

## Notes:

### Capacity Building and Mainstreaming of Sustainable Land Management.

The Government of Saint Lucia through the Ministry of Physical Development and Environment is executing the Capacity Building and Mainstreaming of Sustainable Land Management Project in collaboration with the United Nations Development Programme (UNDP)/ Global Environment Fund (GEF).

The objective of the project is to strengthen capacity for sustainable land management at the individual and institutional level and to mainstream Sustainable Land Management (SLM) concepts into national development strategies and policies. Sustainable land management as defined by the UN Earth Summit in 1992 is "the use of land resources, including soils, water, animals and plants for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions"

The Ministry is presently conducting training programmes geared at providing guidance in sustainable land management principles and practices. The training programmes are being directed at technical staff from the Government Organizations, Farmer Organisations, and Water Catchment Groups who are trained and actively engaged in providing technical support and policy guidance on SLM to stakeholders. The training is also being provided to other natural resource users such as the construction, commercial, and tourism sectors, to empower them and facilitate the provision of support and guidance previously mentioned.

This training should ensure that sustainable land management practices are adhered to on a day to day basis in the stakeholders' professional activities.



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## APESSL Outlook - A Special Issue for World Water Day 2012

World Water Day observed on March 22<sup>nd</sup> each year recognizes the world's most precious natural resource. Whilst we in St. Lucia often take water for granted, many millions worldwide cannot afford that luxury. Water plays a part in almost all we do. In fact, without it life as we know it would simply not exist. Water has the power to sustain life or, as we have seen not too long ago, ravage it and bring a country to its knees. In all cases water deserves our respect.

**As engineers, we can mitigate the potential destructive force of water through our designs. We also have to preserve and protect water resources. We have the capabilities to design for sustainability and thus accomplish both.**

## Association News

**Honourable Minister of Infrastructure challenges the Association of Professional Engineers (APESSL) to utilise modern technological advances to permanently improve the lives of St. Lucians.**

At a gathering held on Thursday 22<sup>nd</sup> March under the theme of the APESSL's Lecture Series, Minister Philip J Pierre met with the members of the Association to address the renewed role of the engineering profession in national development. The Government will collaborate with the Engineering Society to review the role and functionality of the engineer within the process of national development. This collaboration is timely, given the challenges faced in restoring infrastructure damaged by Hurricane Tomas and developing an environment which embraces science and technology as a platform for environmentally sustainable development.

Minister Pierre informed that the Government will as far as practicable invite local engineers to tender on a competitive basis for major engineering consultancies and will facilitate a revision to the Engineers Act and implement amendments as necessary to keep the Act relevant and consistent with global trends. The Ministry of Education will issue a clear policy statement on the recognition and accreditation of any engineering programme. However, in the interim a list of recognised accreditation bodies will be established and the level of equivalences of accreditation bodies be maintained. Also, to assist in the development recently graduated engineers, the Ministry of Infrastructure will establish an apprenticeship programme system for these engineers to obtain experience.

The Minister stated that the Association must be the vanguard of ingenuity and creativity. Efforts should be made to embrace a value system which promotes a humanistic perspective to science and technology. The APESSL must also play a leading role in ensuring a sustainable future for the country and in light of that, future engineers must be increasingly inter-disciplinary in order to liaise with other disciplines seamlessly to consider and implement solutions.

# Environmental Focus - WATER WATER WATER!!!

(by Justin Roosevelt Sealy MAPESL)

World Water Day is celebrated on 22<sup>nd</sup> March which follows World Forest Day celebrated on 21<sup>st</sup> March; a coincidence?...I don't think so.

Water is circulated through a cycle called the hydrologic [water] cycle powered by the sun.



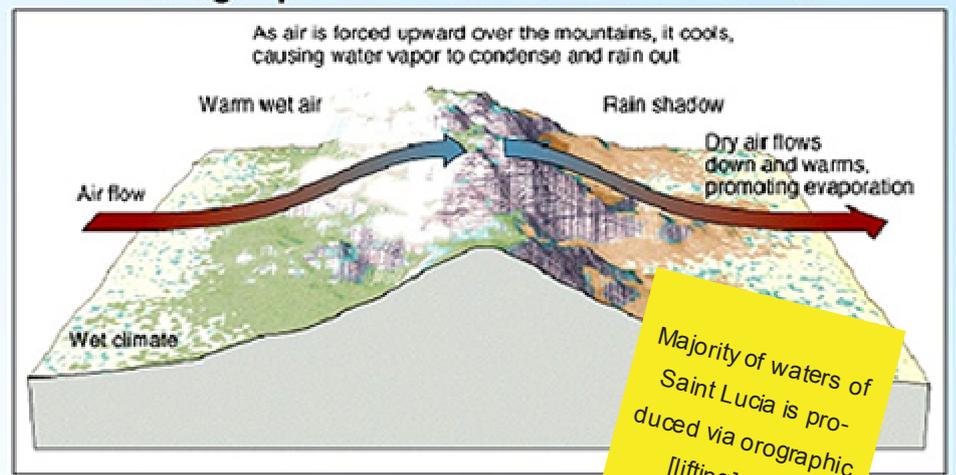
Precipitation in Saint Lucia is achieved predominantly through orographic lifting. Orographic lift occurs when an air mass is forced from a low elevation to a higher elevation as it moves over rising terrain.

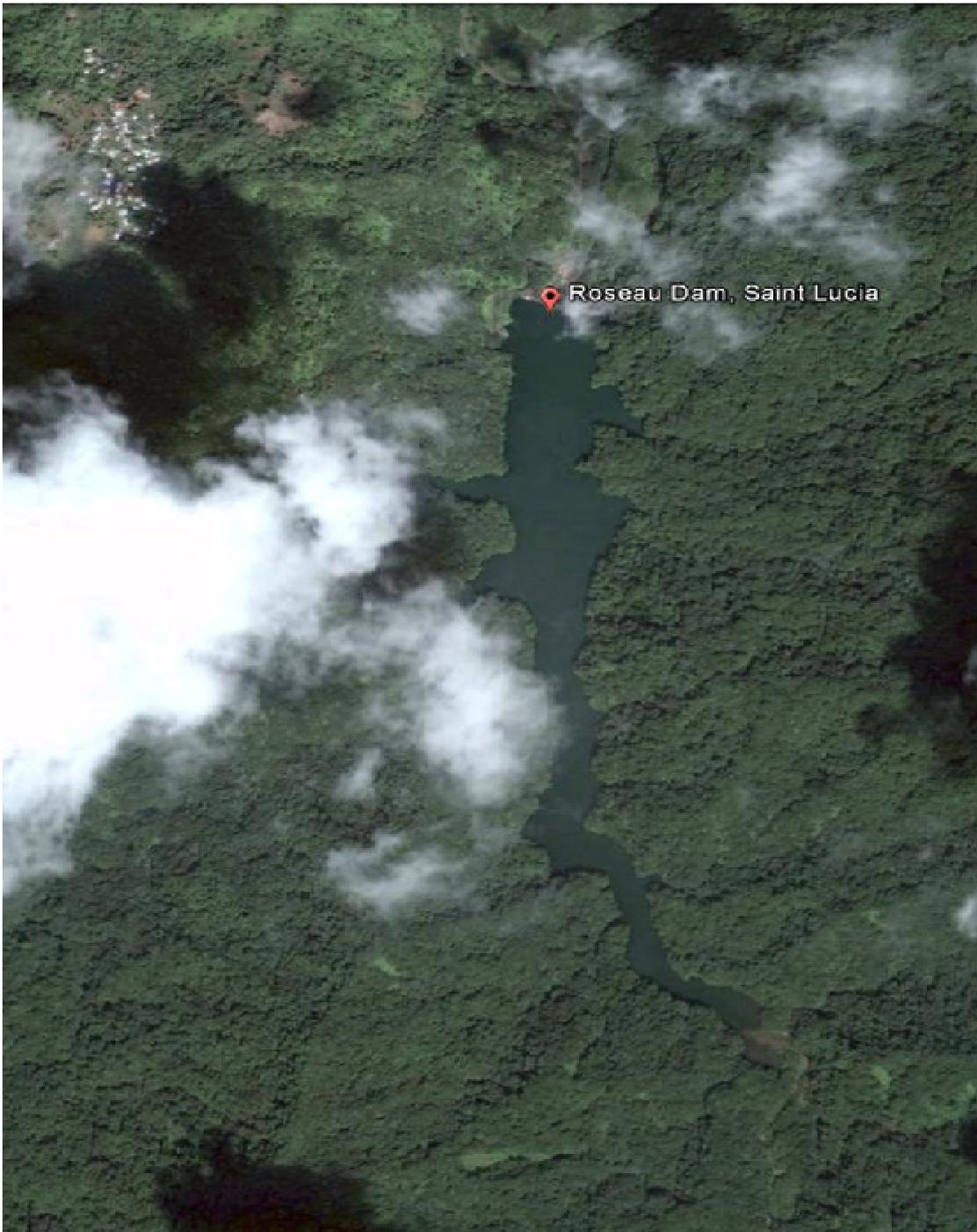
As the air mass gains altitude it quickly cools down adiabatically, which can raise the relative humidity to 100% and create clouds and, under the right conditions, precipitation.

## Hydrologic [water] cycle

The highest elevation in Saint Lucia is the Mount Gimie mountain range, 950m (3117ft), where the highest rainfall is measured; this is also where the John Compton Dam is located.

## Orographic effect - Rain Shadow





Aerial photo of the John Compton Dam, located in close proximity to Mount Gimie mountain range and within the watershed.

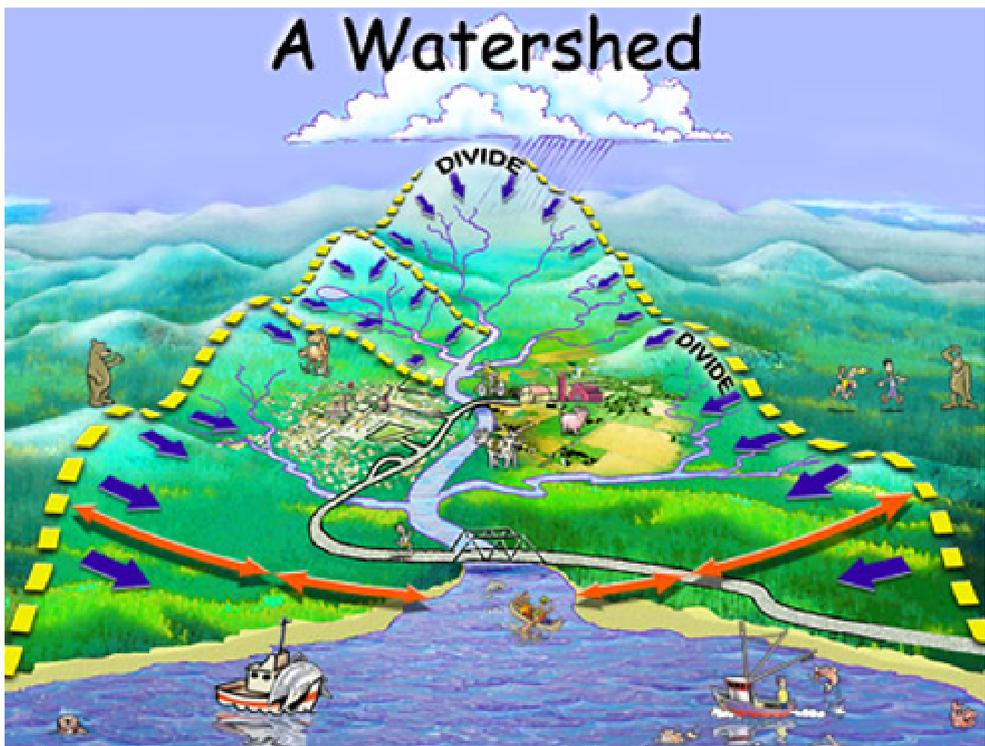
Waters include, but not limited to, head waters, raw waters, potable water, ground water, wastewater, storm waters and marine waters.

Raw water includes head waters and ground waters which are used to produce potable water. Head waters are also used for irrigation and satisfying riparian water rights.

Wastewater is potable water wasted from households and businesses and is divided into black and grey water.

Poor farming practises, uncontrolled development and other unsustainable practises within a watershed can jeopardise the quantity and quality of head waters, ground waters and marine waters.

Destruction of forested areas within a watershed reduces water gathering grounds. The area available for gathering grounds is proportional to the quantity of water available in rivers or streams. Deforestation also reduces ground water recharge areas which also provide base flow for rivers and streams making them perennial streams.



Baseflow (also called drought flow, groundwater recession flow, low flow, low-water flow, low-water discharge and sustained or fair-weather runoff) is the portion of streamflow that comes from "the sum of deep sub-surface flow and delayed shallow subsurface flow". It should not be confused with groundwater flow.

Poor practices and improper disposal of wastewater within the watershed can introduce pesticides and other contaminants into rivers and streams leading into marine waters and ground water supplies. Rivers and streams also carry stormwater to the ocean.

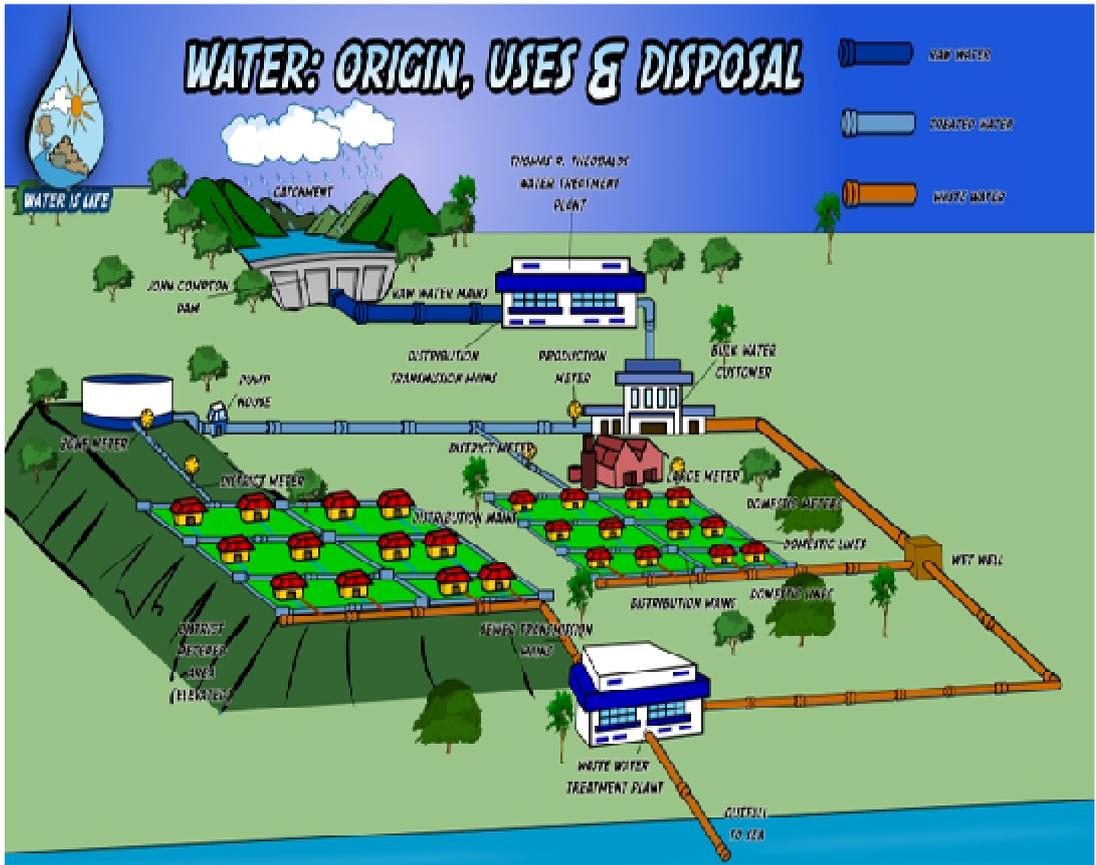
**Graphical depiction of a watershed**

Wastewater and stormwater can be nutrient rich and contaminated with Bacteria and viruses. The most notable nutrients are nitrates and phosphates, and the most notable bacteria is faecal coliforms. Stormwater will also carry improperly disposed solid waste through drains. Polluted marine waters negatively impact the health of humans who recreate within. Polluted marine waters will also destroy fish habitats and marine life, most notably corals which also provides a habitat for other marine life. The coral



Note the similarity with Graphical Depiction of Watershed above.

**Anse La Raye Village**

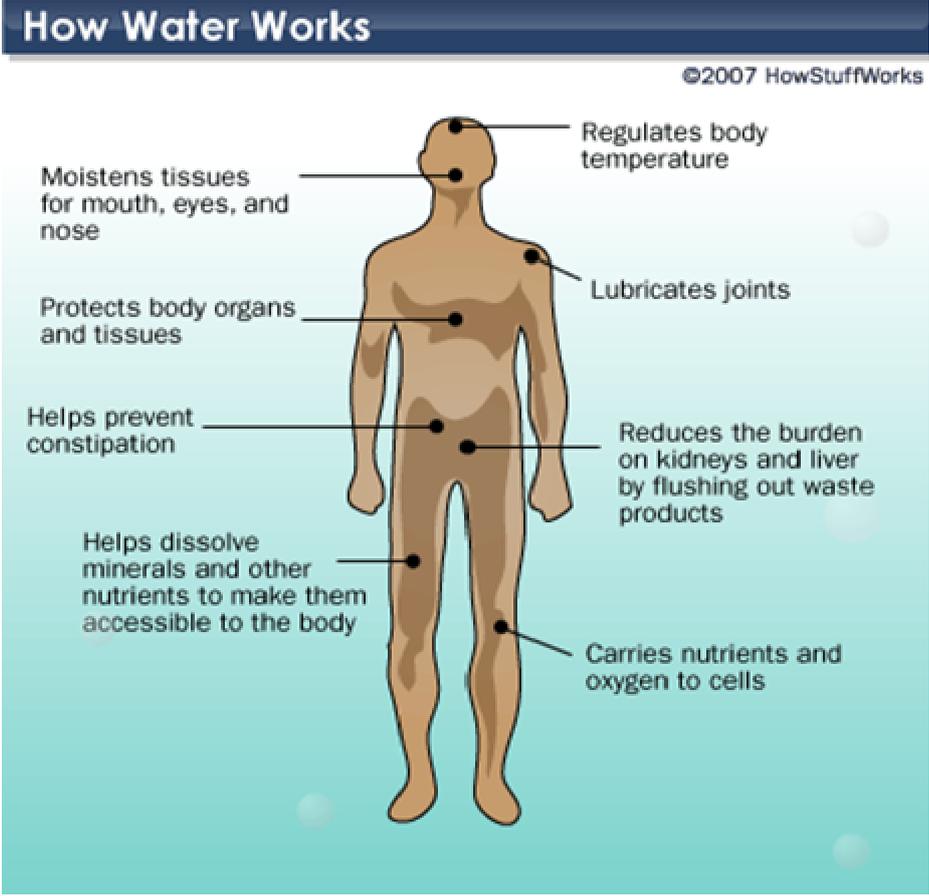


Forested areas provide the head water needed for WASCO to produce potable water, irrigation and satisfying riparian rights .

population has been severely reduced by polluted water entering the marine environment, the biggest pollutant being untreated sewage.

We are at the centre of the water cycle and we need to understand the intricacies of the environment and the impacts of our activities. Bad practices in the upper limits of a watershed will directly jeopardise our water supplies and health and that of our future generations. Poor treatment of wastewater and indiscriminate disposal of solid waste will directly affect the marine waters which we recreate within and also obtain [sea] food.

The body's need for potable water.



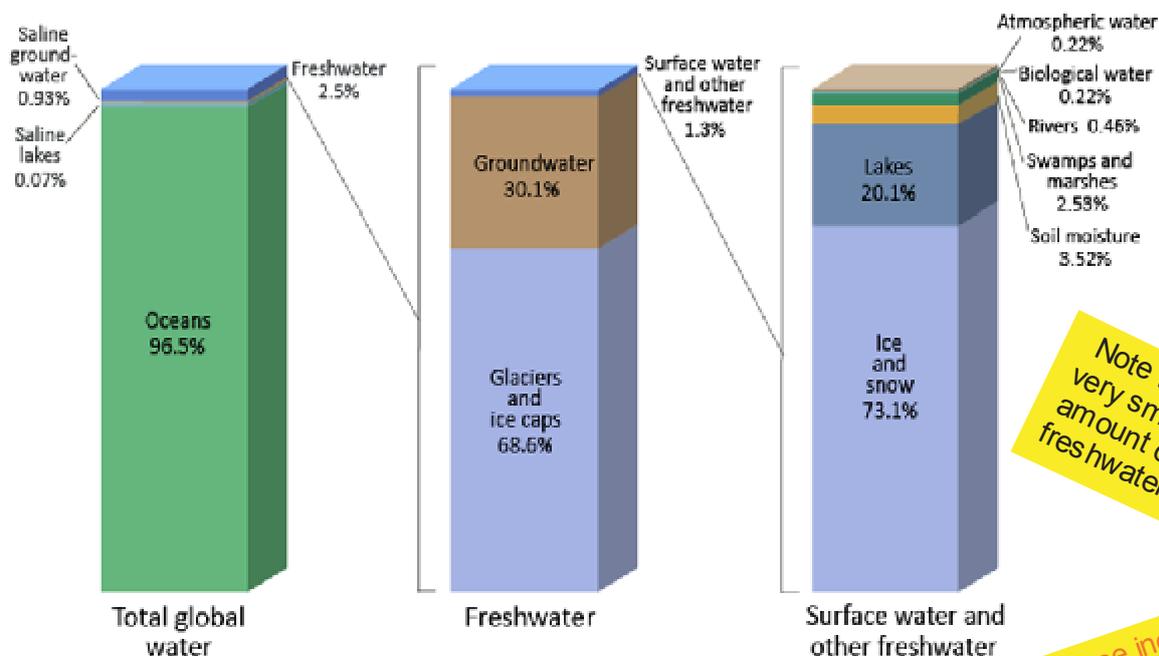


## Typical Household Water Use (Indoor)

After "Residential End Uses of Water," by permission.  
Copyright 1999, American Water Works Association and AWWA Research Foundation

### Household uses of water

## Distribution of Earth's Water



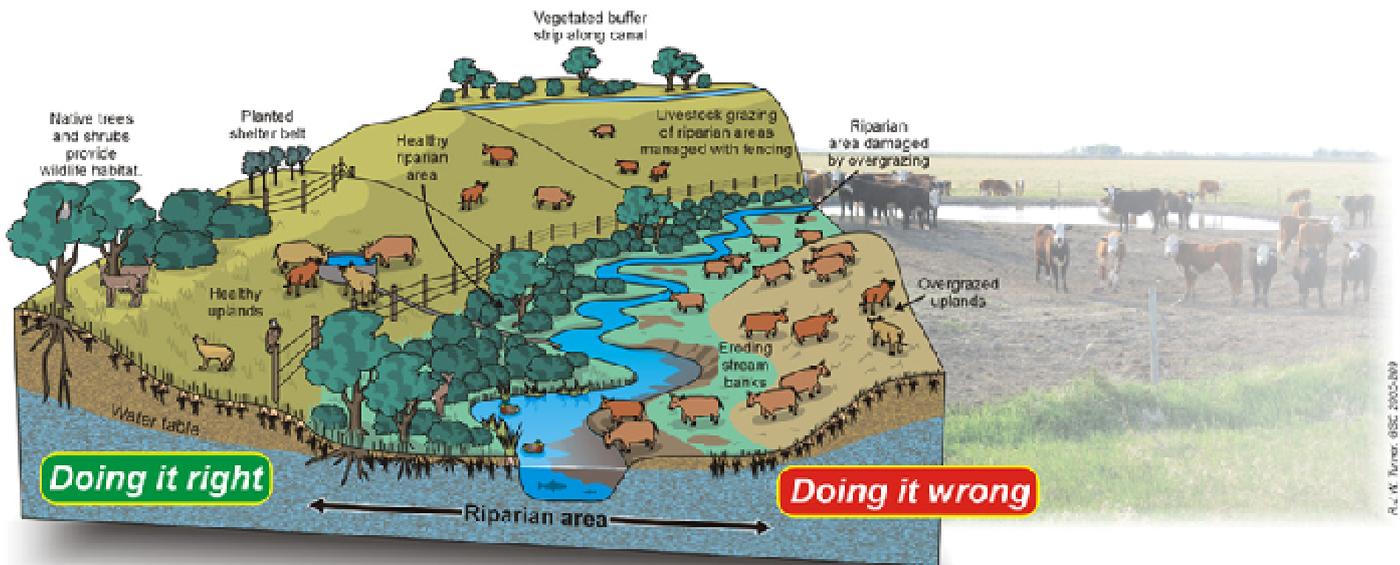
Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources.

Note the very small amount of freshwater

These indicate that there is very little freshwater available for human utilisation.

### Distribution of earth's water

## Out on the range



### Right versus poor farming practices



**Poor construction practices, stripping the land without measures to prevent soil erosion especially during rain events**



**Storm water contaminated with an oil based chemical**



**Silt laden water heading to the sea**



**Marine water laden with solid waste**



**Silted waters polluting marine waters**

The main pollutant of marine waters is untreated wastewater. The following statistics from the 2010 census indicates that only 6.6% of the population is connected to the sewer network and 62.8% of households have septic tanks. It is questionable if the septic tanks with soak-a-ways provide adequate treatment.

Type	1980	1991	2001	2010
percentage of households				
Septic Tank	11.5	30.0	47.2	62.8
Pit Latrine	51.4	49.1	35.3	23.1
Linked to Sewer	7.0	8.4	5.3	6.6
None	21.8	8.9	9.2	6.2
Other	4.0	3.7	1.0	1.3
Not stated	4.4	0.0	1.9	...
Total Households	24,810	33,079	41,481	58,920

**Distribution of Households by Toilet Facilities**  
**Source: Saint Lucia Population & Housing Census 2010**

By acceding to the LBS Protocol, Saint Lucia has committed to a 20-year timetable for providing sewage treatment. The LBS Protocol was adopted on October 6, 1999 by 16 contracting parties to the Cartagena Convention; therefore Saint Lucia has 7 years to comply.

Category	Effective Date of Obligation (in years after entry force)	Effluent Sources
1	0	All new domestic wastewater systems
2	10	Existing domestic wastewater systems other than community wastewater systems
3	10*	Community with 10,000 – 50,000 inhabitants
4	15	Community with more than 50,000 inhabitants already possessing wastewater collection systems
5	20	Communities with more than 50,000 inhabitants not possessing wastewater collection systems
6	20	All other communities except those relying exclusively on household systems

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## What's on your Mind?

This special issue of **Outlook** highlighting 'Water Week' had me thinking of water in general, its destructive power and why we don't seem to give it (water) the respect it deserves. As engineers we design to solve problems of infrastructure. In an effort to satisfy a client's requirements, we design solutions seemingly attempting to bend the will of nature.

It's our job, what we're paid to do. No problem there, but the holistic view however, as it regards building along rivers and in floodplains is that we sometimes promote what may be considered unwise practices.

What would be considered unwise practices? Well these may include those land use practices which destroy special qualities of the floodplains without genuine efforts to mitigate adverse impacts, hence posing severe threat or unnecessarily increasing the risk to human life, health, property, and leads to increases in flood losses.

Thus, an unwise action may be the construction of an earth retaining structure, road embankment, flood bund etc, without due consideration to how that structure would impact river hydrology.

We may quite selfishly and shortsightedly be solving one perceived problem whilst introducing other, possibly much more detrimental ones.

*Floodplains serve a very important purpose within river systems. They provide natural storage capacity.*

*With encroachment and filling, the loss of storage capacity translates into a more rapid movement and higher flood peaks downstream. Important decisions regarding use should not be made in a vacuum.*

I'm not suggesting a halt in developing within floodplains (floodplain urbanization as it's sometimes called) but the need for balancing the sociopolitical and economic pressures forcing decisions towards development with the critical need to mitigate adverse impact.

What I'm hinting at is more sustainable development management as regards floodplains; which can come about with better planning and control.

Christopher Wyatt MAPESL

## Notice from Saint Lucia Bureau of Standards

The British Standards Institute (BSI) has announced amendments to **BS EN 14844:2006+A2:2011** Precast concrete products. Box culverts.

This amendment has been incorporated into an updated standard.

For purchase of this standard contact the SLBS at 453-0049 or email:

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## UPCOMING EVENTS

The Office of Private Sector Relations (OPSR) in fulfilling the role of the National Trade Export Promotion Agency, will be hosting a national business exposition dubbed "EXPO 2012".

Themed "Expect, Experience, Export the Best of Saint Lucia" this business exposition aspires to showcase the excellence and authenticity of Saint Lucian products and services to encourage local buying. The exhibition will run from the 21<sup>st</sup> to 23<sup>rd</sup> May 2012 for three (3) days and will be held at the Union Industrial Estate.

## "Quotable"s

US President Herbert Hoover, who was an engineer before he became a politician, said:

*The great liability of the engineer compared to men of other professions is that his works are out in the open where all can see them.*

*His acts step by step are in hard substances.*

*He cannot bury his mistakes in the grave like the DOCTORS.*

*He cannot argue them into thin air or blame the judge like the LAWYERS.*

*He cannot, like the ARCHITECT, cover his figures with trees and vines.*

*He cannot, like the politicians, screen his shortcomings by blaming his opponents and hope the people will forget. The ENGINEER simply cannot deny he did it.*

*If his works do not work he is damned.*



**APESL**

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