishment of Water Users' Associations (WUAs) is indirectly hindered by the dispute *"because so many organizations are active here, but all of them are just fighting for their own interests"* (Sivaraman 2009: personal interview). Thus, the tying up of both financial and social capital clearly interferes with some aspects of more efficient water management in the Cauvery basin, such as data integration, financial resources, and the establishment of WUAs.

The uncertainty involved in the pending decision of the tribunal is used, at least unintentionally, by government officials and administrative staff as an excuse for non-action regarding water-management reform, as the following statements demonstrate:

> "First [comes] the allocation between Karnataka and Tamil Nadu, then the allocation within the states, and then the question of managing their own resource." (Jaitly 2009: personal interview)

> "[The] final order by the tribunal has to be accepted, then the states can start using their water more efficiently." (Ranganathan 2009: personal interview)

The unresolved status of the conflict gives government officials an excuse to justify non-action and preserve the status quo, and can therefore be seen as a further factor preventing better water management in the Cauvery basin.

"*Water management, by definition, is conflict management*" (Wolf 2008: 51), and a lack of functioning water-management structures therefore constrains water users from resolving their own disputes and conflicts. This lack, in turn, makes it far easier for politicians to exploit the dispute to their own benefit, as the water users have no institution to address their concern and anger (Jaitly 2009: personal interview). Thus, the inadequate water-management structures in the Cauvery basin clearly have an effect on the status of the easily politicized dispute, which further impedes its resolution.

The question remains as to what extent a more efficient use of water could have a positive impact on the termination of the allocation dispute, seeing as a lower level of demand might ease the level of conflict. Disagreement exists among experts and stakeholders regarding this question, as the following statements demonstrate:

> "If each side uses water more efficiently — yes, of course it would ease the conflict." (Iyer 2009: personal interview)

> "The dispute does not exist because of water or scarcity… increases in efficiency will maybe ease the conflict a little bit, but will not solve it; and in times of scarcity, it will erupt again; efficiency and the conflict are weakly connected; improving efficiency is not enough." (Pani 2009: personal interview)

5 Summary and conclusions

The Cauvery basin is a region characterized by a highly complex range of hydrological, political, socio-economic, historical, and cultural variables that all have an impact on present and future developments of water resources. Water management in the Cauvery basin has not succeeded in meeting existing demands so far and is not likely to do so in the future either in its present condition, especially with regard to the forecasts concerning the impacts of climate change.

This article has pointed out that water policy and management in the Cauvery region lack multi-level, intersectoral, and participative approaches. The constitutional

framework, weak policies, implementation gaps, and a water administration that clings to its own competencies and a techno-economic approach to water management are responsible for the unsatisfactory hydro-political situation in the basin. On the ground, this has led to a situation where irrigation canals are highly inefficient, water-intensive crops are grown without considering any suitable alternatives, water for irrigation is used in an unsustainable manner, and awareness and capacity is low at the local level. Users are patronized rather than perceived as being stakeholders, and even where laws provide for an empowerment of users in Participatory Irrigation Management (PIM), the requisite rights are not transferred.

The interstate dispute on water allocation, mainly between Karnataka and Tamil Nadu, is another factor that determines the hydro-political situation. Even after decades of wrangling, no solution has been found yet to sharing the Cauvery's water. Up until now, conflict resolution has failed due to unsuccessful negotiations, strong reluctance and non-compliance by the states, and a highly politicized debate with outbursts that can even turn violent.

The inadequate management and ongoing dispute are clearly interrelated. So far, the unresolved status of the dispute has made important system modernization in the basin impossible, justified non-action regarding irrigation-management reform in the states, and tied up state resources. On the other hand, the current top-down approach to water management taken in the union states does not provide a mechanism to address the concerns and demands of the stakeholders within the institutional framework, and it does not promote dialogue between any of the interest groups either. As a result, water allocation remains a highly political and confrontational issue where *"each government wants to present itself as the champion of its farmers"* (Iyer 2009: personal interview). As long as the dispute is not resolved by legal means, a committed and pragmatic approach to improving water management in the basin does not seem to be on the water bureaucracy's agenda — and vice versa: as long as the current approach in water policy dominates, resolution of the allocation conflict is constrained. This is the current situation despite the urgent need for a reform process and the fact that some promising policy options to improve water management in the Cauvery basin already exist.

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Annex

Interviewed experts and stakeholders

Experts	Stakeholders
S. Badiger, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore	S. Asokan, Executive Engineer, Cauvery Basin Division, Thanjavur
R. Doraiswamy, South Indian Farmers' Organization for Water Management (Jalaspandana), Bangalore	M. K. Kailashmurthy, natural farmer and activist, Mysore
R. R. Iyer, Centre for Policy Research (CPR), Delhi	A. Mohanakrishnan, Advisor to the Department of Water Resources, Government of Tamil Nadu; Chairman of Cauvery Technical Cell, Chennai
A. Jaitly, The Energy and Resources Institute (TERI), Delhi	S. Ranganathan, Tamil Nadu Cauvery Delta Farmers' Welfare Association, Thanjavur
S. Janakarajan, Madras Institute of Development Studies (MIDS), Chennai	S. Sivaraman, Chief Engineer, Department of Water Resources, Government of Tamil Nadu, Chennai (retired)
R. P. S. Malik, International Water Management Institute (IWMI), Delhi	S. Sridhar, Department of Water Resources, Government of Karnataka, Bangalore
S. Nautiyal and L. Manasi, Institute for Social and Economic Change (ISEC), Bangalore	R. Chawla, Central Water Commission (CWC), Government of India, Delhi
N. Pani, National Institute of Advanced Studies (NIAS), Bangalore	
R. M. Saleth, Madras Institute of Development Studies (MIDS), Chennai	