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WATER AND AGRICULTURE SUSTAINABILITY IN TAMIL NADU: FEATURES AND CONSTRAINS

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Abstract

This article mainly focused how the water is major source for agricultural sustainability in Tamil Nadu, and also reveals the features and constrains to achieve the goals. In September 2015, the world countries around 193 have gathering in United Nations General Assembly (UNGA) and embrace Sustainable Development Goals (SDGs). It brought with 17 goals, 169 targets and more than 300 global indicators, effects from 01.01.2016. Among the targets, the foremost for the survival of the world and human population are water then agriculture. Human population has survived in the water bodies, especially the rivers. All the civilization are emerged from the water bodies and named in river bodies. Human needs water for drinking (pure water), cultivation (agricultural needs), hygiene(to use water), climate(maintain), and power(hydrology). Among them, agriculture took more water for cultivation. In Tamil Nadu, paddy is the important commodity which needs so much water. Indeed, Tamil Nadu has received more rain to compare with other states in India. But the lack of conservation, negligence would lead constrains which lacking to fulfill the needs of the people, especially cities like Chennai (capital of Tamil Nadu). World countries have travelled to achieve the sustainable goals in 2030 in all fields, also the water resources. The innovative steps and programmes only made achievement of water potential in future.

Keywords: *Water potential, Sustainable development, agricultural sustainability, crop cultivation*

Introduction

Agriculture is the backbone of the Indian economy which depend the water resources. Rain is the major source of water, and it irrigated through sea on agricultural lands. The river water conserves in the form of Dams, and Check dams. Then it irrigated to the agricultural lands via canals. This chain is broken, the entire agricultural sustainability diluted. The proper conservation of water is only the survival of agriculture and human development in the modern era. Hence, the river has been termed as 'mother river', 'sacred river', and 'Holy River'. India has consisted second largest population, which need much effect to fulfill the basic needs, especially foods. Tamil Nadu, a state from India, invariably forefront in the process of sustainable development. The implementation of schemes and programmers are for saving the water from rain, conservation for the agricultural needs. The only way to achieve the sustainable goals, to save the water and conserve the water for agriculture, hygiene, drinking purpose would be help for the human for surviving long period. This article mainly focused how the water is major source for agricultural sustainability in Tamil Nadu, and also reveals the features and constrains to the achieve the goals.

Tamil Nadu

Tamil Nadu has geographically blessed with largest coast line, eleventh largest State (in size), with 13 million hectares, located southern side of Indian sub-continent. Also having largest fertile or sown areas covered 6 million hectares, also advanced with irrigation facilities from sources, Government canals (0.95 MHa), Tanks(0.95 MHa), Tube wells and Wells(1.15 Ha). Tamil Nadu has possessed 5.96 % of the population in India (around 7.21 crore)[1], occupies 4% percent of the land and 3 % of the water resources. Tamil Nadu has total surface of water is around 24864 m cum or 36 km. Also it has consisted seventeen major river basins, 61 reservoirs and 41,948 tanks.[2] It has possessed water potential around 46540 million cubic meters (MCM). The irrigation is primary user for the water, and utilized around 90 percent. The people from Tami Nadu mostly made diet with rice, and it need lots of water for the sustainable development to the path of zero hunger and abolish poverty ever.

Sustainable Goals

In September 2015, the world countries around 193 have gathering in United Nations General Assembly(UNGA) and espouse Sustainable Development Goals (SDGs. It brought with 17 goals, 169 targets and more than 300 global indicators, effects from 01.01.2016. Among the targets, the foremost for the survival of the world and human population are water then agriculture. Sustainable goals (SDGs target No. 6.6) to Preserve and conserve water correlated ecosystems, together with mountains, wetlands, forests, rivers, lakes and .aquifers [3] The State Government of Tamil Nadu construct several steps to the path of sustainability and implement innovative steps to achieve the goals on 2030. While development meant "improvement on the past' and also refers to

how to manage the future.[4] Mahatma Gandhi quotes, "The Earth, The Air, The Land and The water are not an inheritance from our fore fathers but on loan from our children. So we have to handover to them at least as it been handed over to us". Tamil Nadu has many resources to compare with other districts but still has lacking over the conservation and safeguarding water resources over the years.

Tamil Nadu water resources

Water is the important factor to produce the needful crops in agriculture fields. Both internal and external cultivation of the lands solemnly depend the reservation of water. The irrigation techniques and programmes implemented by the State Government of Tamil Nadu helpful to enhance water inundation, especially agriculture purpose. The numerous sources of inundation like spring, open well, tube well, tank and canals.

Table No.1: The Number of sources of irrigation is furnished in the following table

			No		
S.No	**Sources**	Nature	Government	Private	Total
1	CANALS		2237	2	2239
2.	RESERVOIRS		78		78
3.	TANKS	a)Ayacut above 40 ha.			7984
		b)Ayacut below 40 ha.			33278
4.	TUBE WELLS		689	305277	305966
5.	OPEN WELLS		472	1529617	1530089
Total					**1879634**

Source: Season and crop Report of Tamil Nadu 2009-2010[5]

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A State has getting sufficient water from rainfall which falls 937.55 averagely, which compared 2/3 of countries rainfall average around 1200 mm. However, the process of conservation techniques still not reached well.

Table No. 3: Season wise rainfall-2020

S. No	**Season**		**Rainfall(mm)**				**% of variance**	
		Normal	**2018**	**2019**	**2020**	**Normal**	**2018**	**2019**
1	Winter(January-February)	28.0	16.7	4.9	10.0	-64	-84.3	104
2	Summer(March-May)	125.5	154.1	50.7	75.8	40	-60.5	50
3	South West Monsoon(June-September)	336.0	282.9	396.7	424.4	26	+15.9	7
4	North East Monsoon(October-December)	448.0	336.	457.7	480.3	7	+1.8	6
	Total	937.5	790.2	907.0	990.5	6	-4.4	9

Source: Indian Meteorological Department [6]

The Temperature might one among the important factor deciding the requirements of water depend upon the crop. The climatological station has observed the minimum and maximum average of temperature, which has called relative humidity. Relative humidity has taken to finding the pressure of water vapor and result determines temperature. This could be related to the pressure of the system..[7]

Agriculture

Agriculture is the paramount importance of any nation, also the state of Tamil Nadu. The protection of agriculture and accelerate occurrence might be the prominent goal for the Government. People are inhabited in the rural areas completely depends on the agricultural enhancement. The numerous factors restrain the agricultural enhancement like conversions of land, water sanctity, flood, famine, pesticide usage, and seasonal rainfall. The Sustainable Goals had to made effort to revise the profitable and sustainably method which used for future generations without any discrepancy.

Table No.2: Land Use pattern in Tamil Nadu 2019-20

S. No	**Details**	**Area(Lakh Ha)**	**%with reference to total Geographical area**	**Area(Lakh Ha)**	**%with reference to total Geographical area**
1	Forest	21.57	16.55	21.57	16.55
2	Net cropped Area(*)	45.82	35.16	47.38	36.35
3	Area under Misc Tree crops	2.26	1.73	2.21	1.70
4	Permanent fallow	1.08	0.83	1.08	0.83
5	Current fallow	10.47	8.03	9.20	7.06
6	Other fallows	19.30	14.81	19.06	14.62
7	Culuralble waste land	3.23	2.48	3.22	2.48
8	Land put to non agricultural use	22.02	16.90	22.03	16.90
9	Barren and unclutrable land	4.58	3.51	4.58	3.51
Total Geographical Area		130.33	100.00	130.33	100.00
Cropping intensity (%)		125.41		125.41	

Source: Department of Economics and Statistics, Government of Tamil Nadu[8]

Tamil Nadu is largely dependent on rainfall for the successful pursuit of agriculture, as it has very few perennial rivers.[9]

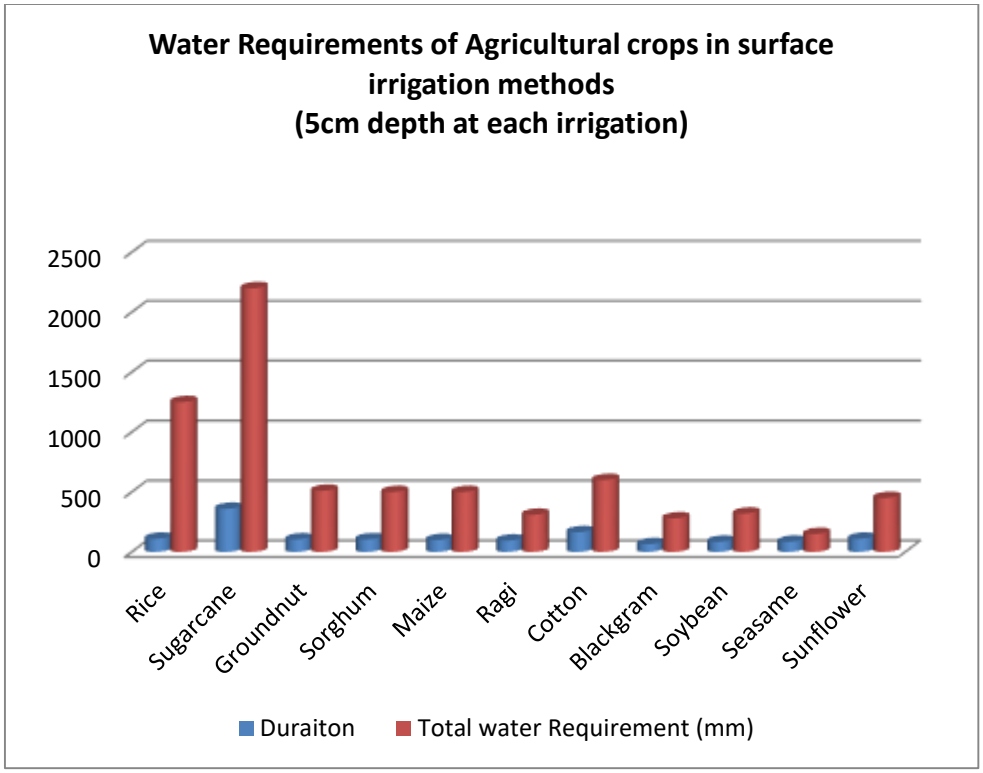
Crop cultivation

Tamil Nadu has unique food culture with other Indian states; the majority of the people take rice as prominent food in their menu. Indeed, this land is potential to cultivate the paddy crop in huge manner. Other than paddy, there are other commodities cultivated in Tamil Nadu, such as cotton, millets, seeds, sugarcane and pulses.

Paddy has cultivated almost all the district from Tamil Nadu with unique seasonal pattern. They are:

S.No	Season(Name)	Month
1	Kuruvai	April to July
2	Pishanam	August to Novemeber
3	Kodai	December to March

The State of Tamil Nadu enables to cultivate the paddy and has climatic advantages which covered normal area of 18.50 Lakh Ha. Moreover, it has potential to production of 70.72 lakh MT after the innovative plans and techniques. Other than paddy, the pulses given more source of diet which are the second important constituent in Tamil Nadu. The pulsed are cultivated in Tamil Nadu namely Horse gram, Red gram, Bengal gram, Black Gram and Green gram. The sustainable cotton cultivation programme has getting prominent result which covered 25,000 ha of land, and given benefit of Rs. 83 lakh.[11]



Source[12]

About the thirty six percent of the paddy sown and cultivated in the delta districts has consisted Cuddalore, Ariyalur, Karur, Pudukkottai, Trichy, TIruvarur, Nagapattinam, and Thanjavur. The Cuddalore is the delta district of both Pennar and Gadilam. [13]

Conclusion

Human population has survived in the water bodies, especially the rivers. All the civilization are emerged from the water bodies and named in river bodies. Human needs water for drinking (pure water), cultivation (agricultural needs), hygiene(to use water), climate(maintain), and power(hydrology). Among them, agriculture took more water for cultivation. In Tamil Nadu, paddy is the important commodity which needs so much water. Indeed, Tamil Nadu has received more rain to compare with other states in India. But the lack of conservation, negligence would lead constrains which lacking to fulfill the needs of the people, especially cities like Chennai (capital of Tamil Nadu). World countries have travelled to achieve the sustainable goals in 2030 in all fields, also the water resources. The innovative steps and programmes only made achievement of water potential in future.

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