



Stream at Beramulla

Photo by Chamali Liyanage

justice for water

january 2011

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Photo by Chamali Liyanage

Foreword

United Nations General Assembly declared that access to clean water and sanitation is a fundamental human right in July 2010. The big question how do you translate this to the local realities.

Water is the most precious natural resource on the earth. Water is a matter for couple of wars and some local civil wars. Yet people don't give its due respect to the water. Water pollution is caused by the human activities from urban to the rural communities to the rich people to the poor, to the industrialist to the farmers. Most people forget water comes in a cycle and it includes rains, forest, river catchments, lakes, rivers, canals and oceans when the water come out of the tap.

As we found some water bodies contain heavy metals such as lead, mercury, cadmium and chromium. They have very high levels of coli form levels. Human excreta often go into these canals. Unidentified Kidney Disease in Anuradhapura, Polonnaruwa, Padaviya, Sri Pura, Minneriya, Hingurakgoda, Dehiattakandiya in the North- Central Province and some parts of the the Eastern Province has already affected more than 100,000 people.

Hundreds of conferences happen on the earth annually to discuss water rights, water pollution, water services and water regulations. Dozens of laws are available in each country to regulate water allocation, combat water pollution and protect individual's water rights.

Most canals, rivers and lakes in Sri Lanka also heavily polluted and can be seen as dirty waters. They can be easily cleaned if the existing laws are properly enforced. Canals and rivers have become the dumping grounds. All liquid effluent finally ends of in the city canal system. Canals are blocked and they have become mosquito breeding grounds. The river reservations and the water bodies throughout the country have encroached by both rich and poor. There are hundreds of reasons you can hear if you ask why they have encroached.

Public interest groups such as Centre for Environmental Justice can do very little but most actions left to the public sector. Government agencies especially local authorities can easily tackle this issue with a good corporation among the agencies and public. Cleaning canals and water bodies is rather expensive than law enforcement.

I thanks the CEJ team involve in monitoring the heavy metals in the water bodies. I thank the co-authors and the research team for their extensive work. I do hope that anyone reading this report will be an active agent of mobilizing the other for protecting water bodies for our future generations.

Hemantha Withanage

Executive Director
Centre for Environmental Justice/ Friends of the Earth International

Wennappuwa

15th January 2011

Executive Summary

Water pollution is very evident in the city of Colombo and all other urban centers in Sri Lanka. Domestic, Industrial waste or agricultural waste and agrochemicals responsible for such pollution. Cadmium in the North central Province is a famous issue which affects the people through the drinking water. But there are number of other non-famous cases.

The research carried out by the Centre for Environmental Justice found high concentration of lead in some water bodies. Although people don't consume this water for drinking purposes, some of this water flows to rivers which use for bathing purposes.

In general the canals and the water bodies in the city of Colombo are cleaner than a decade before. Yet encroachments of the water bodies, catchments and marshes including paddy fields are very visible in the cities as well as in the rural areas. Filing of paddy field cause a major problem to the water.

This legal research found that there are number of laws and regulations to control and regulate the water pollution, encroachments and destruction of the catchments. Yet we found that implementation of these regulations and coordination among the agencies is responsible for many water injustices.

Chapter IV of the report provide some recommendations which is mainly for the public agencies to follow for the safeguard of water and to ensure water as a human right as declared by the UN general Assembly in 2010.

Chapter 1

Introduction

What is water?

Water is one of the most essential requirements for life. Being water in its liquid form governs the establishment of life on earth. Metabolic activities of living organisms take place inside cells which contains more than 60% of water.

Though water is the most abundant compound on the earth's surface which is about 70% of the planet, the amount of utilizable water is very little. Fresh water fit for human consumption is called drinking or potable water. Only a small portion of water present in the earth can be used by living beings.

Human civilization, migratory pathways and settlements were influenced by the availability of water and the availability of water determines the activities of living organisms.

Cycling of water via evaporation, transpiration, precipitation, sweeps, runoffs and flowing create the balance and stability of earth. The simplest answer of the purpose of water is for drinking which describes the existence of biota.

More than 70% of the water in the world is used for agricultural purposes. Water is mostly essential for hygiene and many other cultural and social aspects. For industries, water is used for a wide range of applications such as power generation, as a solvent, machinery purposes etc.

Water resources in Sri Lanka

Sri Lanka is endowed with rich water resources originating from the central highlands that receive rain during the monsoons.

The total volume of fresh water received annually is 13,230 million m³ and the average annual river flow is 40,680 million m³. There are 103 river basins which cover 90% of the island and 309 major irrigation reservoirs and nearly 18000 minor reservoirs.

The estimated ground water potential of the country is 780,000 hectare meters per annum. Rainfall is the

Johannesburg Plan of Implementation IV. Protecting and managing the natural resource base of economic and social development

24. Human activities are having an increasing impact on the integrity of ecosystems that provide essential resources and services for human well-being and economic activities. Managing the natural resources base in a sustainable and integrated manner is essential for sustainable development. In this regard, to reverse the current trend in natural resource degradation as soon as possible, it is necessary to implement strategies which should include targets adopted at the national and, where appropriate, regional levels to protect ecosystems and to achieve integrated management of land, water and living resources, while strengthening regional, national and local capacities. This would include actions at all levels as set out below.



primary source of groundwater. Its contribution to the groundwater recharge is estimated to be 7-30% (Anon 2000), or 200 - 600 mm/year.

The Mahaweli is the longest river draining 16% of the country and carries water from the wet zone to the dry zone. Inland waters include manmade lakes and ponds and marshes, constituting one of the highest densities in the world. The area under water bodies covers 2905 sq. km. or 4.43% of the total land area.

There are several aquifers with substantial groundwater resources in the limestone area in the north and west of the Island. The Vanathavillu basin in the Northwest is a major aquifer with the highest potential spreading over 40 km² with a water potential 5-20 million m³/year.

Canal system in Colombo is a marvel about few decades ago. It includes natural canals as well as manmade canals built during kings period and by the dutch and british colonial rulers for different reasons. They include Kalani Ganga, Baira lake, San Sebastian canal (which connect Beira lake and Kelani river), Dematagoda Ela, Orugodawatta Ela, Kotte Ela, Kirulapona Ela, Wellawatta Ela, Dehiwala Ela, Bolgoda Ela(connect Dehiwal Ela and Werasingha Ganga), Werasingha Ganga, Panadura Ganga, Diyawanna Oya and Lunawa Lagoon.

All these canals and water bodies are heavily polluted except Diyawanna Oya which is comparatively free from pollution. There were number of project in Lunawa Lagoon and Beira lake. Lunawa lake is a better water body than how it was 2 decades ago. Yet polluted water freely flows to Lunawa lagoon as well as all other water bodies.

Water as a right

Water must be in accessible and safe form for its users. Consumption of unsafe water creates serious health hazards such as diarrhoea, especially in developing countries, and annually kills over 2 million people worldwide.

Worldwide, more than one billion people lack access to potable water, and more than two billion do not have adequate sanitation. As a result, over 3 billion people (mostly children under age 5) suffer from waterborne diseases that can be fatal.

According to the WHO, at least 1.1 billion people worldwide do not have access to safe drinking water sources and every year more than 1.8 million people die of diseases such as cholera. This directly affects the health of the people which governs development, education and poverty too. Only 81% of people in South Asia have access to improved drinking water. In Sri Lanka 77% people enjoy access to improved drinking water exceeding the MDG targets.

Access to safe drinking water is a human right. The UN General Assembly declared access to clean water and sanitation a "fundamental human right" in July 2010.

The National Water Supply and Drainage Board (NWSDB 1993), statistics reveal that about 300,000 persons in the Greater Colombo area live in slums which lack basic utilities such as safe water and toilet facilities.

Water resource is under great pressure due to the increased human population and mismanaged activities.



Water pollution

One of the common topics that people mention when addressing water is its pollution. Pollution simply means any change in quality of water that adversely affects the biota or making it unsuitable for consumption. Among most threats caused to natural resources by mankind, pollution of water is also largely done intentionally or unintentionally by the people. Also this is among the leading causes of deaths and diseases of the world.

The major intentional pressures on water resources are agriculture, urbanization and industrialization that change land use patterns. Excessive use of agrochemicals and chemical fertilizers, release of industrial effluents, domestic waste and sewage and dumping of solid waste into waterways cause unintentional pressures. These pressures collectively interact resulting in complex impacts on water resources which make water unsuitable for human consumption.

Discharge of effluents both domestic and industrial is one of the causes for pollution in urbanized as well as rural areas. Direct discharging of sewage to water sources can be found all over.

Most waterways found in Sri Lanka are polluted to certain degrees and some very highly. Dying of fish in waterways has become a common phenomenon and Kandy Lake is a common example for this.

The Kelani River runs through densely populated areas and receives much organic pollution in the last 50 km stretch due to the discharge of untreated faecal matter. It is estimated that the river discharges 36,000 kg/day of COD compared to an estimated 6000 kg/day of COD discharged from the Mutwal outfall some 1500m from the shore. In addition, the concentration of total and faecal coliforms at the mouth of the Kelani is greater than in the seawater above the Mutwal outfall (http://www.rrcap.unep.org/pub/soe/srilanka_water.pdf).

According to a research done on the BOD load in San Sebastian canal the total load of BOD is 1800 kg/day with industry accounting for only 10% (De Cosse et al, 1997). Thus pollution of the canal is mostly caused by non point sources and by the household sector.

Many stagnant water bodies such as the Beira Lake, Kandy Lake, Lake Gregory and the Kotmale reservoir have undergone eutrophication and blooming due to nutrient pollution. Eutrophication deteriorates the stagnant waters and toxic substances resulting from degradation of toxic strains of *Microcystis* that can be added to the water, and such toxins affect human and animal health and can cause massive fish kills as in the Beira Lake, Kandy Lake and Kotmale reservoir. Treatment and restoration projects of polluted waters are exorbitant.

Eutrophication, or the process of nutrient enrichment of stagnant waters due to excessive use of fertilizer, is becoming a critical issue. Eutrophication and blooming in the recently constructed Kotmale reservoir due to excessive use of fertilizer in its upper Kotmale catchment has been identified.

The consequent risk of high phosphate levels in Nuwara Wewa and to a lesser extent in Tissa Wewa (both in Anuradhapura District) is severe (CEA 1994).

Leaching of agrochemicals from intensively cultivated soil is responsible for elevated concentrations of chloride, nitrate and potassium observed in many irrigation wells in the Kalpitiya peninsula, with nitrate concentrations of up to 40 mg/l.

Water is a human right

“Access to safe water is a fundamental human need and therefore a basic human right.” (Kofi Annan, United Nations Secretary General) Many civil society organizations argued that water should be treated as a human right. After many years of struggle water and sanitation has been accepted as a fundamental human right by the UN General Assembly on July 28,

Chapter II

Water quality and heavy metals

Scope of the study

Sri Lanka needs a comprehensive study on water pollution throughout the country. There is no such research data available in any institute. However, there are some research data available with some university professionals on certain locations depending on their capacities. These data are hardly available for the public use.

Our intension was to do the sampling in some hot-spots and provide a broader picture of the pollution in order to mobilize general public and policy makers to think the need of a better policies and strict enforcement of the existing regulations. Therefore, the scope was limited to the some major and critical water bodies which we decided adequate to bring such a message according to our capacity as a public interest environmental organization.

Sampling and methods of testing

Samples were collected in ad-hoc basis to obtain only heavy metal data as this is not an academic research. To detect the water quality of inland water bodies, CEJ tested water samples in several places such as canals, streams, stagnant water bodies, effluents discharged from factories etc.

Lead, Cadmium, Mercury, BOD and Coliform were analyzed at SGS Lanka Pvt Ltd.

The findings were compared with the general standards for discharge of effluents into inland surface waters by National Environmental Act No. 47 of 1980.

Following water samples were mostly taken from textile effluents and those highlighted in red color show the values that exceed the permitted limit by NEA.

Test Results

In 2009, CEJ analyzed for Ammonical Nitrogen, Sulphide, Chemical Oxygen Demand, Total Chromium, Copper Zinc, Mercury, Cadmium and Lead at National Building Research Organization in 2009 which is in An-



Sample set I

Five effluent water samples were checked for heavy metals around Colombo MC Area. The findings are as follows:

Parameter	Protocol	Permitted Limit by NEA*	S 6	S 7	S 8	S 9	S 10
Cadmium (as Cd) mg/l, max	APHA 21 st ED:2005	0.1	ND	ND	ND	ND	ND
Lead (as Pb) mg/l, max	APHA 21 st ED:2005	0.1	ND	0.68	ND	ND	ND
Mercury (as Hg) mg/l, max	APHA 21 st ED:2005	0.0005	ND	ND	ND	ND	ND
Nickel (as Ni) mg/l, max	APHA 21 st ED:2005	3.0	ND	ND	ND	ND	ND

ND – Not Detected

* - General standards for discharge of effluents into inland surface water

References –

S 6 – Stream, Rattapitiya, surface water, under ambient temperature in a plastic bottle, 3 L

S 7 – Stream, Kolonnawa stream near the container yard, under ambient temperature in a plastic bottle, 3 L

S 8 – Kelani ganga, surface water, Peliyagoda, under ambient temperature in a plastic bottle, 3 L

S 9 – Stagnant water, Bloemandhal dump, Madampitiya, under ambient temperature in a plastic bottle, 3 L

S 10 – Stream, surface water, Bloemandhal Beramulla Junction, under ambient temperature in a plastic bottle, 3 L

The samples were collected around major garbage dumps and water canals in Colombo. Only one sample exceeded the permitted level, which is Lead.

Note: The reason for the very low levels of heavy metals may be due to the monsoonal activity.

Sample set II

To detect the BOD and Coli form levels of the inland water bodies, six water samples were analyzed.

Parameter	Protocol	Permitted Limits	S 11	S12	S 13	S 14	S 15	S 16
BOD mg/l	APHA 21 st ED:2005	According to the permitted Limit by NEA* 30	31	35	36	217	50	67
Total Coliform (MPN method in LT broth at 37C ⁰ for 48h, then in BGB broth 37C ⁰ within 48 h)	ISO 9308-2:1990	**	5.4*10 ⁴	3.5*10 ³	79	1.6*10 ³	1.6*10 ³	1.6*10 ³

* - General standards for discharge of effluents into inland surface water

** - For total Coliform, permitted level is not declared in NEA

References-

S 11 – Norris Canal, surface water, 9.55 am, 13.08.2010, under chilled condition in sterilized glass bottles

S 12 – Heen ela, surface water, 10.10 am, 13.08.2010, under chilled condition in sterilized glass bottles

S 13 – Beira Lake, surface water, 10.25 am, 13.08.2010, under chilled condition in sterilized glass bottles

S 14 – Drain in front of Arpico, Navinna, surface water, under chilled condition in sterilized glass bottle and plastic bottle

S 15 – Katu ela, Delkanda, under chilled condition in sterilized glass bottle and plastic bottle

S 16 – Rajagiriya ela, surface water, under chilled condition in sterilized glass bottle and plastic bottle

All BOD samples exceeded the permitted level.

Sample set III

Another high Lead level detected location was found at an industrialized area, where a leading battery factory is in vicinity.

Parameter	Protocol	Permitted Limit by NEA*	S 17
Cadmium (as Cd) mg/l, max	APHA 21 st ED:2005	0.1	Not Detected (LOD-0.01 mg/l)
Lead (as Pb) mg/l, max	APHA 21 st ED:2005	0.1	56
Mercury (as Hg) mg/l, max	APHA 21 st ED:2005	0.0005	Not Detected (LOD-10µg/l)
Nickel (as Ni) mg/l,max	APHA 21 st ED:2005	3.0	1.3

* - General standards for discharge of effluents into inland surface water

References –

S 17 – Effluent water from drain in Katukurunduwatta Road, Ratmalana in vicinity of Associated Battery Manufacturers Ltd, under ambient temperature in a plastic bottle

Sample set IV

Parameter	Protocol	Permitted Limit by NEA*	S 18	S 19	S 20	S 21	S 22	S 23	S 24	S 25	S 26	S 27	S 28	S 29	S 30
Cadmium (as Cd) mg/l, max	APHA 21 st ED:2005	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead (as Pb) mg/l, max	APHA 21 st ED:2005	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND
Mercury (as Hg) mg/l, max	APHA 21 st ED:2005	0.0005	-	-	-	-	ND	ND	ND	-	-	-	-	ND	ND

References –

S 18 - Kandy Lake - 1ST DEPTH, 02.11.2010, 3.31 PM

S 19 - Kandy Lake - 1FT DEPTH, 02.11.2010, 3.44 PM

S 20 - Meda Ela, Kandy – Surface water, 02.11.2010, 4.01 PM

S 21 - Meda Ela, Kandy – Surface water, 02.11.2010, 4.14 PM

S 22 – Gregory Lake – Nuwara Eliya 10.17 A.M., 1ft Depth, 03.11.2010

S 23 - Gregory Lake - Nuwara Eliya 10.45 A.M., 1ft Depth, 03.11.2010

S 24 – Sandatenna Land Fill- Nuwara Eliya - Outlet from Sandatenna Leachate Treatment, 03.11.2010, 12.49 PM

S 25 - Sandatenna Land Fill- Nuwara Eliya - Wetland 1.07 PM

S 26 - Canal at Hawaeliya Wajira Mawatha, 03.11.2010, 4.21 PM

S 27 - Lindula Ela, Diagama, 11.59 AM, Nuwara Eliya, 04.11.2010

S 28 - Lindula Nuwara Eliya – Surface water, Canal, 04.11.2010, 1.51

S 29 – Nuwara Eliya - Lover’s Leap Canal before Hospital, 04.11.2010, 3.26 PM

S 30 – Nuwara Eliya - Lover’s Leap Canal after Hospital

Sample set V

Parameter	Protocol	Permitted Limit by NEA*	S 31
Lead (as Pb) mg/l, max	APHA 21 st ED:2005	0.1	ND

* - General standards for discharge of effluents into inland surface water

References –

S 31 - Water flowing from Kolonnawa oil tank side to Kelani River at Orugodawatta, 8.00AM, 22.11.2010

Some photographs of sampling locations are in Annex II



Chapter III

Laws and Institutions on Water in Sri Lanka

Water is sacred to most indigenous communities and traditional farmer communities. Water is, and has been treated as sacred in all religions. Unfortunately most people do not protect or conserve water, watersheds, and stream reservations as their responsibility. All sectors i.e Industrial, Commercial and domestic have the same habit of dumping all waste either liquid or solid to water bodies.

This has led to the develop much of rules and regulations to protect water. Many laws have been enacted over the years relating to water issues. Following are the laws and statutory bodies which involve in water resource and water quality management:

- The National Environmental Act No.47 of 1980 with Amendment Act No.56 of 1988, which lays down that “no person shall pollute any inland waters of Sri Lanka or cause or permit to cause pollution in the inland waters of Sri Lanka”.
- The State Lands Ordinance (No.8 of 1947, Part IX) which provides for the regulation and control of public waters and streams through a system of permits,
- The Irrigation Ordinance (No.32 of 1946 with amendments) which consolidates laws relating to irrigation,
- The Mahaweli Authority of Sri Lanka Act (No.23 of 1979) which empowers MASL to use and develop the water resources of the Mahaweli River,
- The National Water Supply and Drainage Board Act (No.2 of 1974, as amended) which describes the statutory duties of the NWSDB to provide water for public, domestic and industrial purposes,
- The Electricity Act (No.19 of 1950, as amended) provides licensing of installations for the generation of electricity. These licenses confer all rights necessary for the purpose of electricity generation including the right to use water,
- The Ceylon Electricity Board Act (No.17 of 1969, as

amended) describes the duty of the CEB to develop and operate systems for the supply of electricity including the right to use water for hydropower,

- The Fisheries and Aquatic Resources Act (No.2 of 1996) provides for the licensing of fisheries and aquacultural operations which require an allocation of water to carry out approved activities.
- Municipal Council Ordinance No. 16 of 1947
- Urban Development Authority Law No. 14 of 1978
- Sri Lanka Ports Authority Act No. 51 of 1979
- The Provincial Councils Act No. 42 of 1987

Statutory bodies:

- Central Environmental Authority
- Department of Irrigation
- Sri Lanka Ports Authority
- Sri Lanka Land Reclamation and Development Corporation

Natural Water Resources Policy

Sri Lanka has a recent history of producing water policies under the Asian Development Bank, and World Bank funded projects. There was much debate on the suitability of such a policy and the hidden objectives of the same. These policies were criticized by the civil society for trying to commodity water and water sources, introducing a water tax. The policy was then abandoned. However, the draft policies had number of good proposals including managing water sheds and regulating pollution.

- National Water Supply and Drainage Board
- Urban Development Authority
- Colombo Municipal Council
- Western Provincial Council

Followings are some of the main areas and sections under different acts that describe the legal base of water.

National Environmental Act NO. 47 of 1980

Section 18

The Authority in consultation with the Council shall, with the assistance of the Ministry of the Minister in charge of the subject of Fisheries, recommend to the Minister a system Of rational exploitation of fisheries and aquatic resources within the territorial waters of Sri Lanka, or within its exclusive economic zone, or within its inland waters and shall encourage citizen participation therein to maintain and enhance the optimum and continuous productivity of such waters.

Section 22

The Authority in consultation with the Council shall, with the assistance of the Ministry of the Minister in charge of the subject of Soil Conservation, recommend soil conservation programmes including therein the identification and protection of critical watershed areas, encouragement of scientific farming technique, physical and biological means of soil conservation, and short term, and long term research and technology for effective soil conservation.

23G. Subject to section 23A of this Act with effect from the relevant date, no person shall deposit or emit waste into the inland waters of Sri Lanka, except in accordance with such standards or criteria as may be prescribed under this Act.

23H. (1) No person shall pollute any inland waters of Sri Lanka or cause or permit to cause pollution in the inland waters of Sri Lanka so that the physical, chemical or biological condition of the waters is so changed as to make or reasonably expected to make those waters or

any part of those waters unclean, noxious, poisonous, impure, detrimental to health, welfare, safety or harmful to animals, birds, wildlife, fish, plants or other forms of life or detrimental to any beneficial use made of those waters.

(2) Without limitation to the generality of subsection (1) a person shall be deemed to contravene the provisions of that subsection, if—

(a) he places in or any waters or in a place where it may gain access to any waters any matter, whether solid, liquid, gaseous, that is prohibited by or under this Act or by any regulations made thereunder;

(b) he places any waste, whether solid, liquid, or gaseous, in a position where it falls, descends, drains, evaporates, is washed, is blown or percolates, is likely to fall, descend, drain evaporate, be washed, be blown, percolate into any waters or on the bed of any river, stream or other waterway when dry, or knowingly or through his negligence, whether directly or indirectly, causes or permits on such matter to place in such a position;

(c) he places waste on the bed, when dry, of any river, stream or other waterway or knowingly or through his negligence causes or permits any wastes to be placed on such a bed; or

(d) He causes the temperature or inland, coastal or off-shore waters of Sri Lanka to be raised or lowered by more than the prescribed limits.

(3) Every person who contravenes the provisions of subsection (1) shall be guilty of an offence, and on conviction shall be—

(a) liable to a fine not less than rupees ten thousand and not exceeding rupees one hundred thousand, and thereafter in the event of the offence being continued to be committed, to a fine of rupees five hundred for each day on which the offence is so continued to be committed; and

(b) Required to take within such period as may be determined by court, such corrective measures as may be deemed necessary to prevent further damage being caused to the inland, coastal and offshore waters of Sri

Lanka and furnish at the end of such period sufficient and acceptable proof of the incorporation of such corrective measures. The court shall also order such person convicted, to bear the expenses that may have been incurred by the authority in the correction of damage already caused as a consequence of the commission of such offence, and where such person fails to bear the expenses so incurred be recovered in like manner as a fine imposed by the court.

(4) Where any person convicted of an offence under subsection (3) continues to commit such offence after a period of six weeks from the date of his conviction, the court may upon an application for closure being made by the Director-General or any officer authorized in that behalf by the Director-General order the closure of such factory or trade, or business being carried at such premises, which caused the pollution of inland, coastal or offshore waters of Sri Lanka, until such time such person takes adequate corrective measures to prevent further damage being caused.

(5) In any case where such person fails to comply with the closure order issued under subsection (4), the Magistrate shall forthwith order the fiscal of the court requiring and authorizing such fiscal before a date specified in such order not being a date earlier than three or later than seven clear days from the date of issue of such order to close such factory or trade or business being carried at such premises. Such order shall be sufficient authority for the said fiscal or any police officer authorized by him in that behalf to enter the premises with such assistants as the fiscal or such police officer shall deem necessary to close such factory or trade or business being carried at such premises.

Fisheries and Aquatic Resources Act (No. 2 of 1996) **- Sect 6**

(1) No person shall engage in, or cause any other person to engage in, any prescribed fishing operation in Sri Lanka Waters except under the authority, and otherwise than to accordance with the terms and conditions, of a licence issued by the Director.

(2) The Director may in writing delegate the power of issuing licences to a Licensing Officer appointed under this section and for this purpose there may be appointed one or more Licensing Officers for each Administra-

tive District.

(3) No officer below the rank of Fisheries Inspector shall be appointed to be a Licensing Officer.

Section 31

(1) The Minister May, by Order published Gazette –
(a) designate prescribed areas of Sri Lanka Waters or land adjacent thereto or both such waters and land as fisheries management areas for the purposes of this Act;

(b) Designate the fisheries committee established section 32. in respect of any fisheries management area as the fisheries management authority of that area; and

(c) Where two or more fisheries committees have been established in respect of any fisheries management area, establish, by Order published in the Gazette a fisheries management authority for that area consisting of not more than twelve members drawn equally from each of those committees

(2) A fisheries management authority designated or established by an Order made under subsection (1), may make recommendations to the Minister on-

(a) The conduct of fishing operations and the use of different types of fishing gear in that fisheries management area;

(b) The establishment of closed seasons for fishing or closed seasons for the taking of specified species of fish in that fisheries management area; and

(c) The times during which fish may be taken,

Section 38

Subject to the provisions of the Crown Lands Ordinance there shall be leased, such portions of, State land or the Sri Lanka Waters as the Minister may consider necessary in the interest of the national economy, for the purpose of aquaculture.

National Water Supply and Drainage Board Law (No. 2 of 1974) –

Section 16

(1) It shall be the duty of the Board in each area of its authority:

(a) to develop, provide, operate and control an efficient, coordinated water supply and to distribute water for public, domestic or industrial purposes;

(b) to establish, develop, operate and control an efficient, coordinated sewerage system;

(c) to take over and carry on any water supply or sewerage undertaking transferred to the Board under section 57;

(d) to take over and carry on any water supply or sewerage undertaking of any local authority transferred to the Board under section 64 by a voluntary transfer Order or a compulsory transfer Order;

e) to provide a supply of water and distribute it or sell water in bulk or otherwise, to any local authority, any Government department, any other institution or organization, or any individual; and

(f) to do all other acts and things as may be necessary for the aforesaid purposes

Section 17

The Board may exercise all or any of the following powers:-

(a) to purchase water in bulk;

(b) to carry out investigations and to collect and record data concerning the provision, development and maintenance of water supply and sewerage services

f) to conduct research into matters affecting the provision, development and maintenance of water supply and sewerage services;

j) to enter into joint schemes with any Government department or any body approved by the Minister, for the provision, development and maintenance of water supply and sewerage services;

Section 22

The Board may from time to time in any part of Sri Lanka construct intakes, filters, tanks, aqueducts or other works for bringing water to the area or areas of authority of the Board for the use of the inhabitants.

Section 24

(1) If any private street has been constructed to which one or more houses have access, the Board may lay, enlarge, or extend a water main along such private street of such dimensions as may be necessary, and may apportion the whole or part of the cost of laying, enlarging, or extending such main among the owners of the premises fronting upon, adjoining, abutting, or having access to, or deriving any degree of benefit from, such main according to the areas of the respective premises which may derive, or be so situated as to derive, any such benefit from the laying, enlarging, or extending of the said main.

Section 26

A supply of water for domestic purposes shall not include a supply of water for horses, or cattle or for washing vehicles where such horses, cattle or vehicles are kept for sale or hire, or a supply for any trade, manufacture, or business, or for fountains or swimming baths, or for any ornamental or mechanical purpose, or for purposes of irrigation.

Section 29

The General Manager of the Board may repair or renew or substitute any pipe, valve, cock, cistern, soil pan, water-closet, or other apparatus or receptacle in any premises so as to prevent any waste of water, and the expenses of such repair or renewal or substitution shall be defrayed by the owner or occupier of the premises, and the same may be recovered by the Board as if it were a water supply charge payable under this Law.

Section 33

Every person who wrongfully takes or uses any water from any reservoir, watercourse, conduit, or pipe belonging to the Board, or from any pipe leading to or from any such reservoir, watercourse, conduit, or pipe,

or from any cistern or other like place containing water belonging to or supplied from the Board, or for the use of any consumer of the water of the Board, other than such as may have been provided for the gratuitous use of the public, shall be guilty of an offence and liable on conviction after trial before a Magistrate to a fine not exceeding one hundred rupees.

Section 37

Every person who shall commit any of the offences next hereinafter enumerated shall on conviction after trial before a Magistrate for every such offence be punished with a fine not exceeding fifty rupees, that is to say: -

(a) Bathing in any stream, reservoir, aqueduct, or other waterworks belonging to the Board, or washing, throwing, or causing to enter therein any dog or other animal;

b) throwing any rubbish, dirt, filth, or other noisome thing into any such stream, reservoir, aqueduct, hydrant, surface-box, or other waterworks as aforesaid, or washing or cleansing therein any cloth, wool, leather, or skin of any animal, or any clothes or other thing

c) Trespassing upon land belonging to the waterworks or upon the buildings or premises connected with the water supply;

(d) unlawfully breaking, injuring, or in any other manner causing damage to any channel, tank, reservoir, cistern, well, fountain, stand-pipe or other work connected with the water supply;

(e) causing the water of any sink, sewer, or drain, steam engine, boiler, or other water belonging to him or under his control, to run or be brought into any stream, reservoir, aqueduct, or other waterworks belonging to the Board, or doing any other act whereby the water belonging to the waterworks shall be fouled;

and every such person shall be liable to a further fine of ten rupees for each day (if more than one) that such last-mentioned offence shall be continued.

Section 38

(1) Whoever, being the owner, superintendent, agent, manager, or occupier of any premises in which any

business is carried on does or causes to be done any act connected with such business by which the water in any stream, reservoir, cistern, aqueduct, or other work belonging to the Board is or is likely to be fouled, shall be guilty of an offence, and liable on conviction after trial before a Magistrate notwithstanding the provisions of section 87, to a fine not exceeding one thousand rupees, and a further fine not exceeding five hundred rupees for each day on which the offence is continued after the expiration of twenty-four hours after a notice signed by the General Manager of the Board is served on any such person.

(2) The General Manager of the Board or any person authorized by him in writing in that behalf may, with the permission of the Chairman of the Board, after the expiration of twenty-four hours after the notice signed by the General Manager of his intention so to do has been served on such owner, superintendent, agent, manager or occupier, lay open and examine any pipe or work directly or indirectly connected with such premises, and any stream, reservoir, cistern, aqueduct, or other work belonging to the Board.

State Lands Ordinance No 08 of 1947

Section 49

Subject as hereinafter provided, the Minister may, by Notification published in the Gazette, declare that any State land is constituted a State reservation for any one or more of the following public purposes:-

(1) The protection of the source, course or bed of any public stream,

(2) The protection of springs, tanks, reservoirs, lakes, ponds, lagoons, creeks, canals, aqueducts, and channels (whether natural or artificial) paddy fields and land suitable for paddy cultivation

(3) The protection of foreshore

(7) The preservation of water supplies

71. The Minister may, by Notification published in the Gazette, declare that any tank or reservoir described in that Notification shall be a lake for the purposes of this part notwithstanding that such tank or reservoir is an artificial

work, and upon the publication of any such Notification, any reference in this part to a lake shall be deemed to include a reference to the tank or reservoir described in that Notifications.

National Heritage Wilderness Areas Act, No. 3 of 1988
Section 4. (1)

No person shall in a National Heritage Wilderness Area
 (a) cut, mark, lop, girdle, saw, convert, collect or remove any plant, tree or any part thereof or any other forest produce

(b) wilfully strip off the bark or leaves from, or otherwise damage or interfere with, any tree ;

(c) cut grass or pasture cattle ;

(d) pollute water ;

(e) remove, uproot or destroy, or cause any damage or injury to, any plant ;

(f) sell, expose or offer for sale, any plant ;

Marine Pollutions Prevention Act no 59 of 1981

The Act (37 section) provides for the prevention, reduction and control of pollution in Sri Lanka waters and gives effect to international conventions for the prevention of pollution of the sea .

Colombo Municipal Council Water Works Ordinance

Section 07.

The Council Shall Provide a supply of drinking water within the Municipality of Colombo, and shall for that purpose cause such pipes to be laid, and such tanks, reservoirs, or other works to be made, as are necessary for the supply of wholesome water in the public streets of the Colombo Municipality, and shall erect in such streets convenient stand-pipes, fountains, open reservoirs, or pumps for the Municipality for purposes. It shall be the duty of the Council, as far as possible, to make adequate provision that such apply of water shall be continuous throughout the year ,and that the water supplied shall be at all times fit for human consumption.

Section 08.

Subject to the provisions of Section 20, the Council shall within the limits of the Municipality of Colombo provide a supply of water for the use of the Government and of the armed forces, which for domestic purposes shall be supplied free of charge, but for other than public purpose shall be supplied in accordance with the provisions of this ordinance and of any regulations made there under relating to the supply of water for other than domestic purposes.



Chapter IV

Conclusion and Recommendations

This study specifically focuses on the water quality of Colombo metropolitan area. Most of the Colombo waterways had been dirty and severely contaminated but at present the situation is somewhat better.

These canal banks were so ugly and there were many waste water outlets from household and industries were visible about in the 90s. However, there were some projects to rehabilitate the canals and resettle people who lived along the canal banks in the past 2 decades. Continuous cleaning programmes operated in the entire country due to the dengue eradication programme may be another reason to have cleaner canal system.

However, at tested locations, BOD levels were higher and the total Coliform levels also were in high values. However it should be noted that the permitted level of total Coli form for inland waters has not been specified yet.

During our water sample analysis, neither Mercury nor Cadmium was found. However, few lead was detected in few samples. Comparatively a high Lead content was found in the vicinity of a battery factory at Rathmalana and the Kolonnawa canal which brings dirty water from the oil storage facility belongs to the Ceylon Petroleum Corporation.

Justice for waters

Though there are multiple laws on water to protect and conserve the water resources of the country, sufficient protection to water has not been received yet. There are multiple reasons for such a situation.

More importantly there should be a greater attitudinal change towards water as a part of the life line and that nothing on earth can survive without water. As humans are the only species which destroy water, they only can reverse the situation. This can be only done through better education and awareness at all levels.

There are number of agencies which involve in managing water. Irrigation Department, Mahaweli Authority, Low land Reclamation Authority, Central Environmental Authority, Coast Conservation Department, Forest Department, Wild life Department, and number of

other provincial and local authorities can be lined up. However, lack of co-ordination between governmental organizations responsible is a key problem for the quality and quantity of water.

Weak monitoring of illegal discharge of industrial effluents into waterways is another main problem. According to the CEA, more than six thousand factories are operating in the Western Province without obtaining EPLs. Discharge of effluents, especially domestic waste, to the waterways has become frequent. Although there are treatment facilities, some factories release the effluents to water ways. Out of 77,000 industries, only 17,000 have obtaining the license according to the CEA figures.

Lack of a comprehensive central data base for water quality and industrial activities is a major gap in legal enforcement. Periodic analysis of water quality has been done in selected waterways but the parameters are not sufficient.

Political influence is a major problem in protecting water bodies from pollution, mining and encroachments. This political influence in the Courts system must be eradicated and Courts must be more concerned on the national issues like Environmental pollution.

Some prevailing laws are outdated and there are several loopholes through which offenders escape and innocent parties face the injustices. The set fines are very low in the current context. Then trustworthiness of the courts collapses and thus prevents the people to come before the Courts.

Delay of the pollution related court cases is a major issue for environmental law enforcement. When legal issues come to the Courts, they take much time and involve considerable amount of money to finalize the case and thereby discourages people to seek justice through Courts.

Among other approaches such as environmental awareness, better coordination among the agencies involve, following areas have to be addressed more effectively to improve the legal protection to water.

- Existing laws on water must be implemented properly and not be allowed to be dead laws.
- The loopholes in statutes regarding laws on water must be amended and must be made binding laws.
- Also the 'Polluter Pay Concept' must be enforced thoroughly to protect public waterways.
- Organizations which are working for the protection of water must be motivated to take steps to protect water laws and strong actions including police actions to the parties who violate the water laws.
- Lack of solid and liquid waste management is a major reason for water pollution. In the meantime, long term waste management practices have to be established to prevent haphazard dumping of garbage.
- Fresh laws must be enacted empowering authorities to protect water bodies by implementing them.
- Public Interest litigations must be promoted in the courts system to create experiences as a sensitive approach towards public issues and to increase access of public to lawsuits on national issues.
- Establishment of a permanent green water tribunal is a need of the day. We encourage the relevant authorities to establish such a tribunal within the court system.
- The public should be made aware of the legal framework relevant to protection of water and encouraged to fight against water pollution and other environmental issues.
- International Conventions regarding protection of water must be signed and ratified to grab the good examples and relevant averments of them for inland issues.
- Several agencies have legal responsibility in monitoring including the Mahaweli Authority and the Coast Conservation Department. The National Aquatic Resources, Research and Development Agency (NARA) are responsible for scientific research in this field. The quality of drinking water supplied by NWSDB is monitored in their central and regional laboratories.
- Protecting water bodies from encroachment is an integral part of these laws. There are adequate laws available to stop construction in the reservation and in the near catchments. However, lack of implementation is a key problem.
- An appropriate, continuous water quality monitoring programme for industrial discharges and for agriculture discharge is essential in collaboration with responsible authorities. Government agencies should cooperate with universities and research institutes to conduct water analysis.
- Furthermore, awareness programmes should be conducted for the community on the hazards of water pollution and the required mitigatory measures.
- In order to minimize industrial pollution, central waste water treatment plants have to be established in industrial parks.
- Appropriate solid waste and waste water disposal techniques should be implemented.
- The adoption of cleaner production techniques should be encouraged.

Water is undoubtedly a basic need for every living being. It is an integral part of all the systems including human body. Now water has been declared as a fundamental human right. This cannot be achieved without stopping water pollution, unless we protect the water bodies and the function of all wetlands, river catchments and all parts of the water cycle. This cannot be done by just regulators, unless all take part in that effort.

All humans have to ensure justice to waters to ensure right to water. Justice for waters is a justice for all.

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Annex I

Five effluent water samples were checked from Ratmalana, an industrialized area. Followings are the results:

Parameter (mg/l)	Protocol	Permitted Limit by NEA*	S 1	S 2	S 3	S 4	S 5
Ammoniacal nitrogen (as N) mg/l	APHA-4500-NH ₃ -C (distillation)	50.0	7	27	31	16	16
Sulphide (as S) mg/l	APHA-4500-S ²⁻ -F	2.0	5.8	4	<2	<2	5.7
COD mg/l	APHA-5220-B	250	324	158	69	584	824
Total Chromium (as Cr) mg/l	AAS	0.1	0.6	0.01	<0.01	<0.01	<0.01
Copper (as CuO mg/l)	AAS	3.0	0.98	0.52	0.51	0.06	0.08
Zinc (as Zn) mg/l	AAS	5.0	0.13	0.07	0.19	0.08	0.09
Mercury (as Hg) mg/l	AAS-MVT	0.0005	NT	NT	NT	NT	<0.0004
Cadmium (as Cd) mg/l	AAS	0.1	0.02	0.01	NT	NT	<0.01
Lead (as Pb) mg/l	AAS	0.1	8.7	7.8	NT	NT	0.5

* - General standards for discharge of effluents into inland surface water

APHA – Standard Methods for the Examination of Water and Wastewater, APHA AWWA WEF, 20th Ed

AAS – Atomic Absorption Spectrophotometer

MVU – Mercury Vapor Unit

NT – Not Tested

References –

S 1 – Sample from industrial area at Ratmalana, turbid effluent, 4 L

S 2 – Sample from Little Dinmand at Ratmalana, turbid effluent, 4 L

S 3 – Sample from Brandix at Ratmalana, turbid coloured effluent, 4 L

S 4 – Sample from chemical industry at Ratmalana, turbid effluent, 4 L

S 5 – Sample from Backsons Textile at Ratmalana, turbid coloured effluent, 4 L

Annex II

The new map developed by WRI listed the Dutch Canal of Sri Lanka as eutrophic area.

<http://www.wri.org/project/eutrophication/map>

Schedule I

General Standards for Discharge of
Effluents into Inland Surface Waters

<i>No</i>	<i>Determinant</i>	<i>Tolerance Limit</i>
1	Total Suspended Solids, mg/l, max	50
2	Particle size of total suspended solids	Shall pass sieve of aperture size 850 micro m.
3	pH value at ambient temperature	6.0 to 8.5
4	Biochemical Oxygen Demand – BOD ₅ in 5 days at 20 ^o C, mg/l, max	30
5	Temperature of discharge	shall no exceed 40 ^o C in any section of the stream within 15 m down stream from the effluent outlet
6	Oils and greases, mg/l, max	10.0
7	Phenolic compounds (as phenolic OH) mg/l, max	1.0
8	Cyandes as (CN) mg/l, max	0.2
9	Sulfides, mg/l, max	2.0
10	Flourides, mg/l, max	2.0
11	Total residual chlorine mg/l, max	1.0
12	Arsenic, mg/l, max	0.2
13	Cadmium total, mg/l, max	0.1
14	Chromium total, mg/l, max	0.1
15	Copper total, mg/l, max	3.0
16	Lead total, mg/l, max	0.1
17	Mercury, mg/l, max	0.0005
18	Nickel total, mg/l, max	3.0
19	Selenium total, mg/l, mg	0.05
20	Zinc total, mg/l, max	5.0
21	Ammonical nitrogen, mg/l, max	50.0
22	Pesticides	undetectable
23	Radio active material	
	(a). Alpha emitters micro curie/ml	10 ⁻⁷
	(b). Beta emitters micro curie/ml	10 ⁻⁸
24	Chemical Oxygen Demand (COD), mg/l, max	250

Annex IV

**General Standards for Industrial Waste Water (Effluents) Discharged into
Inland Surface Waters (After Treatment)**

<i>Parameters</i>	<i>Maximum Tolerance Limit</i>
Ph	6.0 – 8.5
Suspended Solids (mg/l)	50
Temperature (°C)	40
BOD (5 days AT 20°C) (mg/l)	30
COD (mg/l)	250
Phenolic compounds (as C ₆ H ₅ OH) (mg/l)	1.0
Cyanides (mg/l)	0.2
Sulphides (mg/l)	2.0
Fluorides (mg/l)	2.0
Total residuals Chlorine (mg/l)	1.0
Ammonical Nitrogen (as N) (mg/l)	50
Arsenic (as As) (mg/l)	0.2
Cadmium (as Cd) (mg/l)	0.1
Chromium (as Cr) (mg/l)	0.1
Copper (as Cu) (mg/l)	3.0
Lead (as Pb) (mg/l)	0.1
Mercury (as Hg) (mg/l)	0.0005
Nickel (as Ni) (mg/l)	3.0
Selenium (as Se) (mg/l)	0.05
Zinc (as Zn) (mg/l)	5.0
Pesticides	Nil
Oil and grease (mg/l)	10.0
Radio active materials	
Alpha emitters (µc/ml)	10 ⁻⁷
Beta emitters (µc/ml)	10 ⁻⁸

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