

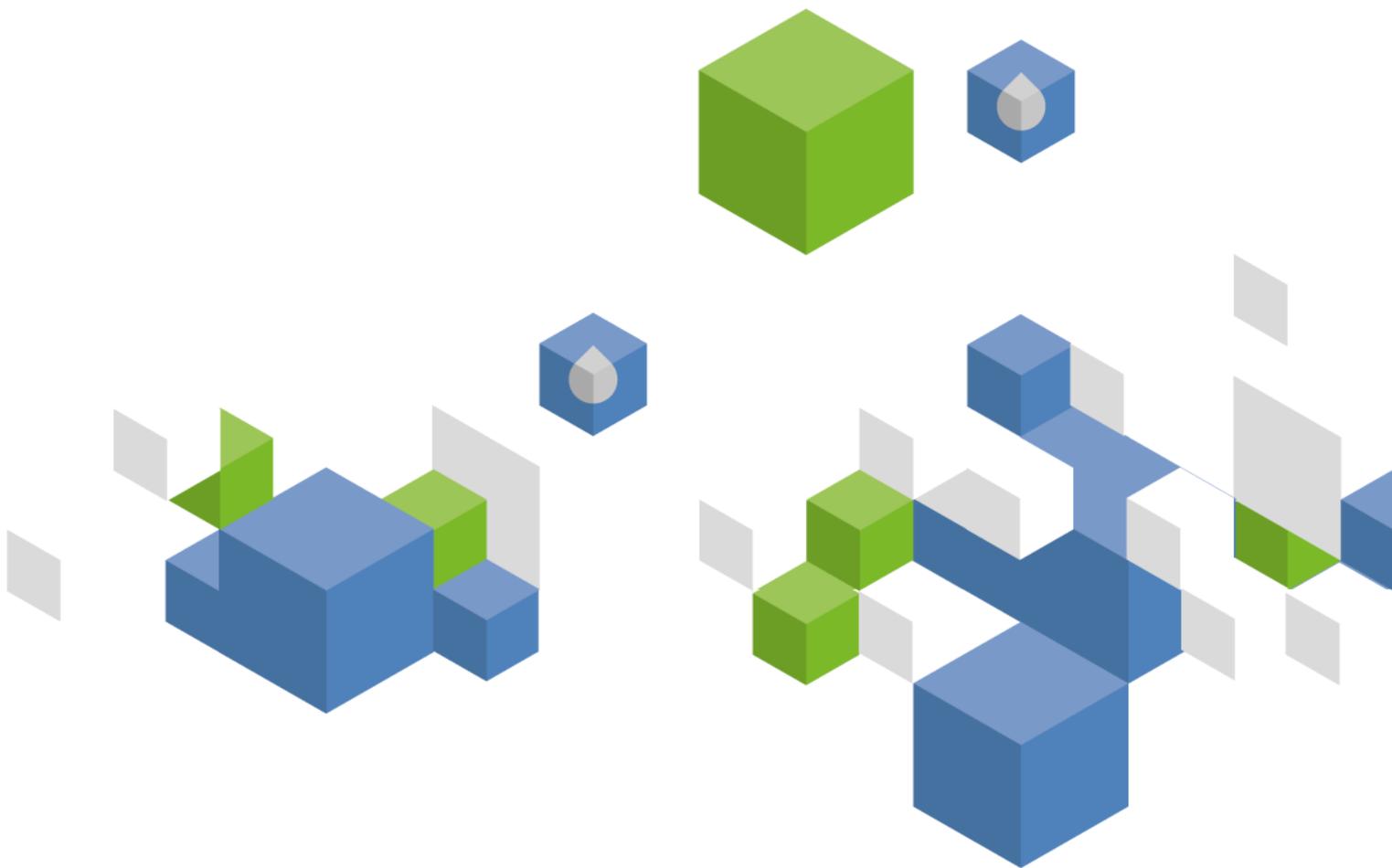


Food and Agriculture Organization
of the United Nations

FAO
AQUASTAT
Reports

Country profile – Saint Lucia

Version 2015



Recommended citation: FAO. 2015. AQUASTAT Country Profile – Saint Lucia.
Food and Agriculture Organization of the United Nations (FAO). Rome, Italy

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via www.fao.org/contact-us/licencerequest or addressed to copyright@fao.org.

FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org.

© FAO 2015

Saint Lucia

GEOGRAPHY, CLIMATE AND POPULATION

Geography

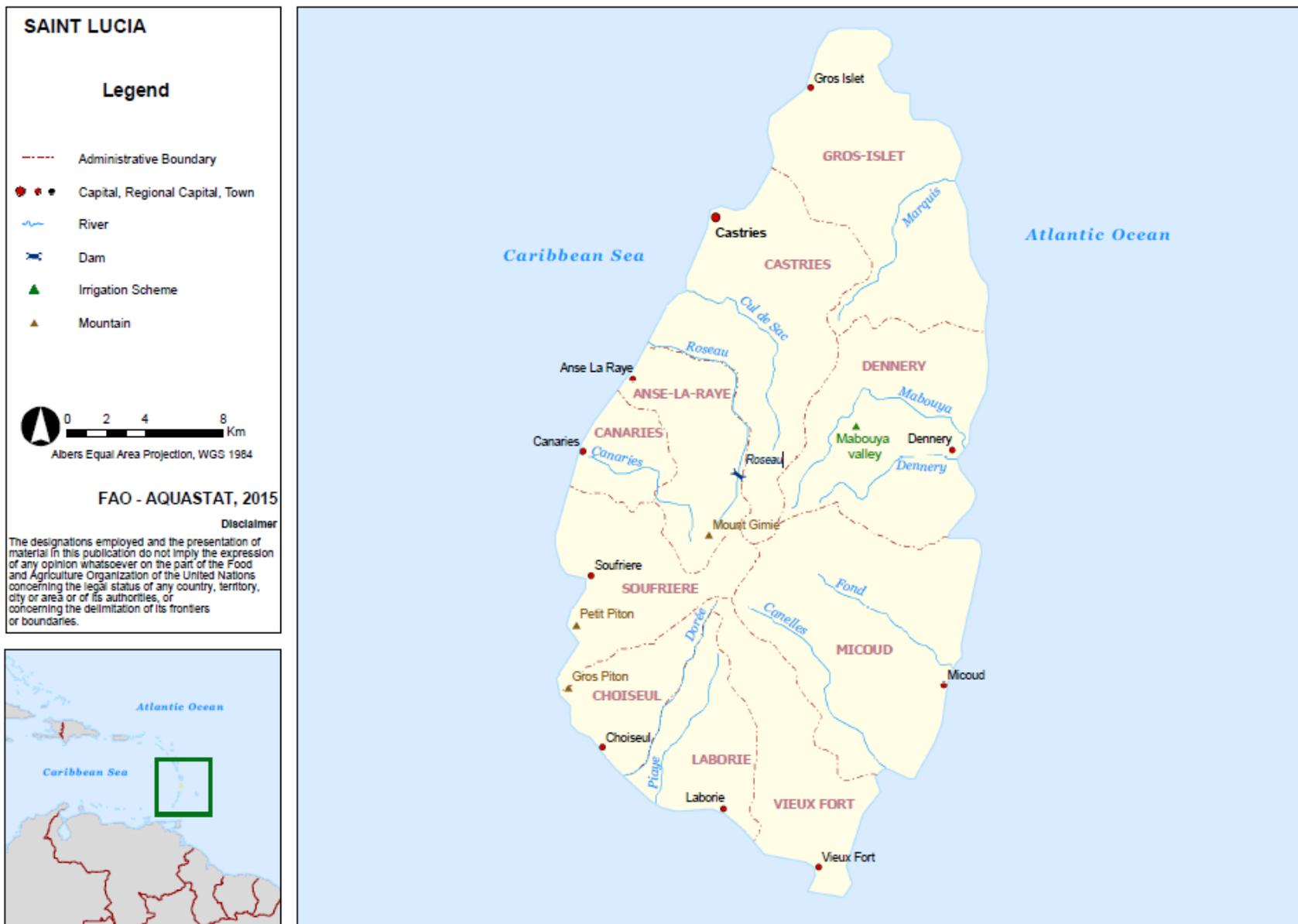
Saint Lucia is a Small Island Developing State (SIDS) at latitude 13°59'N and longitude 60°59'W within the Lesser Antillean Arc of the Caribbean Archipelago. With a total area of 620 km², it is the second largest of the Windward Islands after Dominica. The island is about 42 km long and 22 km wide. Saint Lucia is politically divided into 10 districts. The capital is Castries.

The island boasts very fertile volcanic soils but due mainly to topographic constraints only 28 percent of the total land area, or 17 360 ha, has been classified as suitable for agriculture. In 2012, the total physical cultivated area was estimated at 10 000 ha, of which 70 percent (7 000 ha) consisted of permanent crops and 30 percent (3 000 ha) of temporary crops. Permanent meadows and pasture cover 600 ha, which brings to total agricultural area to 10 600 ha (Table 1).

TABLE 1
Basic statistics and population

Physical areas:			
Area of the country	2012	62 000	ha
Agricultural land (permanent meadows and pasture + cultivated land)	2012	10 600	ha
• As % of the total area of the country	2012	17	%
• Permanent meadows and pasture	2012	600	ha
• Cultivated area (arable land + area under permanent crops)	2012	10 000	ha
- As % of the total area of the country	2012	16	%
- Arable land (temp. crops + temp. fallow + temp. meadows)	2012	3 000	ha
- Area under permanent crops	2012	7 000	ha
Population:			
Total population	2013	182 000	inhabitants
- Of which rural	2013	84	%
Population density	2013	294	inhabitants/km ²
Population economically active	2013	89 000	inhabitants
• As % of total population	2013	49	%
• Female	2013	42	%
• Male	2013	58	%
Population economically active in agriculture	2013	17 000	inhabitants
• As % of total economically active population	2013	19	%
• Female	2013	24	%
• Male	2013	76	%
Economy and development:			
Gross Domestic Product (GDP) (current US\$)	2013	1 332	million US\$/year
• Value added in agriculture (% of GDP)	2012	4	%
• GDP per capita	2013	7 320	US\$/year
Human Development Index (highest = 1)	2013	0.714	-
Gender Inequality Index (equality = 0, inequality = 1)	-	-	-
Access to improved drinking water sources:			
Total population	2012	94	%
Urban population	2012	99	%
Rural population	2012	93	%

FIGURE 1
Map of Saint Lucia



Saint Lucia is situated on a volcanic ridge connecting to Martinique in the north and Saint Vincent and the Grenadines in the south. The island has a very steep, rugged landscape, characterized by a centrally located north-south oriented mountain range, deep valleys and fast flowing rivers. The highest point on the island is Mount Gimie, which stands 950 m above sea level, while the most spectacular landmarks are the Pitons, which were inscribed on the World Heritage List in 2004. These two volcanic spires rise side by side from the sea to heights of 770 m and 743 m respectively, and are the focal points of the Pitons Management Area.

Climate

Saint Lucia lies within the northeast Trade Wind belt and is normally under an easterly flow of moist, warm air. Under normal circumstances, the island's weather is influenced by synoptic weather systems such as the Atlantic High Pressure system (Bermuda Azores), surface, mid and upper level low pressure systems, the Inter-Tropical Convergence Zone, tropical waves and cyclones, and the occasional frontal system.

Saint Lucia has a tropical maritime climate characterized by warm air temperature, averaging approximately 28°C. This temperature rarely rises above 33°C or falls below 20°C. Temperatures are lowest in the months of December to March and highest around June to September. Temperature decreases with altitude.

The country has one wet season from June to November and one dry season from December to May. The amount of rainfall in the wet season is determined mainly by the frequency and intensity of tropical disturbances, such as waves, depressions, storms and hurricanes. There is also some rainfall in the dry season, originating from mid-latitude systems intruding into the region, such as troughs, frontal troughs and jet streams. The intrusion of the dry season rain-producing systems is randomly distributed temporally, thus highly variable over time. The tropical disturbances in the wet season tend to occur with a predictable frequency of roughly one day in every four days. The geographic influence of rainfall is quite pronounced, varying from about 1 265 mm/year in the relatively flat coastal regions to about 3 420 mm/year in the elevated interior region. The western side of the island experiences higher rainfall. Average long-term annual rainfall at country-level is estimated at 2 300 mm.

Population

In 2013, the total population was about 182 000 inhabitants, of whom around 84 percent was rural (Table 1). Population density is 294 inhabitants/km². The average annual population growth rate during 2003-2013 has been estimated at 1.2 percent. The population is concentrated along the coastal regions, where lowland agriculture, coastal resources, reefs, fisheries and tourism are the main sources of livelihood. Approximately 60 percent of the population resides along the north-west corridor, where also the capital is located.

In 2012, 94 percent of the total population had access to improved water sources (99 and 93 percent in urban and rural areas respectively). In 2011, 65 percent of the total population had access to improved sanitation (70 and 64 percent in urban and rural areas respectively).

ECONOMY, AGRICULTURE AND FOOD SECURITY

In 2013, the gross domestic product (GDP) was US\$ 1 332 million. In 2012, agriculture accounted for 4 percent of GDP, while in 1992 it accounted for 13 percent. Since 1990 the economy has undergone a structural adjustment that saw the service sector, and in particular tourism, leading economic growth. Between 1990 and 2006, the contribution of the tourism sector moved from 9 percent to 13 percent. At present, the economic growth and development is centred around tourism, agriculture, infrastructural development and commercial sectors, with tourism being at the centre of the thrust.

Whereas the contribution of agriculture to GDP is likely to show further decline because of emerging external market conditions, the sector will remain a key component of the local economy for employment generation, foreign exchange earnings and food security as well as to retard urban drift. In 2013, total population economically active in agriculture is estimated at 17 000 inhabitants (19 percent of economically active population), of which 24 percent is female and 76 percent is male.

The government has approved a National Vision Plan which is a sector development plan that represents, in broad terms, the development priorities for each of the four main regions of the country. It is a broad-based land use plan developed to support the expansion of the tourism infrastructure, of housing and of industry, as well as to support some measure of environmental sustainability.

WATER RESOURCES

Surface water and groundwater resources

The island has an average annual precipitation of 2 300 mm, or 1 427 million m³ and renewable water resources are estimated at about 300 million m³/year (Table 2).

TABLE 2
Renewable water resources

Renewable freshwater resources:			
Precipitation (long-term average)	-	2 300	mm/year
	-	1 427	million m ³ /year
Internal renewable water resources (long-term average)	-	300	million m ³ /year
Total renewable water resources	-	300	million m ³ /year
Dependency ratio	-	0	%
Total renewable water resources per inhabitant	-	1 648	m ³ /year
Total dam capacity	2009	3	million m ³

Saint Lucia is of volcanic origin with a number of rivers, wetlands, streams and springs. Based on the drainage networks of the island, the landscape has been divided into 37 watershed basins, from which a number of perennial streams emanate. The most important rivers in the country are Cul de Sac, Canelles, Dennery, Fond, Piaye, Doree, Canaries, Roseau, and Marquis.

Surface water catchments areas are supply areas for drinking water. They are relatively small and characterized by steep terrain over which runoff occurs fairly rapidly resulting in limited percolation. Surface water yields for drinking water purposes vary due to increased abstraction.

Lakes and dams

In 2009, total dam capacity in Saint Lucia was estimated at 3 million m³. The most important dam is the Roseau dam with a reservoir capacity of 2.6 million m³.

Saint Lucia has no important lakes.

WATER USE

A rapidly increasing population and growing tourism sector during the last decades have resulted in significant increases in water withdrawal and consumption. This led to the commissioning in 1995 of a new water supply system to serve the northern half of the island. The main component of the system included a 3 million m³ storage facility, designed to satisfy the demands for domestic, industrial, commercial, hotel and institutional supply.

At present, the country's water supply comes from 4 major water supply systems (WSS) and some 19 minor water supply systems. The northern part of the island is served by the Roseau Dam/Theobalds Plant WSS and Hill 20 WSS and the southern part is served by the Grace WSS and Beausejour WSS.

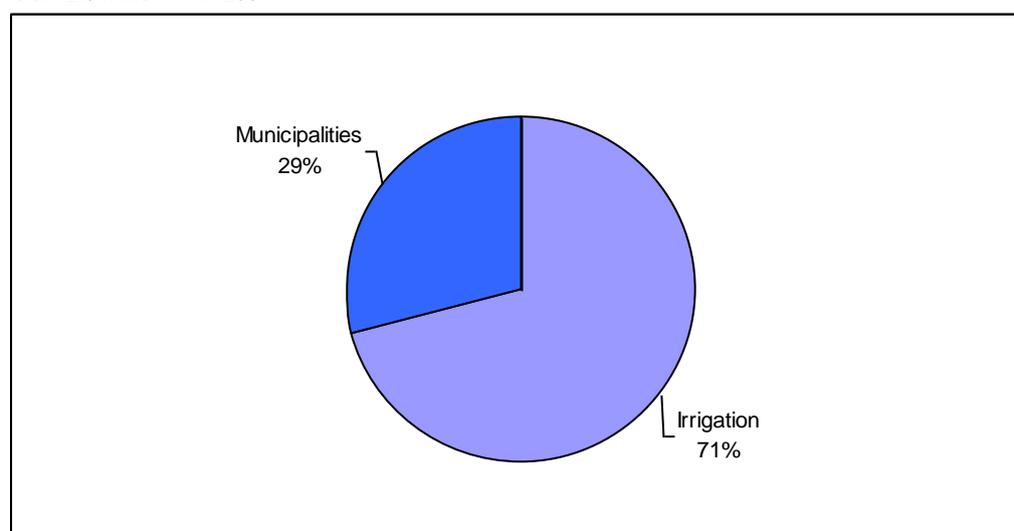
The raw supply from the abstraction points to the treatment plants is transmitted via both gravity and pumped conveyance systems. The above-mentioned systems treat the raw water in filtration plants followed by disinfection. According to the Water and Sewerage Company (WASCO), in 2010 the water production capacity from the various water supply systems island wide was 72 392 m³/day or 26.4 million m³/year.

Water resources in Saint Lucia are exploited for municipal and agricultural purposes. In 2007 total water withdrawal was estimated at 42.9 million m³ of which 12.5 million m³ (29 percent) for municipalities (Table 3 and Figure 2). In 2007, surface water accounted for 100 percent of the total withdrawals. Attempts to develop groundwater for public supply have had very limited success on the island. A 1998 study on improved water supplies for the south of the island concluded that this source is unlikely to make a significant contribution except in small isolated rural communities through the use of hand pumps.

TABLE 3
Water use

Water withdrawal:			
Total water withdrawal	2007	42.9	million m ³ /year
- Agriculture (Irrigation + Livestock + Aquaculture)	2007	30.4	million m ³ /year
- Municipalities	2007	12.5	million m ³ /year
- Industry	2007	0	million m ³ /year
• Per inhabitant	2007	252	m ³ /year
Surface water and groundwater withdrawal (primary and secondary)	2007	42.9	million m ³ /year
• As % of total actual renewable water resources	2007	14	%
Non-conventional sources of water:			
Produced municipal wastewater	-	-	million m ³ /year
Treated municipal wastewater	-	-	million m ³ /year
Direct use of treated municipal wastewater	-	-	million m ³ /year
Direct use of agricultural drainage water	-	-	million m ³ /year
Desalinated water produced	-	-	million m ³ /year

FIGURE 2
Water withdrawal by sector
Total 42.9 million m³ in 2007



Water demand continues to change rapidly in certain areas, such as for example in the extreme north due to high infrastructural development and migration of people into areas in the north and other major centers of commercial activity in the south.

Water outages occur regularly, and most people thus have installed water storage tanks.

IRRIGATION AND DRAINAGE

Evolution of irrigation development

During the period of the island's colonization, a number of aqueducts were built to serve the water needs of large estates in the important agricultural areas on the island. With the evolution of the banana industry, the larger estates were again quick to adopt the technology of the time and supplementary irrigation was applied utilizing large gun sprinklers. Very little attention was paid at the time to application and other irrigation efficiencies.

In 2000, a fairly large and well-managed irrigation system existed in Fond State, used to support the production of a wide range of crops, including bananas, pineapples and vegetables. In addition, there was a centrally organized scheme in the Mabouya Valley in the centre-east and there were a few individual small farm systems. Around two-thirds were large holdings of more than 15 ha each. Methods of application included drip and sprinklers as well as flooding of field drains.

In 2007 the area equipped for irrigation was estimated at 3 000 ha (Table 4).

TABLE 4
Irrigation and drainage

Irrigation potential	-	-	ha
Irrigation:			
1. Full control irrigation: equipped area	2007	3 000	ha
- Surface irrigation	-	-	ha
- Sprinkler irrigation	-	-	ha
- Localized irrigation	-	-	ha
• Area equipped for full control irrigation actually irrigated	-	-	ha
- As % of area equipped for full control irrigation	-	-	%
2. Equipped lowlands (wetland, ivb, flood plains, mangroves)	-	-	ha
3. Spate irrigation	-	-	ha
Total area equipped for irrigation (1+2+3)	2007	3 000	ha
• As % of cultivated area	2007	32	%
• % of area irrigated from surface water	2007	100	%
• % of area irrigated from groundwater	2007	0	%
• % of area irrigated from mixed surface water and groundwater	2007	0	%
• % of area irrigated from non-conventional sources of water	2007	0	%
• Area equipped for irrigation actually irrigated	-	-	ha
- As % of total area equipped for irrigation	-	-	%
• Average increase per year	-	-	%
• Power irrigated area as % of total area equipped for irrigation	-	-	%
4. Non-equipped cultivated wetlands and inland valley bottoms	-	-	ha
5. Non-equipped flood recession cropping area	-	-	ha
Total agricultural water managed area (1+2+3+4+5)	2007	3 000	ha
• As % of cultivated area	2007	32	%
Size of full control irrigation schemes: Criteria:			
Small schemes	< - ha	-	ha
Medium schemes	> - ha and < - ha	-	ha
large schemes	> - ha	-	ha
Total number of households in irrigation	-	-	
Irrigated crops in full control irrigation schemes:			
Total irrigated grain production	-	-	metric tons
• As % of total grain production	-	-	%
Harvested crops:			
Total harvested irrigated cropped area	-	-	ha
• Temporary crops: total	-	-	ha
• Permanent crops: total	-	-	ha
Irrigated cropping intensity (on full control area actually irrigated)	-	-	%

TABLE 4 (Continued)
Irrigation and drainage

Drainage - Environment:			
Total cultivated area drained	-	-	ha
• Non-irrigated cultivated area drained	-	-	ha
• Area equipped for irrigation drained	-	-	ha
- As % of total area equipped for irrigation	-	-	%
Area salinized by irrigation	-	-	ha
Area waterlogged by irrigation	-	-	ha

Role of irrigation in agricultural production, economy and society

Irrigated crops include bananas, vegetables, a limited amount of tree crops and some pasture.

A prefeasibility study on small-scale irrigation, conducted by FAO in 1998, estimated that the investment cost for irrigation schemes ranged from US\$6 400 to US\$16 000 per ha (the higher cost refers to a gravity-fed system). Annual operating costs were estimated at US\$475 per ha for a typical sprinkler pumping scheme, with maintenance costs estimated at US\$125 per ha for the same scheme and US\$90 per ha for a gravity-fed scheme.

Women and irrigation

Women in the agricultural sector are in general untrained and low-skilled. However, in recent years a growing number of women have received training in different institutions and have pursued graduate training in the Faculty of Agriculture at the University of the West Indies (UWI). In spite of this, there is still a division of labour within the sector and women are mostly engaged in subsistence farming while men are engaged in commercial farming. Several research projects have helped to expand the database on rural women and on women in agriculture (Ellis, 2003).

Many rural development projects have focused on women and provided them with training and other resources to improve their condition and enhance their role in rural development. This is the case of the Canada Fund for Local Initiatives (CFLI) project that was designed to provide support to the rehabilitation and revitalization of non-banana agriculture and agri-business in the four most vulnerable communities of Saint Lucia - Babonneau, Roseau/Anse La Raye, Dennery and Micoud-, in the aftermath of Hurricane Dean (2007) focusing on women and youth. A database with beneficiary profiles has been created that includes information on water access and water for irrigation (IICA, 2008).

Status and evolution of drainage systems

Banana is the primary crop grown in Saint Lucia and because this crop does not tolerate waterlogging, farmers in the valley bottoms have over the years come to appreciate the need for proper in-field surface drainage. Contour drainage is also widely practiced on hillside farms. In all cases, drainage is designed for the discharge of stormwater runoff and not for draining excess irrigation water application. While farmers are generally able to manage their in-field drainage systems, problems arise because the bed levels of streams and rivers, which serve as outlets to these systems, are getting increasingly silted.

WATER MANAGEMENT, POLICIES AND LEGISLATION RELATED TO WATER USE IN AGRICULTURE

Institutions

The Water and Sewerage Company Inc. (WASCO), former Water and Sewerage Authority (WASA), is a government-owned company mandated by law to develop and manage the water supply and sewerage services in Saint Lucia. While it is generally assumed otherwise, WASCO has no legal rights to water over persons in possession of land riparian to a stream or above a groundwater source. The mission of this institution is to (WASCO, 2015):

- promote collaboration, continuous learning, training and development of its human resources
- emphasize accountability
- use appropriate technology and business processes
- deliver a consistent, safe and reliable water and waste water services
- resulting in excellent customer care and financial viability within a sustainable environment

The Water Resources Management Agency (WRMA) within the Ministry of Agriculture, Food Production, Fisheries, Cooperatives and Rural Development, which became functional in 2008, seeks to enable the sustainability of economic growth, human development and the environment by promoting and facilitating the efficient and effective use and management of water resources in Saint Lucia.

Water management

The government enabled the birth of WRMA at a time when the water resources of the country needed to be managed efficiently, due to the impending water stress and possible crisis. The sustainable management of the country's water resources is the primary objective and mandate of WRMA. This can be achieved through an integrated approach in which all stakeholders participate in the activities and decision-making related to water resources management.

In order to improve the water resources management in the county, WRMA will: strengthen its framework with respect to the monitoring of water quality and quantity, promote and coordinate research on water issues, sustain and provide assessments of weather, climate and hydrological data, ensure the accuracy and integrity of primary data on the state of water resources and evaluate the total economic value of these resources.

Policies and legislation

The most important legislation related to water resources in Saint Lucia is the Water and Sewerage Act (revised edition of 2008).

ENVIRONMENT AND HEALTH

Inappropriate land use and management is a central factor contributing to environmental degradation in Saint Lucia. As a consequence of current practices, increased stress on natural resources and biodiversity is evident, as are some of the consequences such as diminished food and water productive capacities through degradation of the terrestrial and marine environments. In addition the absence of effective forward planning, coupled with the ineffective enforcement of existing laws, is contributing to the growth of unplanned settlements, increased incidence of settlements in unsafe areas such as steep hillsides and flood plains, deforestation and poor building standards. In the long term, it is expected that soil fertility will be affected and sedimentation of the near shore marine environment will be accelerated. In 2009, the government approved a National Vision Plan which seeks to rationalize land use throughout the country.

Development of the agricultural sector, propelled by preferential arrangements for the export of bananas, brought with it the development of more marginal lands in the upper catchment areas. This development has resulted in extensive denudation of these catchment areas and an attendant loss of vegetative cover on the steep slopes, an increase in the incidence of landslides, soil erosion and siltation of drainage systems in the valley bottoms and ultimately, increased incidence of flash flooding.

In some cases there is soil and chemical contamination in surface water resources.

PROSPECTS FOR AGRICULTURAL WATER MANAGEMENT

The government is working on a roadmap, which will include the development of a national integrated water resources management (IWRM) plan. This IWRM roadmap is expected to provide guidelines for the management of water resources. There are also several initiatives underway in the areas of environment and water (CEHI, GEF–IWCAM, 2008).

MAIN SOURCES OF INFORMATION

CEHI, GEF–IWCAM. 2008. *Towards the preparation of an Integrated Water Resources Management (IWRM) plan - Roadmap Saint Lucia.* Caribbean Environmental Health Institute, Global Environment Facility – funded Integrating Watershed and Coastal Areas Management Project.

CEHI. 2010. *Roadmap for the preparation of an IWRM Plan for Saint Lucia.* Caribbean Environmental Health Institute.

Encyclopedia of the nations. 2015. *Saint Lucia.*

Elliott, L. V. 2014. *Water and sewerage (water trucks potable water transportation standards) regulations.*

Ellis P. 2003. *Women, gender and development in the Caribbean.* Reflections and projections.

FAO. 1998. *Prefeasibility study for small-scale irrigation.* Report/98/082 TCP-STL. Rome.

Governement of Saint Lucia. 2009. *Water management plan for drought conditions.*

IICA. 2008. *Annual report 2008. Saint Lucia - IICA's Contribution to Agriculture and the Development of the Rural Communities in Saint Lucia.* Inter-American Institute for Cooperation on Agriculture

Ministry of Agriculture, Food Production, Fisheries, Cooperatives & Rural Development. 2015. *Water Resources Management Agency.*

Norville, P., King, S., Water Resources Management Unit, Ministry of Agriculture. 2001. *Integrating the management of watershed and coastal areas in Saint Lucia.*

Robertson, L. and Daniel, A., CEHI/UNEP-RCU. 2009. *Financial assessment for wastewater treatment and disposal in the Caribbean.* Assessment study funded by UNEP.

SDED. 2011. *Saint Lucia Second National Communications to Climate Change.* Sustainable Development and Environment Division, Ministry of Physical Development & the Environment of the Government of Saint Lucia.

WASCO. 2015. *Website of WASCO.* Water and Sewerage Company Inc.

World Bank. 2014. *World Bank indicators land use Saint Lucia.*

WorldStat Info. 2007. *Land use in Saint Lucia.*