

Getting Riparian States to Co-operate in Transboundary Groundwater Management: Challenges and Opportunities to Water Security

Akwasi Asamoah, Kwasi Frimpong-Mensah and Charles Antwi-Boasiako

Faculty of Renewable Natural Resources, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, email: asamoah38@yahoo.com

ABSTRACT

Transboundary riparian ecosystems and transboundary groundwater are as interdependent as flora and fauna found anywhere. Nonetheless, conflicts characterize the management of transboundary riparian ecosystems and transboundary groundwater. Conflicts on the obscured groundwater are envisioned to worsen and magnify in the face of increasing water scarcity and global environmental change. To surmount these management conflicts, water experts worldwide suggest several management approaches which can be broadly categorized under co-operative, non-co-operative and myopic ones. Most promisingly sustainable, practical and popular among them is the co-operative management approach which evolves a single comprehensive plan to manage transboundary watersheds. However, there are issues with the co-operative management approach which arise as a result of cultural, political, economic, legal, geographical, technical, historical, and institutional differences from one stakeholder (user or right owner) to the other within and across boundary. Stakeholders may view these issues as challenges or opportunities. But the best way forward is the evolution of a single co-operative transboundary watershed management approach using stakeholders who have learned from success and failure management practices in component riparian ecosystems and are strongly motivated to bring all their experiences to the development of a comprehensive plan which manages transboundary watersheds as a whole.

Key words: watershed, conflict, cooperative, way, forward

1.0 INTRODUCTION

Transboundary riparian ecosystems with its rich flora and fauna are critical to the sustainable management of transboundary groundwater in as much as transboundary groundwater is critical to the sustainable management of transboundary riparian ecosystems. Interdependence of these resources is even more crucial in the face of increasing water scarcity and global environmental change where water experts cannot readily detect initial subtle but somewhat permanent variations in the hydrological and hydraulic cycles (Melvani, 2009 and Wiseman 2009). Characteristics (health status) of transboundary riparian ecosystems are as good an indicator of the quality and quantity of transboundary groundwater.

Nonetheless, the management of transboundary riparian ecosystems and transboundary groundwater are characterized by conflicts. Conflicts on the obscured groundwater are envisioned to worsen and magnify in the face of increasing water scarcity and global environmental change.

Nonetheless, conflicts characterize the management of transboundary riparian ecosystems which are envisioned to worsen and magnify with the obscured transboundary groundwater in the face of increasing water scarcity and global environmental change (Eckstein & Eckstein, 2005 and Matthews, 2005).

To surmount these management conflicts, water experts worldwide suggested several management approaches which can be broadly categorized under co-operative, non-cooperative or myopic ones. Most promisingly sustainable, practical and popular among them is the co-operative management approach which evolves a single comprehensive plan to manage transboundary groundwater (Chermak *et al.* 2005; Rowland, 2005; Feitelson, 2004 and Froukh, 2004).

However, there are issues with the co-operative management approach which arise as a result of cultural, political, economic, legal, geographical, technical, historical, and institutional differences from one stakeholder (user or right owner) to the other within and across boundary. Stakeholders may view these issues as challenges or opportunities

Thus, this paper looks at the challenges and opportunities associated with the co-operative approach for transboundary watershed management. Further, it prescribes the best way forward.

2.0 CHALLENGES

As stakeholders, within and across boundary, take different interest in watershed resources so do they manage them differently in different cultural, political, economic, legal, geographical, technical, historical, and institutional contexts which are challenges and possible precursors to conflict in themselves.

2.1 Cultural

Culture of watershed stakeholders varies within and across boundary (Hassan, 2003). Thus, views of stakeholders on watershed management vary as widely as culture does within and across boundary.

2.2 Political

Needs and wants of watershed stakeholders vary within and across boundary. One stakeholder deciding to dam, reserve water or preserve certain flora and fauna may disadvantage and displease the other (Tamas, 2003). But the two must reach an agreement for their continued survival.

2.3 Economic

Economic circumstance of watershed stakeholders varies within and across boundary. One who is economically stronger will have an edge over the other in the use of watershed resources (Trottier, 2003).

2.4 Legal

Though legal principles are deeply rooted in moral principles, they are difficult to apply and do not always result in practical watershed management (Cosgrove, 2003). International watershed laws have changed with changing nature of international conflicts, but have not changed with ever growing and complicating intra-state conflicts (Lorenz, 2003). As a result, co-operative management approaches are hardly working across riparian states.

2.5 Geographical

Physical environments which surround watershed stakeholders vary within and across boundary. Nonetheless, the type of physical environment that surrounds a stakeholder largely affects the patterns of water flow (Calder, 2002).

2.6 Technical

Data and information about watersheds are scattered and unsystematically synthesized and presented within and across boundary. Map scales and symbols differ from one riparian country to the other. Differences in data collection facilities from one riparian country to the other produces data discrepancies, resulting in inaccurate identification of transboundary aquifers and inconsistent labeling of aquifers (Arnold and Buzás, 2005).

2.7 Historical

History and identity of watershed stakeholders vary within and across boundary. Yet so-called co-operative watershed management plans often ignore historical values and stakeholder identities and

rather accept a lot of scientific models which are incomplete in themselves (Cosgrove, 2003 and Reuss, 2003).

2.8 Institutional

Institutions involved in the management of watersheds have various clear mandates. Yet transboundary riparian countries cannot see the collective effect of these institutions on watershed management. This is so not because of poor institutional organizational structure or the far-fetchedness of international protocols, treaties or conventions to institutions but rather as a result of lack of democracy and good governance; trained human capacity, and financing and developmental support in institutions (Cosgrove, 2003).

3.0 OPPORTUNITIES

Where there is strong will, even the most complex of watershed stakeholdership can turn challenges into co-operation opportunities, and all it only requires is an enabling cultural, political, economic, legal, geographical, technical, historical, and institutional environments.

3.1 Cultural

Stakeholders can certainly share values which encourage judicious use, protection, sharing, equity, and justice of watershed resources within and across boundary. Thus, comprehensive co-operative watershed management approaches should be ones which seek to strongly promote common cultural values among transboundary riparian states. All it only requires are effective methods for exploring, accessing and evaluating cultural values, which are to be integrated into co-operative watershed management plans (Dixon *et al.*, 2001).

3.2 Political

The resolve of stakeholders to agree on all issues of justice and equity in satisfying their needs and wants is all that it takes to arrive at a comprehensive co-operative watershed management plan. It all requires conscientious lobbying, open and hidden negotiations, non-violence, network building, recourse to international organizations, and the actions of elites (Artiga, 2003).

3.3 Economic

How economic edge is managed is very crucial to the success of a co-operative watershed management plan. A stakeholder with an economic edge should always use it to alleviate the poverty of the other(s) in mutually beneficial projects if co-operative watershed management plans are to succeed (Nicol, 2003). For instance, stakeholders that are heavily dependent on the export of primary commodities are more liable to conflict (Tamas, 2003).

3.4 Legal

Stakeholders ought to try their best to make intra-statal by-laws as re-enact-able as possible, so that they can re-adjust co-operative management approaches by the second to address issues on the ground. Intra-statal by-laws may well be customary laws (Lorenz, 2003 and Jennifer Mohamed-Katerere & Zaag, 2003).

3.5 Geographical

A practical co-operative watershed management plan should be one that takes the geographical advantage or disadvantage of stakeholders into consideration. Geographical circumstance of stakeholders should determine justice and equity in watershed management plan based on accurate geographical data (Zainun *et al.*, 2007).

3.6 Technical

Collaboration between stakeholders should lead to the production of accurate data and useful information within and across boundary for cross disciplinary and sectoral consumption (Haddadin, 2003).

3.7 Historical

Stakeholders are more likely to develop a comprehensive co-operative watershed management plan if they share a history of rapport which shows in their every endeavour (Muckleston, 2003 and Frijters & Leentvaar, 2003).

3.8 Institutional

Transboundary riparian governments should revamp their institutions in charge of watersheds management and seek to collaborate to capitalize on institutional strengths and weakness.

4.0 THE WAY FORWARD

The best way forward is the evolution of a single co-operative transboundary watershed management approach using stakeholders who have learned from success and failure management practices in component riparian ecosystems and are strongly motivated to bring all their experiences to the development of a comprehensive plan which manages transboundary watersheds as a whole.

REFERENCES

- Arnold, G.E., and Zs. Buza's. 2005. Economic Commission for Europe Inventory of Transboundary Ground Water in Europe. *Ground Water* 43, no. 5: 669–678.
- Artiga R. 2003. The Case of the Trifinio Plan in the Upper Lempa: Opportunities and Challenges for the Shared Management of Central American Transnational Basins. PCCP Publications, SC-2003/WS/39 p 21.
- Calder, I.R., 2002. Forests and Hydrological Services: Reconciling Public and Science Perceptions. *Land Use and Water Resources Research*. www.luwrr.com
- Chermak, J.M., Patrick R.H., and Brookshire D.S. 2005 Economics of Transboundary Aquifer Management. *Transboundary Ground Water - Vol. 43 Issue 5*. pp 731 – 736.
- Cosgrove, J.W. 2003. Water security and peace – A Synthesis of Studies Prepared under the PCCP-Water for Peace Process. PCCP Publications, SC-2003/WS/39. p 32.
- Dixon, H.J., Doores, J.W., Joshi, L. and Sinclair, F.L. 2001. Agroecological Knowledge Toolkit For Windows: Methodological Guidelines, Computer Software And Manual For AKT5. School of Agricultural and Forest Sciences, University of Wales, Bangor, UK.
- Eckstein, Y. and Eckstein, G. E. 2005. Transboundary Aquifers: Conceptual Models for Development of International Law. *Ground Water* 43(5), 679–690.
- Feitelson, E. 2004. The Upcoming Challenge: Transboundary Management of the Hydraulic Cycle. *Water, Air, & Soil Pollution J. Vol.123, Nos.1-4 / Oct., 2000*. pp 533-549.
- Frijters, I.D and Leentvaar, J. 2003. Rhine Case Study. PCCP Publications, SC-2003/WS/39. p 20.
- Froukh, L. J. 2004. Transboundary Groundwater Resources of the West Bank. *Water Resources Management. J. Vol. 17, No. 3 / June, 2003*. pp 175-182.
- Haddadin, M.J., 2003. Part 1: The Jordan River Basin: Water Conflict and Negotiated Resolution. PCCP Publications, SC-2003/WS/39. p 17.
- Hassan, F.A. 2003. History and Future of Shared Water Resources: Water for Peace: a Cultural Strategy. PCCP Publications, SC-2003/WS/39. p 4.
- Lorenz, F.M., 2003. The Protection of Water Facilities under International law. PCCP Publications, SC-2003/WS/39. p 1.

- Mathews, O.P. 2005. Ground Water Rights, Spatial Variation, and Transboundary Conflicts. *Transboundary Ground Water - Vol. 43 Issue 5*
- Melvani, K. 2009. Role of Forests in the Bioremediation of Water. XIII World Forestry Congress. Buenos Aires, Argentina, 18 – 23 October 2009.
- Mohamed-Katerere, J. and Zaag, P 2003. Untying the “Knot of Silence”: Making Water Policy and Law Responsive to Local Normative Systems. PCCP Publications, SC-2003/WS/39. p 5.
- Nicol, A. 2003. The Nile: Moving beyond Cooperation. PCCP Publications, SC-2003/WS/39. p 20.
- Muckleston, K.W. 2003. International Management in the Columbia River System. PCCP Publications, SC-2003/WS/39. p 15.
- Rowland, M. 2005. A Framework for Resolving the Transboundary Water Allocation Conflict Conundrum. *Transboundary Ground Water - Vol. 43 Issue 5*. pp 700 – 705.
- Reuss M., 2003. Historical Explanation and Water Issues. PCCP Publications, SC-2003/WS/39. p 6.
- Tamas, P. 2003. Water resource scarcity and conflict: Review of applicable indicators and systems of reference. PCCP Publications, SC-2003/WS/39. p 25.
- Trottier J, 2003. The Need for Multiscalar Analyses in the Management of Shared Water Resources. PCCP Publications, SC-2003/WS/39. p 6
- Wiseman, G and Powers, J 2009. Riparian Zone Health Identification Utilizing Remotely Sensed Imagery and Object Orientated Analysis. 2nd World Congress of Agroforestry. ISBN 978-92-9059-255-6.
- Zainun, I., Budidarsono, S., Rinaldi, Y., and Cut Adek, M. 2007. Socio-Economic Aspects of Brackish Water Aquaculture (Tambak) Production In Nanggroe Aceh Darrusalam. ICRAF Working Paper Number 46. Bogor. World Agroforestry Centre – ICRAF