

**THE MANAGEMENT OF INTERNATIONAL WATERCOURSE
SYSTEMS AS REFLECTED BY INTERNATIONAL LAW AND IN
VIEW OF THE SOUTHERN AFRICAN DEVELOPMENT
COMMUNITY**

by

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KEY TERMS

International Water Law
Management of shared water resources
Equitable utilisation
Co-operation
Prohibition against causing harm
Draft Articles of ILC
Political economy of water
'Virtual water'
Global economy
Southern African Development Community

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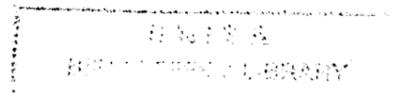
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1. INTRODUCTION

Among developing countries the role that both national and international watercourses can play in the overall scheme of socio-economic development is increasingly becoming an important feature of national development policies and objectives.

The need for international co-operation to manage shared watercourse systems becomes apparent, once it is realised that water is a limited natural resource and that states have limited power as individual entities to preserve and utilise international water resources. Responding to this need, the United Nations and other international organisations¹ have become involved in international water management issues. The adoption in 1966 of the International Law Association's (ILA)

¹ Non-binding instruments were adopted by UNEP, ILC, OECD, ECE and other non-governmental organisations such as the ILA and the IDI.
P. Sands, Freshwater Resources, in *Principles of International Environmental Law: frameworks, standards and implementation*, London: Field, 1995, pp. 346-367.

non-binding Helsinki Rules on the Uses of the Waters of International Rivers marked an important development of international efforts to manage and protect international watercourses.² The 1977 United Nations Water Conference approved a recommendation which states: "In the absence of bilateral and multilateral agreements, member states continue to apply generally accepted principles of international law in the use, development and management of shared water resources".³

There are two relevant fundamental principles of international water law: firstly, that internationally shared water resources are to be used and allocated in a reasonable and equitable manner, and secondly, that one state may not use international waters in such a way as to cause significant harm to another state. These rules are reflected in the draft Articles on the Law of the Non-navigational Uses of International Watercourses, adopted by the International Law Commission (ILC) of the United Nations at its 43rd Session in 1991 and again at its 46th Session in 1994.⁴

However, the question must be asked if fundamental and very general principles of international law can be relied upon to ensure protection and management of shared watercourse systems in a sustainable manner: to provide water in adequate quantity and quality to meet the needs of present and future generations? If they cannot, what techniques can be used to enable the management of international watercourse systems in the 21st Century?

In the draft Articles, the ILC has accepted the principle of equitable utilisation and equitable participation as the legal basis for sharing international water resources. International water law has thus developed to a point where equitable utilisation is accepted, as principle.

² International Law Association, *Helsinki Rules on the Uses of International Waters of International Rivers, Report of the Fifty-second Conference*, Helsinki, 1967.

³ United Nations, General Assembly, *Report of the United Nations Water Conference*, [S.l.], 1977, p. 14025.

⁴ United Nations, International Law Commission, *Draft Articles on the Law of the Non-navigational Uses of International Watercourses*, [S.l.], 1991, 43 Session, supplement A/43/10 and 1994, 46 Session, supplement A/46/10.

However, it will be argued that in order for states to co-operate in the sharing of international water resources, acceptance of the principle of equitable utilisation is not in itself enough. There are certain factors that influence the willingness of states to co-operate on international level. These factors include economic incentives and international relations as well as the domestic water policies. Only once these factors have been taken into account and the incentives they offer have been harnessed and the obstacles they represent have been scaled, are states able to conform to the demands of co-operation for the management of shared watercourse systems. Indeed, the ongoing co-operation necessary to bring about equitable utilisation requires joint watercourse management systems. It is submitted that such joint watercourse management requires knowledge about two kinds of systems - ecological systems as well as systems of human activities such as politics and economics, and the interface between the two.

2. INTERNATIONAL WATER LAW

2.1 THEORIES CONCERNING WATER USE AS THE BASIS FOR CUSTOMARY INTERNATIONAL WATER LAW

Customary international water law, being the product of decades of legal development, is based upon the practices and customs of states.⁵ There are four major theories based on these practices regarding the rights of states sharing a watercourse system.⁶

The traditional theories of absolute territorial sovereignty and absolute territorial integrity are the basis underlying classical international relations among nations. Although neither are widely accepted nor practised today in the international community, discussion of these principles serves to establish the foundation upon which much of contemporary international water law is based. The theory of absolute territorial sovereignty is usually claimed by upper riparian states: this entitles

⁵ G. Eckstein, Application of international water law to transboundary groundwater resources, *Suffolk Transnational Law Review*, 19, 1995, p. 72.

⁶ T. Maluwa, Towards an internationalisation of the Zambezi River Regime: the role of international law in the common management of an international watercourse, *CILSA*, 25, 1992, p. 24.

them to use the international waters within their boundaries as they please and with disregard to the demands and wishes of lower riparians. In response, lower riparians claim absolute territorial integrity, a doctrine which justifies the demand of an undisturbed flow from upstream.⁷ The international community moved gradually towards the more reasonable middle-ground namely the theory of limited territorial sovereignty and integrity. According to Maluwa⁸ this theory seeks to restrict the principle of absolute sovereignty to the extent necessary to ensure to each riparian a reasonable use of the waters of a shared watercourse. It recognises the sovereign right of each state to use and develop the water resources within its national territory to the maximum benefit of itself. This right is, however, limited by the duty not to cause harm to other states with whom the water source is shared. This theory is expressed in terms of the principle of equitable utilisation which is now widely regarded as the basic principle of international water law.⁹

Another theory, that of community of interest, has not yet been widely accepted by the international community, although states have applied it to municipal water systems.¹⁰ This forms the basis for the concept of integrated watercourse systems or river basin development and management. It promotes the unified development of a system without reference to political or geographical boundaries. The watercourse system is then managed for the most beneficial use of the resource. It is submitted that this theory should be used as the basis for integrated and co-ordinated management. It makes provision for a number of factors to be taken into account such as economic development, political relations, *de facto* prior historic use, the quantity of water originating in an upstream territory, alternative water sources available to each partner and the legitimate present and future minimum needs for human survival of each partner sharing the resource regardless of the other factors.¹¹

⁷ Maluwa, *CILSA*, 25, 1992, pp. 24-25.

⁸ *Ibid.*, p. 26.

⁹ J. M. Wenig, *Water and Peace: the past, the present, and the future of the Jordan River watercourse: an international law analysis*, *New York University Journal of International Law and Politics*, 27(2), 1995, p. 345.

¹⁰ Maluwa, *CILSA*, 25, 1992, p. 29.

¹¹ Eckstein, *Suffolk Transnational Law Review*, 19, 1995, pp. 80-81.

2.2 PRINCIPLES OF INTERNATIONAL WATER LAW

A number of efforts (such as those made by the ILA¹²) were made to identify general principles and rules of international water law based on considered state practice, including the adoption and implementation of treaties and other international legal acts, as well as the decisions of international courts and tribunals. Most of these principles are based on the theory of limited territorial sovereignty and integrity. These principles and rules provide a framework to shape the future development of international water law.¹³

International environmental law has developed between two apparently contradicting principles. Firstly that states have sovereign rights over their natural resources, and secondly, that states should not cause damage to the environment of another state.¹⁴ Thus the concept of sovereignty is not absolute, and is subject to a general duty not to cause damage to the environment of other states or

¹² In 1966, the International Law Association (ILA), an international non-governmental organisation founded in 1873, adopted the Helsinki Rules on the Uses of the Waters of International Rivers. This set of Rules was the first attempt by an international organisation to prepare a complete codification of the law of international watercourses. The cornerstone of the Helsinki Rules is the concept of the "international drainage basin". The Rules promote the river basin as the ideal unit to which to apply a legal regime for the management of shared international rivers, because the waters within a drainage basin are interconnected. However, some states rejected the entire concept of the drainage basin. The Rules address the utilisation of, and harm to, water resources. Each basin state is entitled to a reasonable and equitable share of the beneficial use of the waters. The Rules spell out the factors which define what is equitable. At the level of state practice, however, the claim of states to total control of waters within their territories persists. The ILA has produced drafts on a number of topics since 1966 which have continued to develop the Rules through additional resolutions and guidelines to cover other aspects of international water law. The ILA has expanded the scope of the Rules to cover aspects of the biosphere that were not included within the Rules as originally conceived. It has also adopted Non-binding Rules on Water Pollution in an International Drainage Basin and Rules on International Groundwaters. Homann, International Law Association, in *Basic Documents of International Environmental Law*, [S.l.:s.n.], 1, 1992, p. 227.

¹³ Sands, in *Principles of international environmental law 1: frameworks, standards and implementation*, p. 346.

¹⁴ M. V. Soto, General principles of international environmental law, *Journal of International and Comparative Law*, 3(1), 1996, p. 194.

to areas beyond a state's national jurisdiction. This was also accepted in the Rio Declaration of 1992.¹⁵

The ILC intended the draft Articles to supply states with a framework agreement formulating the principles regarding the non-navigational use of international watercourses.¹⁶ The First reading of the draft Articles was in 1991 and the final text was adopted at the Second reading in 1994. The draft Articles provides states with the operative legal principles in international water law.

The draft Articles sets out three main principles as substantive requirements imposed on watercourse states, namely to utilise an international watercourse in an equitable and reasonable manner (Article 5); not to cause significant harm to other watercourse states (Article 7) and to co-operate with each other to attain optimal utilisation and adequate protection of the watercourse (Article 8).¹⁷

- PRINCIPLE OF EQUITABLE UTILISATION

The ILC's Helsinki Rules developed the principle of equitable utilisation to restrict the theories of absolute territorial sovereignty and absolute territorial integrity.¹⁸ The ILC, subsequently, adopted the same principle as compromise between these two theories.¹⁹ The ILC in drafting Article 5 took note of the principle of sovereign equality of states and the principle that states may not use or allow its territory to be used in such a manner as to cause harm to other states. The wording of Article 5 of the draft Articles of the ILC remained the same at the 1991 and 1994 reading. The

¹⁵ United Nations, Conference on Environment and Development, *Convention on the Rio Declaration of Environment and Development*, [S.l.], 1992, Principle 2.

¹⁶ United Nations, General Assembly, *Report of the International Law Commission on the work of its Forty-Sixth Session*, [S.l.], 1994, 49 Session, U.N. Doc. A/49/10(1994), p. 207.

¹⁷ United Nations, International Law Commission, *Draft Articles...*, Article 5, 7, 8.

¹⁸ K. P. Scanlan, *The International Law Commission's first ten draft articles on the law of the non-navigational uses of international watercourses*, *Fordham International Law Journal*, 19, 1996, p. 2206.

¹⁹ United Nations, International Law Commission, *Draft Articles...*, Article 5.

interaction of these principles lead to the concept of equitable and reasonable utilisation of watercourses.²⁰ The special rapporteur of the ILC found that “there is overwhelming support for the doctrine of equitable utilisation as a general and guiding principle of law for the determination of the rights of states in respect of the non-navigational uses of international watercourses”.²¹

The principle of equitable utilisation is not intended to settle divergent claims to international waters *ex post facto* but is concerned with the *a priori* appropriation of water resources. To this end a set of factors has been identified, primarily by the ILC and the ILA in order to facilitate the determination of what an equitable use is.²² The very elasticity of the principle means that a good measure of subjective judgement is involved in its application by any given state. However, because of the “elasticity” of this principle, disagreement as far as the precise formulation exists among international lawyers.

By incorporating this standard into the draft Articles, the ILC appears to use the equitable utilisation principle as an attempt to balance the more traditional principle not to cause harm (Article 7). It appears that the downstream state that first developed its water resources could not prohibit later development by an upstream state by demonstrating that the later development would cause it harm. Under the equitable utilisation principle the fact that the downstream state was first to develop would merely be one factor, to be balanced against the other factors in Article 6 in deriving the equitable allocation of the watercourse.²³

²⁰ G. Eiriksson, The work of the International Law Commission at its 46th Session, *Nordic Journal of International Law*, 64(1), 1995, p. 67.

²¹ United Nations, General Assembly, *Second report of the International Law Commission on the Law of the Non-navigational Uses of International Watercourses*, [S.I.], 38 Session, U.N. Doc. A/CN.4/399, p. 130.

²² These factors refer to the hydrological unity of the river basin, existing and potential uses, cost implications, economic and social conditions in the different states, possibilities of alternative uses and to minimising the harm to other states sharing the same resource, the conservation, protection, development and economy of use.

United Nations, International Law Commission, *Draft Articles...*, Article 6.

²³ D. J. Lazerwitz, The flow of International Water Law: the International Law Commission's Law of the Non-Navigational Uses of International Watercourses, *Indiana University School of Law*, 1(1), 1993, p. 7.

If a state develops a watercourse, it must intent to optimally utilise the watercourse while also guaranteeing that any benefits derived from the watercourse do not negatively affect the sustainability of the watercourse. The ILC indicates that a state is optimally utilising a watercourse when all the watercourse states derive the optimal benefits and fulfilment of their needs from the watercourse, while simultaneously minimising the harm to each watercourse state.²⁴ Concurrent with the realisation of optimal utilisation, states should develop and manage water resources in a manner that respects the many ecological, economic and social issues surrounding water use.²⁵ The principle of equitable utilisation thus levels the playing field and concentrates on factors which are more crucial and less arbitrary, such as the needs of states.²⁶

Paragraph 2 of Article 5²⁷ sets forth the principle of equitable participation. This concept embodies firstly an obligation that states have to participate jointly in the protection and development of a watercourse, and secondly a right that states have to except the co-operation of other watercourse states in matters concerning the watercourse.

One of the most important implications of the principle of equitable utilisation is the fact that its acceptance necessitates the formulation of certain procedural rules regarding co-operation between watercourse states.

- PRINCIPLE OF CO-OPERATION

National interests often prevail when shared resources have to be allocated, when priorities have to be established among different uses and when decisions have to be enforced. The establishment of some form of institutionalised co-operation between the states concerned may become useful or even indispensable. Such an institution's basic objective should be the promotion of the effective

²⁴ United Nations, Report of the ILC's Forty-Sixth Session, p.218.

²⁵ Scanlan, *Fordham International Law Journal*, 19, 1996, p. 2213.

²⁶ Wenig, *New York University Journal of International Law and Politics*, 27(2), 1995, p. 349.

²⁷ United Nations, International Law Commission, *Draft Articles...*, Article 5.

implementation of an international agreement. An example is the International Joint Commission United States-Canada which was established under the 1909 Boundary Waters Treaty concluded between the United States and Great Britain on behalf of Canada.²⁸ It exercises joint jurisdiction over all boundary waters between the USA and Canada.

Co-operation, however, must be established on such principles as good faith,²⁹ good neighbourliness,³⁰ equality and reciprocity, keeping in mind not only national interests, but also those of the basin community as a whole.³¹

Lauterpacht³² stated that the need for international co-operation with regard to water use and exploitation is recognised in the European Charter adopted by the Council of Europe in 1967, which declares that "water knows no frontiers, as a common resource it demands international co-operation".

Numerous institutions or river basin organisations have been established for the harmonious and optimal utilisation and management of shared water resources. Simple institutions such as the

²⁸ P. Sands, Treaty with Great Britain relating to boundary waters between the United States and Canada: 1910, in *Documents in International Environmental Law 2*, London: Field, 1995, Statute 2448.

²⁹ The good faith of states are reflected by the precautionary principle in that states agree to act carefully and with foresight when taking decisions which concern activities that may have a degrading impact on the environment.

³⁰ The principle of good neighbourliness has been translated into the development and application of rules promoting international co-operation. The obligation to co-operate is affirmed in virtually all international environmental agreements of bilateral and regional application such as the UN/ECE Convention on Watercourses adopted in 1992, and in global instruments such as the Rio Declaration. Under this principle no state may engage on its own territory in activities likely to have negative repercussions on the territory of another state.

³¹ A principle applicable here is that of common but differentiated responsibility, which includes two elements. The first concerns the common responsibility of states for the protection of the environment at the national, regional and global levels. The second concerns the need to take account of differing circumstances, particularly in relation to each state's contribution to the creation of a particular environmental problem and its ability to prevent, reduce and control the threat. Soto, *Journal of International and Comparative Law*, 3(1), 1996, p. 205.

³² H. Lauterpacht, *International Law Reports, United Nations Record of International Arbitral Awards*, [S.l.:s.n.], 1957, p. 101.

Egyptian-Sudanese Permanent Joint Technical Committee and the Informal Technical Committee of all Nile Basin States prove to be effective forums for inter-governmental co-operation and co-ordination.³³ However, such institutions lack executive powers needed during difficult circumstances. Although regional organisations have proved more efficient than those operating at a global level, international mechanisms of co-operation have obtained the best results with regard to single specific watercourses or basins.

Regional co-operation is also established through agreements such as the Convention on the Protection and Use of the Transboundary Watercourses and International Lakes that was negotiated under the guidance of the United Nations Economic Commission for Europe (UNECE) and opened for signature in Helsinki on March 17, 1992.³⁴ African states have also adopted a number of important bilateral and regional treaties to protect and manage shared water resources.³⁵

The Economic Commission for Africa and the United Nations Department of Technical Co-operation for Development jointly organised an inter-regional meeting on river and lake basin development, with emphasis on the African region. It was held in Addis Ababa, Ethiopia, in October 1988. Among the recommendations adopted at this meeting, which was attended by

³³ International Environmental Law Digest, *Agreement for the full utilisation of the Nile Waters: Egypt and Sudan*, [S.l.:s.n.], 1959, p. 209.

³⁴ The Convention, which needs 16 ratification's, has not yet entered into force. It commends the efforts already undertaken by the ECE Governments to strengthen co-operation, on bilateral and multilateral levels, for the prevention, control and reduction of transboundary pollution, sustainable water management, conservation of water resources and environmental protection. Under the Convention the parties accept a general obligation to take all appropriate measures to prevent, control and reduce any transboundary impact.

Sweet & Maxwell, *Encyclopaedia of Environmental Law*. [S.l.:s.n.], 1, 1994, p. B633.

³⁵ One example is the Convention Creating the Niger Basin Authority in 1964, which was designed to ensure the integrated development of the Niger Basin. The responsibilities of the Authority extend to environmental control and preservation, including the establishment of norms and measures in the alternative uses of the waters, prevention and reduction of pollution and preservation of human health and genetic resources. A similar institution is the Senegal River Basin Management Organisation that was established in 1972.

representatives of 26 African countries, was the recognition by the governments of the drainage basin concept and the system approach to the management of a river basin's water resources.³⁶

The ILC's draft Articles deal with a general duty to co-operate and certain specific articles deal with specific aspects of co-operation.³⁷ The kinds of co-operation that may be involved include exchange of information, regular consultations, and decisions on issues of standards, monitoring, planning, research and development programs. The Articles try to balance the interest of the states involved with activities which may cause transboundary water pollution, by requiring notification to possible effected states. The obligations to notify and to consult are potentially of great importance in order to limit in individual cases the discretion of states.³⁸ Article 9 demonstrates that the ILC recognised the need for states to exchange data and information to guarantee equitable utilisation of an international watercourse. In cases where such data or information is not readily available, states must employ their best efforts in responding to a request for data.

Wenig³⁹ stated that because the waters of the watercourse constitute by virtue of their physical relationship a unitary whole, efficiency and economy of use cannot be suitably and conclusively analysed without the watercourse state's participation in an examination from a wider perspective, fostering regional co-operation with a view of the optimal utilisation of the watercourse.

It is submitted that equity is measured not simply in terms of the watercourse state's internal measures nor merely in terms of its willingness to participate in regional initiatives. The equity of the utilisation also depends on the corresponding position of the other watercourse states. This includes the political and economical relations of the states. Consequently, the aim of co-operation should be to achieve the optimal utilisation and preservation of an international watercourse.

³⁶ S. C. McCaffrey, *International organizations and the holistic approach to water problems*, *Natural Resources Journal*, 31, 1991, p. 139.

³⁷ United Nations, *International Law Commission, Draft Articles...*, Article 8. The wording of Article 8 remained the same at the 1991 and the 1994 reading.

³⁸ *Ibid.* The 1994 Draft Articles contained additional sections on the period for reply to notification (Article 13(b)) and in times of absence of reply to notification (Article 16(2)).

³⁹ Wenig, *New York University Journal of International Law and Politics*, 27(2), 1995, p. 353.

- PRINCIPLE NOT TO CAUSE HARM

States are undeniably responsible under general international law for acts and omissions concerning activities that take place within their jurisdiction. States must account for any such activities that adversely affect the interests or the rights of other states. International law obligates each state not to cause harm to another state.

This principle is derived from the Roman law maxim *sic utere tuo ut alienum non laedas*: one should not use its property in such a way as to harm others. This is widely considered a general principle of law. Support for this principle in International Water Law is, *inter alia*, to be found in the decision of the Arbitral Tribunal in the 1938/1941 Trail Smelter Case (United States v. Canada).⁴⁰ Article 7 of the ILC's draft Articles also states that "watercourse states shall exercise due diligence to utilise an international watercourse system in such a way as not to cause significant harm to other watercourse states".⁴¹ Support for this principle is also to be found in Principle 3 of the 1978 UNEP Draft Principles of Conduct on Shared Natural Resources.⁴²

There is an apparent conflict between the principle of equitable utilisation and the principle not to cause harm. It is submitted that if the no harm-principle took precedence over that of equitable utilisation the effect would be to freeze the development of many riparian states to international watercourses. McCaffrey⁴³ is, however, of the opinion that the primacy of the no harm-principle means that the fundamental rights and obligations of states with regard to their uses of an international watercourse are more definite and certain than they would have been if governed in the first instance by the more flexible rule of equitable utilisation. However, the ILC recognised

⁴⁰ *Trail Smelter (United States v. Canada)*, *United Nations Report of the International Arbitral Awards*, 3, 1941, p. 1911.

⁴¹ United Nations, International Law Commission, *Draft Articles...*, Article 7.

⁴² J. G. Lammers, *International and European Community Law: aspects of pollution of international watercourses*, *Environmental Protection and International Law*, 1991, p. 115.

⁴³ S. C. McCaffrey, *The law of international watercourses: some recent developments and unanswered questions*, *The Denver Journal of International Law and Policy*, 17, 1988, p. 505.

that in some cases, achievement of equitable utilisation will require some watercourse states to endure a certain degree of harm.⁴⁴

Scholars opposing the no harm-rule have pointed out that the objective should be to avoid the most serious harm, because in cases involving competing uses of shared resources, to avoid harm to one user is to inflict harm on the other.⁴⁵ The obligation not to cause harm to another state offers no protection, in itself, to the ecosystem of the international watercourse in question. That can only be achieved by joint management.⁴⁶

Through Article 7 the ILC explicitly states a standard of care. The 1991-reading of the draft Articles used the words "appreciable harm" while the 1994-reading used the words "significant harm". This refers to effects which are capable of being established by objective evidence and not trivial in nature, but not rising to the level of being "substantial". Article 7 of the 1994-reading also contains subsection 2 requiring states to consult with the state suffering harm. The obligation is characterised as an obligation of conduct rather than result.⁴⁷ The Article calls for consultations in cases where, despite due diligence, significant harm is caused to other states. In such consultations the guiding criteria in balancing interests is the principle of equitable and reasonable utilisation. The possibility of compensation is envisaged in subparagraph (b).

Included in the no harm principle is the doctrine that the polluter must pay for any harm done by its activities. This is essentially an economic policy for allocating the costs of pollution or environmental damage. The practical implications of the polluter-pays principle lie in its allocation of economic obligations in relation to environmentally damaging activities, particularly in relation to liability and the use of economic instruments.

⁴⁴ United Nations, International Law Commission, *Draft Articles...*, Article 7.

⁴⁵ S. C. McCaffrey, *The law of International Watercourses: present problems, future trends*, in *A Law for the Environment*, [S.l.:s.n.], 1994, p. 45..

⁴⁶ S. C. McCaffrey, *The law of international watercourses: ecocide or ecomanagement?*, *Revista Juridica De la Universidad de Puerto Rico*, 59, 1990, p. 1003.

⁴⁷ Eiriksson, *Nordic Journal of International Law*, 64(1), 1995, p.68.

Mawula⁴⁸ stated that the utilisation of rivers or watercourses for industrial and agricultural purposes quite clearly entails some environmental hazards. Problems such as floods and pollution are encountered. Individual states are expected to adopt adequate legislative and administrative provisions to regulate and control transboundary water pollution within their jurisdiction insofar as technically feasible and consistent with the economic condition of the country concerned.

Teclaff⁴⁹ is of the opinion that the International Court of Justice in the Corfu Channel⁵⁰ case supported a more restrictive view of state liability for harm to another state. Indeed, although opinion is not uniform, the prevailing view today would seem to be that there is no general requirement of international law that a state be at fault - in the sense of culpable negligence (*culpa*) or malicious intent (*dolus*) - in order to be internationally responsible. Under this objective theory of responsibility, it is the content of the obligation itself that is crucial. This would leave no room for a state to claim that it had made its best efforts, or had used the best available technology, to prevent transboundary harm.

- PRINCIPLE OF SUSTAINABLE DEVELOPMENT

The general principle that states should ensure the development and use of their natural resources in a manner which is sustainable has emerged only recently.⁵¹ It can be defined as the development that meets the needs of the present generation, without compromising the ability of future generations to meet their own needs.⁵²

⁴⁸ Mawula, *CILSA*, 25, 1992, p. 21.

⁴⁹ L. A. Teclaff, Treaty Practice relating to transboundary flooding, *Natural Resources Journal*, 31, 1991, p. 109.

⁵⁰ Corfu Channel Case, *International Court Of Justice*, 4, 1949, p. 85-86.

⁵¹ United Nations, World Commission on Environment and Development, in *Our Common Future*, [S.l.:s.n.], 1987, no. 8.

⁵² Scanlan, *Fordham International Law Journal*, 19, 1996, p. 2191.

This principle was adopted in the Rio Declaration⁵³ as the main principle for the future management of natural resources. The concept of sustainable development as reflected in international agreements comprises of certain recurring elements, namely: first, the need to take into consideration the needs of present and future generations, secondly the acceptance of limits placed upon the use and exploitation of natural resources, thirdly, the role of equitable principles in the allocation of rights and obligations of states and fourthly, the need to ensure that environmental considerations are integrated into economic and other development plans.

This principle recognises that in a system of differentiated responsibilities developed countries bear a larger responsibility for ensuring sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command. Thus sustainable development is intended to serve not simply the needs of the environment, but entails a much more far-reaching reorientation of the world's economic system.

The Rio Declaration⁵⁴ focused international attention on the adoption of global policies whose explicit purpose was to reconcile economic development with environmental protection. Helpful guidance in the channelling of assistance to all countries to observe their international obligations relating to shared water resources, is provided by Agenda 21, the action plan that was adopted.

The Conference endorsed principles and policies that include the notions that development must be sustainable; that the polluter should bear the cost of pollution; that individuals should have access to effective redress; that environmental measures should not arbitrarily or unjustifiably restrict international trade; and that environmental measures addressing transboundary or global environmental problems should as far as possible be based on international consensus.⁵⁵

⁵³ United Nations, Conference on Environment and Development, *Convention on the Rio Declaration...*, Preamble.

⁵⁴ United Nations, Conference on Environment and Development, *Convention on the Rio Declaration...*, Preamble.

⁵⁵ A. Boyle, Economic growth and protection of the environment: the impact of international law and policy, in *Environmental Regulation and Economic Growth*, [S.l.:s.n.], 1994, p. 96.

Agenda 21's fresh water programme is contained in Section 11 "Conservation and Management of Resources for Development". Water is dealt with in Chapter 18 which contains seven programme areas. However, it only addresses the aspect of transboundary water resources by stating that co-operation between riparian states may be desirable. For transboundary water resources the programme recognises the need for riparian states to formulate water resource strategies and consider the harmonisation of strategies and action programmes. The programme does not call for any international legal action at the global level.

The protection of groundwater is identified as an essential element of water resource management. Agenda 21 recognises the impacts of land use upon watercourses and recommends a catchment or drainage basin approach to water resources protection, management and development.⁵⁶

Although not legally binding, Agenda 21 is important because it will undoubtedly influence the way in which donor organisations and countries allocate funds and thus will largely determine the type of programmes and projects that are undertaken, especially in the developing world.⁵⁷ One of its principle strengths is that it endorses a holistic approach to water management.

2.3 THE APPLICATION OF WATER LAW PRINCIPLES TO THE MANAGEMENT OF SPECIFIC SHARED WATERCOURSE SYSTEMS

Customary principles and rules, as discussed previously and accepted by the ILC, are of sufficient generality as to be applicable to all international drainage basins. The draft Articles of the ILC sets out three main principles as substantive requirements imposed on watercourse states, namely to utilise an international watercourse in an equitable and reasonable manner (Article 5); not to cause

⁵⁶ S. C. McCaffrey, *The Management of water resources, in The Environment after Rio: International Law and Economics*, [S.l.: s.n.], 1994, p. 149.

⁵⁷ The overriding priority needs of developing countries are the achievement of economic growth and the eradication of poverty. The integration of environment and development has re-opened the debate over the 'right to development'. Principle 3 of the Rio Declaration implicitly accepts the 'right to development' of developing countries.

significant harm to other watercourse states (Article 7) and to co-operate with each other to attain optimal utilisation and adequate protection of the watercourse (Article 8).⁵⁸

However, as discussed below, the management of the Nile River and Jordan River Systems show that customary international water law has not been able to translate its doctrines and principles into effective institutions for the management of shared watercourse systems. That task has fallen to diplomats and politicians who have used the principles of politics and economics rather than that of international water law to manage shared watercourses.

- NILE RIVER SYSTEM

The Nile River system, contains ten percent of the freshwater of the continent of Africa and passes through nine different states. Although they are lower riparians, Egypt and Sudan have enjoyed a virtually unlimited and uninterrupted use of the Nile River since the beginning of recorded history.

The first significant agreement concerning the Nile was the 1929 Nile Waters Agreement adopted by Egypt and Great Britain.⁵⁹ The agreement subordinated Sudan's rights to utilise the Nile waters to Egypt's current and future needs.⁶⁰ Allan⁶¹ argues that the agreement between Egypt and Sudan allocates fixed rather than proportional amounts of water, which limits the agreement's ability to

⁵⁸ United Nations, International Law Commission, *Draft Articles...*, Article 5, 7, 8.

⁵⁹ J. A. Allan, *Sharing scarce resources in dryland regions: sharing an international river: the Nile*, *Lecture at the School of Oriental and African Studies: University of London*, 23 January 1996.

⁶⁰ Virtually all the treaties pertaining to the Nile waters were consummated during the colonial period. Since that time many of the areas mentioned in the early treaties have become independent states. Sudan renounced the agreement after its independence in 1956. In 1959 Egypt and Sudan signed the Agreement for the Full Utilisation of the Nile Waters which provided a formula for determining each state's water allocation, established a body to co-ordinate joint development of the Nile and set a formula for sharing the expense of joint development. The secretariat of the Permanent Joint Technical Committee was established to oversee the joint administration. *International Environmental Law Digest, Agreement for the full utilisation of the Nile Waters: Egypt and Sudan*, [S.l.:s.n.], 1959, p. 209.

⁶¹ Allan, *Sharing scarce resources in dryland regions*.

cope with severely diminished river-flows. It does not provide for water quality, minimum river-flow, flood control, or environmental protection of the Nile.

The post-colonial period marked a new beginning for many of the upper riparian states. They announced their opposition to the existing legal regime so favourable to Egypt and Sudan.⁶² At present the Nile riparians interact with one another in a largely *ad hoc* fashion. The practice of the various watercourse states has remained largely unaltered.⁶³

The plans to utilise the waters of the Nile flowing through each of these states, are however controlled largely by the ability of their respective governments to obtain the necessary technology and financial backing from international sources. According to Boutros Boutros Ghali, "even in the best of circumstances, most of the Nile countries, at least for the next two decades, will not be in a position to generate their own capital to finance any project of water storage and management without massive aid from foreign countries and international financial organisations".⁶⁴

Allan⁶⁵ argued that the problem of food supply for the countries of the Nile basin is by no means determined by the availability of water. He is of the opinion that an economic factor which has a major impact on the rate at which food production based on Nile water goes ahead, is the sheer cost of implementing land reclamation. All countries of the Nile basin receive international aid and are substantial debtor economies owing substantial sums to or are deeply involved with the World Bank and the International Monetary Fund. Future agricultural investment on the scale envisaged to meet the food gap requires a commitment to the reclamation of land. That is, however, an

⁶² For example, Ethiopia does not recognise any limitation on its utilisation of the waters originating within its borders and maintains an absolute territorial sovereignty argument.
Allan, *Sharing scarce resources in dryland regions*.

⁶³ D. J. Chenevert, Application of the draft articles on the non-navigational uses of international watercourses to the water disputes involving the Nile River and the Jordan River, *Emory International Law Review*, 6, 1992, pp. 495-575.

⁶⁴ B. B. Ghali, Water management in the Nile valley, in *United States Global Strategy Council*, [S.l.:s.n.], 1990, p. 2.

⁶⁵ Allan, *Sharing scarce resources in dryland regions*.

activity for which the officials of international banks have shown very little enthusiasm and it is very unlikely that capital will be mobilised internationally on the scale required to bring into production the amount of productive irrigated land needed to service the growing food requirements of the Nile basin countries.

I am of the opinion that the optimal utilisation of the Nile River system will only be realised with a basin-wide accord allocating the Nile waters among the watercourse states. However, the greatest hurdle is the political rivalry between the states as well as the diverse economic development. It is therefore clear that the principles of international water law have failed up until now, and are insufficient to be translated into an institution, acceptable to all basin countries for the joint management of the Nile River System.

- JORDAN RIVER SYSTEM

Israel and Jordan, as lower riparians, depend heavily on the Jordan River to meet their water needs. Historic, cultural and religious differences increases the problems caused by the natural scarcity of water in the region. The several communities that share the Jordan valley are already consuming more water than is naturally available to them.⁶⁶ No legal arrangement exists for allocating the water rights of the shared waters by the various Jordan River watercourse states. Israel, Jordan, the West Bank, Syria and Lebanon have each developed their water resources at a different pace. Israel and Jordan have utilised the Jordan river waters to a much greater extent than have their fellow watercourse states.

Chenevert⁶⁷ names two problems in the Jordan River management: the first is Israel's diversion of Jordan river water to the Negev Desert for irrigation, and the second is Israel's diversion of saline water from springs next to the upper reaches of the Jordan River. He is of the opinion that this use by Israel prevents Jordan from exercising its right to equitable and reasonable utilisation.

⁶⁶ J. A. Allan, *Water in the Middle East Peace Process: negotiating resources in the Jordan Basin*, [S.l.:s.n.], 1995, pp. 35-40.

⁶⁷ Chenevert, *Emory International Law Review*, 6, 1992, p. 539.

The main user of water in the Middle East is the agricultural sector. Prices for water for domestic and agricultural sectors are mostly below actual cost because of government subsidies. In many areas in the Middle East there are crops produced at costs much higher than their prices on the international markets. At the same time, they are produced using scarce water resources due to government subsidies to farmers.⁶⁸ Allan⁶⁹ is of the opinion that the region's governments have been able to take a less than urgent approach to managing their water according to international water law principles because there has been extremely cheap water available in a very effective and operational system, namely the world trade in staple grains.

Dellapenna⁷⁰ is of the opinion that in order to create the necessary means for effective management of their shared water resources, and perhaps to import additional water into the Jordan valley, negotiations between countries must create institutions. However, international water law has failed in translating its principles into an effective institution for the shared management of the Jordan River System.

3. EVALUATION OF THE PRINCIPLES OF INTERNATIONAL WATER LAW IN THE MANAGEMENT OF SHARED WATERCOURSE SYSTEMS

Customary international water law provides broad guidance rather than firm substantive rules when applied to specific water management issues. Indeed, because each international watercourse system or river is unique in its geography and its political situation, such universalised legal rules for solving water management issues may not be feasible.

The principles of permanent sovereignty over natural resources, the responsibility to prevent environmental damage, good neighbourliness, and co-operation in relation to environmental protection are well established and rooted in state practice and international instruments. On the

⁶⁸ Allan, *Water in the Middle East Peace Process...*, p. 40.

⁶⁹ *Ibid.*, p.42.

⁷⁰ J. Dellapenna, *Designing the legal structures of water management needed to implement the Israeli-Palestinian Declaration of Principles*, in *Joint management of sharing aquifers*, edited by Haddad & Feitelson, [S.l.:s.n.], 1995, p. 261.

other hand, the duty to compensate for environmental harm although an established principle, is problematic because of the difficulty to assess the environmental damage within the existing liability rules. The principles of preventive action, precautionary and sustainable development are more difficult to uphold, since they are rather new and vague concepts.

It is noted that although neither the Helsinki Rules nor the ILC's draft Articles are legally binding, the principle of equitable utilisation of international rivers has become widely advocated by the international legal community. The examples of state practice discussed above confirm the fact that joint utilisation of international watercourse system on the basis of the principle of equitable utilisation has been accepted and further that effective adherence to the principle of equitable utilisation requires effective institutionalised co-operation. The most important factor in the utilisation of international watercourses today is not to determine who can use the waters, but rather how to reconcile divergent claims in order to obtain maximum benefit and minimum disadvantage to all watercourse states, while at the same time ensuring optimum development of the watercourse system. This may well demand that some countries accept constraints on development that are not in their short-term interest. Equitable utilisation is therefore a principle which levelled the playing field and concentrates more on factors which are crucial and less arbitrary such as the needs of states.

Wenig⁷¹ argues that rather than presenting a formula for determining how much water each state is required to provide or entitled to demand, the principle of equitable utilisation requires each watercourse state to examine the structure of its economy and the direction of its agriculture and water management policy with the aim of putting the water it presently appropriates to the best and most efficient possible use.

The use, administration, and protection of water resources in international relations can be satisfactorily regulated only by specific arrangements establishing some kind of permanent co-operation between the states concerned. Specific arrangements are required because each river basin or system has its own peculiarities; general rules of international law cannot cope with such a

⁷¹ J. M. Wenig, *Water and peace...*, p. 352.

differentiated reality. What international law can do is set the framework according to which minimum international standards can be developed and effective, practical measures applied.⁷² The ILC's draft Articles provides states with such a pragmatic framework for co-operation.⁷³

The draft Articles represent an effort to codify substantive customary principles of international water law and to set out procedural requirements for notification and consultation among watercourse states regarding the use and development of international watercourses. However, the basic obligations of the articles would apply only where there would be an actual or potential effect upon another state sharing the watercourse.⁷⁴ A rather soft approach is adopted by the ILC which only requires states riparian to an international watercourse to enter into consultations concerning the management of the watercourse.⁷⁵

The draft Articles mark an important development by proposing rules of general application globally and thus providing an important starting point and basis upon which many states can further their efforts to achieve co-operative arrangements with their neighbours in the use of shared water resources. However, what the draft Articles does is only to set the framework according to which minimum international standards can be developed and effective, practical measures applied. States co-operation is mostly determined by their political and economical objectives. It is clear that rules establishing general standards and obligations, including those established by customary

⁷² Sands, in *Principles of International Environmental Law 1: frameworks, standards and implementation*, p. 4.

⁷³ United Nations, General Assembly, *Report of International Law Commission of the work of its Forty-sixth session*, p. 207.

⁷⁴ S. C. McCaffrey, The Forty-third session of the International Law Commission, *American Journal of International Law*, 85, 1991, p. 703.

⁷⁵ Ibid. McCaffrey, the special rapporteur to the ILC, explained that "the draft articles set forth general principles and rules which states can apply and adjust through specific watercourse agreements and the needs of states concerned". Visser is, however, of the opinion that the Articles cannot *per se* be seen as rules of public international law. F. Visser, *Public International Law and the joint management of non-maritime water resources*, LL.D. thesis, University of South Africa, Pretoria, 1990, p. 93.

international water law as reflected by the draft Articles, is wholly inadequate to reflect these political and economical objectives.⁷⁶

The numerous treaties indicate that states do co-operate extensively in some areas of the management of international watercourses, but they also show that the co-operation of states is more based on economic and political incentives than the moral weight of the principles of international water law. A real difficulty concerns the political willingness of states to achieve institutionalised co-operation. Le Marquand⁷⁷ lists three types of factors which can influence the decision of states to co-operate: firstly, hydrologic-economic incentives, secondly, international relations and thirdly, the effect of domestic water policies. In a quest to maximise their own well-being, states often overlook the well-being of the watercourse system. Their fragmented and self-centred efforts preclude attainment of the greatest possible good.

As to the ideal type of institution required for international watercourse system management in view of the varying physical, economic, social and political conditions prevalent in each individual basin or system, it is not possible to suggest any particular type of administrative institution. If the willingness to co-operate exists, states must find a way in which to identify the incentives that will support co-operation and to identify the obstacles that might stand in the way of co-operation. There are too many possibilities and alternatives which may be envisaged, and any decision necessarily depends upon, *inter alia*, the functions and activities to be performed and the political will to co-operate.⁷⁸

Water *per se*, does not guarantee development. The effective harnessing of water as a resource by overcoming problems of scarcity (droughts), over-availability (floods) and quality (pollution) as well as its integrated use in any development plan will lead to economic and social growth. It is

⁷⁶ Sands, in *Principles of International Environmental Law 1: frameworks, standards and implementation*, p. 366.

⁷⁷ D. Le Marquand, International river basin cooperation: some factors influencing agreement, in *United Nations river basin development policies and planning*, [S.l.:s.n.], 2, 1976, p. 21.

⁷⁸ D. A. Caponera, International water resources law in general, in *Principles of water law and administration*, [S.l.:s.n.], 1992, p. 183.

evident that the sustainable management of shared water resources cannot be achieved without addressing problems such as the basically agricultural practices and industrial activities. Without effective environmental assessment on a broad scale of these practices and activities, it is unlikely that the shared watercourse systems will be adequately protected and managed. Economic and social growth means that the demand for water will rise, both for consumptive and for in-stream uses. In the effective harnessing of the available water resources to obtain maximum benefits for economic and social growth, three factors are of overriding importance: the harnessing of the political will of the people; the political power of their governments; and the availability of trained and experienced managers. A holistic approach to the management of the shared watercourse is therefore essential. The World Bank proposes the following for the negotiation and co-operation between states: the adoption of a water charter for the region; optimisation of water use in agriculture; and the introduction of economic principles into the allocation and management of water.⁷⁹

Although the ILC's draft Articles have taken a significant step forward in the creation of legal principles for the protection and regulation of international watercourse systems, it does not adequately address such problems as existing uses of rivers; the subordination of the equitable use principle to the no appreciable harm standard; accounting for global climate change; and the provision of financial and technical contributions to under-developed nations.⁸⁰ Furthermore the draft Articles does not apply to groundwater, although a Resolution on Transboundary Confined Groundwater was adopted at the 1994 reading which recommends that the principles and norms applicable to watercourses should also be applied to unrelated confined groundwaters.⁸¹ This absence of a provision on groundwater will negatively impact the escalating conflicts over confined groundwater. This also undermines the aim of the drafters of the draft Articles to create a broad framework for the management of shared watercourse systems.

⁷⁹ Allan, *Water in the Middle East Peace Process*, p. 42.

⁸⁰ Lazerwitz, *Indiana University School of Law*, 1(1), 1993, p. 4.

⁸¹ Scanlan, *Fordham International Law Journal*, 19, 1996, p. 2223.

An additional question that arises is to what extent the draft Articles submitted by the ILC are declaratory of existing customary international law.⁸² Provisions that are declaratory of customary international law are clearly binding on states and create real legal rights and obligations. If the ILC's draft Articles or provisions of any future convention based on these Articles are not declaratory of international law, then states can take the obverse position and claim that these cannot be binding without their ratification or accession. Hey⁸³ argues that changes which are required involves a paradigmatic shift of emphasis from the discretionary role of states to the functional role in international water law. A shift is needed from states being bound by international law only at their own discretion, to states having the responsibility to develop and implement international law in order to further interest of other parties such as future generations. She is of the opinion that the draft Articles emphasises the discretionary role of states and that this could hamper, rather than facilitate, implementation of Chapter 18 of Agenda 21. This is especially true in relation to three objectives which have a prominent place in Chapter 18.⁸⁴ These objectives are: firstly securing access to safe and sufficient water-supplies for all peoples, secondly enhancing public participation and management at the lowest appropriate level and thirdly attaining integrated development and management of water resources. These objectives emphasise the functional role of states. Attaining each of them will require a fundamental modification of the prevailing theory of state sovereignty as reflected in the draft Articles. It can be concluded that fundamental changes are required in the draft Articles if these articles are to facilitate instead of hampering the implementation of Chapter 18 of Agenda 21 of the Rio Declaration.

Another argument against the draft Articles is that of Brunnee and Toope⁸⁵ who are of the opinion that international water law does not adequately promote environmental security because it has

⁸² R. Rahman, The law of the non-navigational uses of international watercourses: dilemma for lower riparians, *Fordham International Law Journal*, 19, 1995, p. 14.

⁸³ E. Hey, Sustainable use of shared water resources: the need for a paradigmatic shift in international watercourses law, in *The peaceful management of transboundary resources*, [S.l.:s.n.], Edited by G.H. Blak & W.J. Hildesley, 1995, p.127.

⁸⁴ United Nations, Conference on Environment and Development, *Convention on the Rio Declaration...*, Preamble.

failed to adopt an ecosystem approach. They are of the opinion that with an ecosystem approach, states co-operation will not so easily resolve into debates over competing national uses or equitable shares. They promote a reorientation of the approach followed by international water law namely to move from a perception that environmental degradation is legally relevant only where sovereign interests of states are affected, toward a framework that also evaluates state conduct according to ecological criteria. The principles upon which an ecosystem approach is based include the concepts of sustainable development, intergenerational equity and precaution. By formulating legal and structural ground rules for shared water agreements the draft Articles of the ILC follows a formalistic lawmaking tradition. Despite the inclusion of principles aimed at the protection of ecosystems of international watercourses, the draft Articles remain grounded in the traditional balancing of competing sovereign interests. Finally, although Article 20 of the draft Articles introduces the ecosystem concept by calling on states to "protect and preserve the ecosystems of international watercourses", the ILC formulated this obligation without providing for matching rights of other states.

I am of the opinion that international water law should facilitate co-operation by states by at least clearly defining the minimum duties resting upon states individually and jointly. However, the prevailing theory of sovereignty reflected in international water law through the draft Articles emphasises the discretionary powers of states. This results in a limited capacity of international water law to impose an obligation upon a state without its consent and a lack of position for actors other than states in international water law. The draft Articles reflect the law as it is and not as it should be. It presents the ILC's best possible compromise between extremely polarised views. The draft Articles establish a basic level of protection allowing the use of watercourses to be fairly assessed in accordance with the principles of equitable and reasonable utilisation and participation, and make it possible to reconcile conflicting interests. However, I am of the opinion that it does not take enough account of the influence and role domestic water policies, international relations and economical objectives play in the management by states of their shared watercourse systems.

⁸⁵ J. Brunnee & S. J. Toope, Environmental security and freshwater resources: ecosystem regime building, *American Journal of International Law*, 91(1), 1997, p. 26.

4. ADDITIONAL ASPECTS THAT SHOULD BE TAKEN INTO ACCOUNT IN THE MANAGEMENT OF SHARED WATERCOURSE SYSTEMS WITH SPECIFIC REFERENCE TO SADC

It will be argued that the main reason why it has been difficult to establish legal arrangements with respect to the sharing and management of shared water resources, is the diverse economic and political relations between riparian states. I am of the opinion that the assumption that underlying resource and economic circumstances of riparians are sufficiently uniform for states to agree on an international legal regime based on common principles, is wrong. I am further of the opinion that the hydrology of a river basin or shared watercourse system cannot alone determine the inter-state relations of riparians. For that reason hydrological systems are a poor foundation for the principles of international water law as reflected by the ILC's draft Articles. Aspects of the political economy of water should also be taken into account.

4.1 THE POLITICAL ECONOMY OF WATER

Hydrological systems appear to be very relevant to relations between states which are in competition over water. However, as a result of this wide appeal on hydrological systems and their assumed importance, it has taken many years to identify the reasons for their poor explanatory role in the real world of international water management. It has been especially difficult to explain their poor record in providing a convincing basis for co-operative action and legal agreements on shared watercourse systems. Allan⁶⁶ argues that the management of shared watercourse systems on hydrological data by national governments of the Middle East are subordinate to the national and international political economies of which they are part. He states that economic and political relations have proved to be rich in the provision of alternative solutions for access to water. He emphasises that as economies 'develop' they gain in diversity and strength which in turn makes it possible to pursue new and more efficient water allocating options, including

⁶⁶ J. A. Allan, Water use and development in arid regions: environment, economic development and water resource politics and policy, *Water use and Development*, 5(2), 1996, p. 109.

the adoption of demand management policies and practices. By reducing the pressure on water resources, such policies diminish the urgency to co-operate and negotiate over water.

There are two sets of economic concepts which help explain why the sharing of water does not tend to rest on ideas based on hydrological systems⁸⁷: these are the concepts of water use efficiency⁸⁸ - productive and allocative efficiency and the concept of 'virtual water'.⁸⁹

Changes in the hydrological systems takes place which are not timely reflected by the principles of international water law. An example is global climate change: hydrological data strongly suggest that temperature rises due to global climate change will change the distribution of rainfall and thus reduce the water supplies.⁹⁰ Any increase in precipitation will have an impact on the projected change in soil moisture and changes in runoff. While short-term impacts due to weather variability can be accommodated through temporary measures, climate-related changes might necessitate overall adjustments in water management arrangements. Adequate and flexible institutional arrangements will then have to be in place for managing shared water. However, fixed water

⁸⁷ Allan, *Sharing scarce resources in dryland regions*.

⁸⁸ The price of water fails to include many of the most important costs of its use. As a result, water is used inefficiently. Enormous improvements in the efficiency of water use are possible. New Water efficient technologies are now available for the residential and commercial sectors. Crop choices can be reconsidered to more closely match water and soil conditions, rather than crop export requirements. The productive efficient utilisation of water, can be improved by adopting technology for example, sprinkler or drip irrigation systems rather than for instance flood irrigation. Allocation of water to crops which use water more effectively is another means of improving water use efficiency. Until water is priced at its real value, there will be few incentives for wise and efficient water use. Pricing water according to its scarcity value, holds promise for moving towards a better allocation and more efficient use of water as a scarce resource.

P. H. Gliel, *Water in the 21st Century*, in *Water in crisis - a guide to the world's fresh resources*, [S.l.:s.n.], 1993, p. 105.

⁸⁹ It is an established economic principle that when those managing resources recognise that they fall short of a particular factor of production they substitute a plentiful factor for a deficient factor, for example capital for labour. In the case of scarce water this principle can be applied by importing "virtual water" combined in, for example grain. Allan argues that "it is easier and more efficient to move a tonne of grain than the 1000 tonnes of water required to produce it".

Allan, *Water use and Development...*, p. 108.

⁹⁰ J. Winpenny, *The water problem*, in *Managing water as an economic resource*, London: Routledge, 1994, p. 1.

allocations in treaties may pose problems if the flow of a river undergoes change. Water allocations will have to be redetermined. The amendment of legal and institutional arrangements may take time to adjust to these new circumstances.

Waterbury⁹¹ is of the opinion that the draft Articles of the ILC appear to be soundly based on principles of hydrology and environmental science. He argues that the view of international lawyers to see the boundaries of the catchment and the resulting flows as a basis for legal regimes that evolve in a particular catchment, is a misconception. I am of the opinion that while hydrology is a sensible starting point in terms of understanding the physical system, it is only a minor element in the international political economies that influence the management of shared watercourse systems.

The economical and political objectives of states have a great influence on the management of shared water resources. Water resource allocation and management options differ greatly according to the diversity and the strength of an economy. Diverse and strong economies have options which are not available to economies which lack diversity and are heavily dependent on agriculture often irrigated and water intensive productions. Perceptions of water management can shift dramatically as a result of transformed economic circumstances.⁹² One of these circumstances is the global trade in food.

⁹¹ J. Waterbury, *Transboundary water and the challenges of international co-operation in the Middle-East*, in *Water in the Arab World*, P. Rogers & P. Lydon, Cambridge: University Press, 1994, p. 39.

⁹² One example is that of Israel: it had developed by 1986 a political economy of economic diversity and strength which enabled a re-evaluation of the role of water in the economy. The challenge for the Israeli government was to achieve the co-operation of those with legal rights to use and or extract water to maintain a secure, but lower level of water supply, than in the past. The cautious application of water pricing instruments accommodated those sectors which had to make the most painful adjustments. The other productive sectors, industry and services, were at the same time steered to continue their stringently economical approach to water use by strong regulation and water charging measures. Therefore as the economy of Israel developed it had options which were not available when it lacked diversity and strength.

J. A. Allan & M. Karshenas, *Water, Peace and the Middle East*, London: Tauris Academic Publications, 1996, p. 126.

4.2 THE 'VIRTUAL WATER' CONCEPT

Staple grains are traded on a daily basis in the global trade markets. Water traded indirectly in this staple grain is called 'virtual water'. Allan⁹³ is of the opinion that the availability of 'virtual water' on the world market for staple grains has enabled political leaders to provide water for their economies without having to address the problems associated with co-operating with other riparians over shared watercourse systems. The availability of 'virtual water' in the operational global trading system is of great importance to the economies of water deficit countries. Such water enables them to meet their national water needs and to ensure food for their peoples. The stronger an economy of a state, the more it can secure its participation in this global trade of 'virtual water'. Therefore it should be a priority of states to understand the nature of globalized agriculture, as well as their own economy's role in international trade in order to manage water resources. This also applies to regional co-operation and management of shared water resources that should take into account the regional trade in staple grains.

Allan⁹⁴ uses the Nile and Jordan River Systems to prove his argument for the 'virtual water' concept. He argues that in both the Nile and the Jordan basins any agreements on water sharing would not have enabled food self-sufficiency, since Egypt, Jordan, Israel and Palestine are all food and therefore 'virtual water' importers. He sees Egypt as an extreme example of the genre. In practice Egypt has met its rapidly rising water deficit since the early 1970's by importing 'virtual water' in food financed by its own increasingly industrialised economy as well as by international assistance.

Developing economies do not enjoy the options of more diverse and stronger economies and this severely constrain their policies and practices with respect to water allocation. The high levels of economic interdependence that exist between many parts of the global economy raise fundamental questions concerning the distribution of wealth, power and resources between industrialised countries and developing countries. Certain international organisations influences states

⁹³ Allan, *Water use and development...*, p. 108.

⁹⁴ *Ibid.*, p. 113.

management of shared water resources, because it can determine the flows of economic assistance on which such states are dependent, in some cases for periodic emergency relief and in all cases for development spending.⁹⁵ The developing countries lack the institutional framework and technical skills to participate in a global trade. Support for new institutional capacity in developing countries may be the most useful form of assistance from organisations such as the World Bank and other aid agencies. The organisations that matter most are not specifically environmental, but rather are the core institutions that govern the workings of the world economy: such institutions as the World Bank, the World Trade Organisation (WTO) and the Group of Seven.

The global economy of the past has been favourable to water deficient economies and developing countries which imported subsidised staple grains. However, with one of the aims of the WTO being to minimise subsidies for agricultural products, prices may increase. As a result the supply of cheap and secure 'virtual' water may not be so readily available in future for developing countries. A number of factors exist in the global production and trade of food staples that will have an influence on the global economy and the possibilities for water deficit and developing countries.⁹⁶

Out of the above-mentioned discussions, I am of the opinion that the principles of international water law as reflected by the draft Articles of the ILC, is insufficient to manage the shared water

⁹⁵ The approach of the international community to the allocation and use of water changed significantly in the early 1990's by encouraging the adoption of demand management policies. Water demand management is intended to optimise the allocation of the supplies available at any time to the various competing consumptive and non-consumptive user groups. Allocations must be based on priority criteria derived from scientific, economic and socio-economic studies.

⁹⁶ I am of the opinion that some of these factors are the following:

- the influence of climate change on precipitation and thus on the global hydrological system,
- the demographic trends in China and South Asia, which together include 40% of the world's population: whether they remain absent from the global cereal market or enter the market as food importers is of global significance,
- impact of WTO agreements and regulatory measures not only on the price and availability of food but also on linked agreements relating to commodities and manufactures of importance to the future development of poor and water deficit economies,
- food production and environmental policies of major food surplus producing economies in the industrialised countries and the potential of the western republics of the former Soviet Union,
- technological developments which could transform the delivery of fresh water derived from saline and polluted water can also influence the global economy.

resources between states. The domestic water policies as well as the economical and political objectives of the states should also be taken into account. The developments in the global economy and specifically the potential of states to import 'virtual water' through the trade of staple grains will have a significant impact on states approach to their management of shared watercourse systems. I am further of the opinion that this is also applicable to the Southern African Region.

4.3 WATER MANAGEMENT IN THE SOUTHERN AFRICAN REGION

In most of the Southern African Development Community (SADC) countries, irrigation is currently by far the largest consumer of water. Although agricultural livelihoods are important, water in agriculture produce have low value outputs in monetary terms. At the SADC Conference on 23-24 November 1995 the immediate need for the determination of a strategy to ensure water resource management was emphasised.⁹⁷ The management and development of water resources have been fragmented across the region. The Conference emphasised that population pressure is probably the greatest contributing factor inhibiting sustainable socio-economic development in the region and presents a major challenge to water resource management.

The Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC) Region has been signed by most of the SADC member states.⁹⁸ The Protocol recognises the concepts of environmentally sound management, sustainable development and equitable utilisation of shared watercourse systems in the SADC region, bearing in mind the Helsinki Rules; the draft Articles of the ILC and Agenda 21 of the Rio Conference. The Community's aim with the Protocol is to develop close co-operation for judicious and co-ordinated utilisation of the resources of the shared watercourse systems in the SADC region. Member states undertake to respect and apply the existing rules of general or customary international law and to abide by the principles of community of interests in the equitable utilisation of shared watercourse systems and related

⁹⁷ Southern African Development Community, *Report on the SADC Water Conference*, [S.l.:s.n.], 1995, pp. 1-25.

⁹⁸ Southern African Development Community, *Protocol on Shared Watercourse Systems in the Southern African Development Community Region*, [S.l.:s.n.], 1995, Preamble.

resources. The Protocol is mainly based on the principles of the draft Articles of the ILC. It is therefore recommended that specific arrangements for the effective management of the different watercourse systems should be established by the countries of the SADC Protocol. The ILC's draft Articles provide a broad guidance as a foundation for co-operation: however, a holistic approach that takes into account the political economy of water is recommended.

It is submitted that a most effective way for Southern Africa to access more water is through the importation of more commodities which relies heavily on water for their production (water intensive commodities). Applying the principle of equitable utilisation across the Southern African region, it would be in the interest of South Africa as a semi-arid territory to encourage water intensive activities such as irrigation, afforestation and hydro-power generation in the well-watered countries to the north such as Angola. By importing such commodities, the water destined for their production within South Africa can be allocated to other higher-value purposes. Such a policy should strengthen the economies of the other countries and create greater regional prosperity. Water use can best be optimised in an overall regional plan for water management based on regional economic development. I am of the opinion that the regional states should also take into account the political economies of water which includes the potential for regional trade in staple grains and other water intensive commodities.

5. CONCLUSION

The arid lands of the world will be subjected to ever greater pressure on their land as a result of the continued growth of their population. Important factors would seem to be the wealth of a nation, its political system, and the relative importance of water in the overall economy of the country.

It is submitted here that efficient and effective management of the shared watercourse systems of Africa and specifically the Southern African Region holds a critical key to the resolution of the current economic problems.

An understanding of the institutions which allocate and manage water is essential in any consideration of water resource management. To ensure that water is efficiently managed regional organisations for the shared watercourse systems must be negotiated and established by the countries. It is recommended that these organisations must be equipped with the best available technology to interpret the workings of the entire hydrological cycle and are supported by a sound legal and fiscal framework to ensure that water is allocated at the maximum collective benefit. The principles of international water law as reflected in the draft Articles of the ILC can be used by states as basis for their co-operation. However, sustainable development as accepted in the Rio Declaration should also be used as principle. It is also recommended that other aspects of the political economy of water should be taken into account, because legal principles alone could not shape the relationships between water users.

The shared watercourse system needs to be viewed as a whole for co-operation planning, policy-making and investment purposes. The traditional compartmentalised approach, reflected, for instance, in separate agencies for irrigation, municipal supply and pollution control encourages the sub-optimal use of scarce water and a failure to recognise externalities in water use such as economical factors. It will, however, become increasingly important for policy-makers, regulators, utility managers and others to take a holistic view of water management to avoid the waste and conflicts that arise from uncoordinated behaviour as well as to optimise the economic development of countries of shared watercourse systems.

Economic circumstances have influenced the policies on water allocation and sharing of water. Legal regimes should be flexible to make provision for changes in countries' economic and political objectives. It is not argued here that there should not be widely recognised and legally enforceable rules for the sharing of water resources, merely that there are much more practical and operational remedies in real international political economies. It is to these remedies that governments in water stressed political economies normally resort. One is the trade in 'virtual water' through the importation of staple grain. It is recommended that international organisations such as the ILC and other specialists in water law should develop institutions and procedures which facilitate and stabilise the global trade in water intensive commodities such as staple grains to secure the trade in 'virtual water' to the benefit of countries faced with water deficits and other developing countries.

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