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CAUVERY DELTA HYDROLOGY: FACTORS AND FUNCTIONS

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ABSTRACT

Water depletion and repletion are issues which need some attention. Considering the low resource levels due to deforestation and other anthropogenic activities, water harvesting in any form is important to save the blue Planet that we are in. Cauvery delta has been a well flourishing delta, for the morphological factors are really conducive, aiding to its freshness and fullness. The descending mean sea level right from Talakaveri to Poompohar furthermore increases its flourishing nature. This paper deals with Cauvery delta hydrology, stressing thrust more on how Cauvery can be ever-flowing, well- flourishing, even when there is a possibility of scarcity in water and how the monsoonal help that Cauvery gets, adds to its strength. Provided there is an intact water management and proper plantation of trees, river Cauvery can be as fertile and well-flowing, aiding the agricultural activities.

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INTRODUCTION

This paper attempts to focus on the water-cycle in the delta-zone of Cauvery River being largely governed by geological and chronological factors which almost have fixed the features of cycles relating to repletion and depletion of water tables as on and off processes in the specified delta area where Cauvery river is nearly spent through branching and draining over the accumulated alluvia and silt, down the centuries. The underlining preposition, however, is that despite the river not drawing enough water in the recent decades from the catchments and the dams of Tamil Nadu and Karnataka, the core invariant hydrology persists and acts implicitly, safeguarding the 'delta' bed from turning arid. In other words, river Cauvery, though dry, her delta beds would draw upon hydrologic prospects from above and below the delta-bed without serious deficit; and depletions shall be compensated by repletion through a time-scale, provided anthropogenic undertakings do not interfere with and crinkle the delta-bed in an indiscriminate manner.

MATERIALS AND METHODS

Even to admit the proposition, which none the less is not hypothetical, which by a decade's experience from 2000-10

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is almost proven, some aware groundings and perspectives are called for in terms of geographic scrutiny. Though all entities in the scrutiny cannot be obtained by the researcher at a pinch, a few of them obvious and unobvious would serve the purpose. Under the obvious entities are surface and map based information relating to the river; the unobvious are calibrated. Calibrate and consolidated info, relating to the Deccan plateau West to East and the tropical atmosphere in general; the former pitch on the geologic and the later on climatologic. Of these two, a limited number of factors and functions alone are invoked to admit the proposition and hypothetically validating it for onward analysis. These factors and functions include:

DISCUSSION

- The plateau's overall sloping with the western mountainous zones gorging up and the eastern estuary zones dipping down.
- The relative humidity and the max-min temperatures of places situated on the Cauvery-riverine zone from start to finish.
- The latitude and the longitude of the places through which the Cauvery riverine zone stretches.
- The average annual rainfall proper to the places within the zone.
- The soil nature of the places.

- The recurrent pattern of bi-annual seasons and the pattern of sporadic showers that yield to forecasting in these places of Cauvery riverine zone.
- The monsoons and their moves around the summer and the winter solstice turns as well around the spring and autumnal equinoxes.
- The impact of these moves upon the delta of Cauvery from Trichy to Poompuhar.
- Afforestation and deforestation on delta: trends
- Agricultural operations and seasonings the relative decrease or increase.
- The average MSL (mean-sea level) of the places in the whole riverine route.
- The layers of water-tables utilized in number, in the places marked.
- The type of rock underlying the places on the riverine-route.
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- The type of rock underlying the places on the riverine-route.
- Oil rig or mining or such operations intrusive to impact the chthonic tectonic fixity of the riverine zone in general and the places in particular any.
- Agricultural density and the greening; industrial density and the consequent concretization in these places of late.
- Consumer population of water resources in these places: an approximate figure: as part of the floral and the faunal presence typical of these places.
- River bed utilization: especially sand quarrying.
- In respect of plateau's nature, the contours of the sandy plains in the places: the color of the soil, the major feature of the soil (Strahler, A.N. 1952), the water-absorbing, water-retaining potential of the soil in the places.
- The typical alluvial differentia and the silted enrichments down the century in the delta zone.
- The year-marked commotions and cloud convections, number of times approximately in a year, over the places; particularly in December-January and June-July in the delta-zone and the western locations: mere number of times of occurrence need be mentioned.

Of these, some are exclusively geological some climatological, some both or neither; anyway a cursory preview table of info of this kind will uphold the proposition as admissible to hypothetical enunciation. The enunciation: The Hydrological cycle of River Cauvery Delta is rather independent of Cauvery's itinerary and water allocation than thought of as endangered, and the cycle's continuance on the delta is in inverse proportion to the distance of the delta zone from the origin, the catchments and dams of Cauvery in the upland west of the Deccan plateau. The given: granted the temperatures and the pressures of the delta zone of Cauvery, the hydrological cycle's major processes go on and evaporation, transpiration, and precipitation are complemented by absorption, retention and repletion in the zone. The zone, delta, as it is over the years, with its natural vegetation, the greening it can hardly be totally devoid of, (unless anthropogenic hindrances in a massive scale occur), and with its locational prerogative of dependence on monsoons overly determined by adjoining seascapes the

Coromandel Bay of Bengal and the Arabian seas' Konkan, Karnataka, Kerala coast scape allows the cycle to go on; and consequent on this, the delimitation of ambiguity in the word 'depletion' of water-table in Cauvery delta-zone is reconciled with the fact that water-table depletions or vacuum would trigger other rates of absorption, retention and repletion, besides the average mean sea level difference from catchment zone to delta zone favoring a subterranean current to replete, though this process is slow and may be obstacle by earth-moving operations like mining, dam-construction and such enterprises. To help absorption, all forms of water-reserves - pools, lakes, water-ways, canals, dykes, puddles, tanks, frequent short-term greening, landscaping with plants, and limn logically rich river-side water-sheds, overall rain-harvesting done by the natural greening order, the knotty roots of old trees, the muck and the timber on the soil, the porous quality-promoting operations done by the fauna are in play. A planned harmonious effort on the part of human population to foster and preserve these natural endowments shall help greatly to resolve the ambiguity of the word 'depletion'. The beauty of water-table is its self-fulfilling, self-sustaining, self-vectoring 'currency' (it is currently decided by the property of water and earth it encloses and is enclosed by).

Now focusing on the delta-zone hydrology, the atmospheric cycle apart, which also finds its due place, the water-table cycle if we may call it so, is prone to be sustained by the factors (Mackay, 1963) geologic and climatologic in the specific regional sense and may be proved re-coursing to the following:

- (i) Delta's (River Cauvery) alluvial, silt nature partakes of the finer grains brought down through the western-Ghats of the plateau, and what the rocky accretion could not hold the finer grains could hold.
- (ii) The catchment zones of the tributaries with the catchment zones of Cauvery exert a hydrological pressure on the earth-strata proper to the montane and sub montane regions and cause a sub-terranean sub-way(route) to let water seep into and seep down onto the plains and delta's gravity upon the highland is irrevocably structured in a vertical top-down sliding.
- (iii) The equinox (Linton, D.L.1951, Chorley, R.J 1957) causing the monsoon-spells are complementary in so far as Cauvery delta is concerned as discernible from past experience: i.e. SWM + NEM in total is fairly a constant and their relative complementariness is never to be ruled out; but the annual rainfall may vary. What we call monsoon failure or delay is more a matter of our need and expectancy than the natural order subject to year-cycle and climatological periodicity (Curry, L. 1966).
- (iv) The biannual turns of Earth, celebrated as the half yearly ear-markings of sun's apparent tropisms (namely Uttarayanam, Dakshinaayanam (Northward, Southward) do cause commotions and cloud-convections) in the delta as felt and 30 to 40 sporadic spread over mini-rain-spells make do in the absence of the so called monsoon-deluging the west. SWM is normally viewed as a profusely active one while NEM is not so; but this is not totally true, what delta Cauvery zone misses, the other deltas in Andhra do get in years.

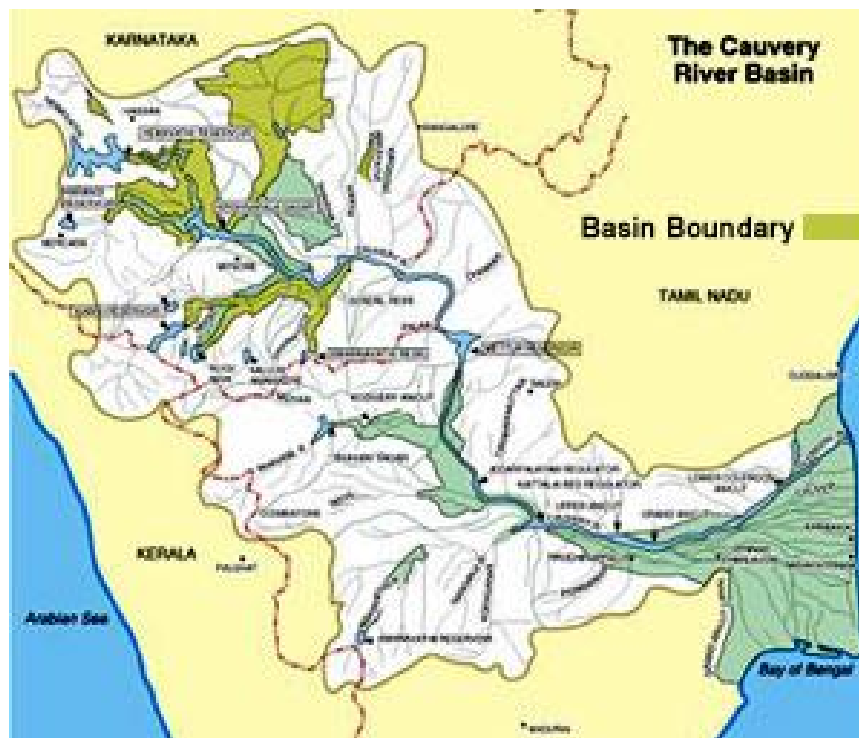
Hence a total drought is incompatible with monsoon-blessed deltas of Earth. This perhaps leans to a conservation theory of innate hydrology of any riverine region.

- (v) Plantations and digging wells and tanks have been a continuous service operation from early Cholas to the current times. If tank in one form is closed, it is adjusted by new water-scape created and water-ways deepened by People and the fauna of the land; and delta-zone is not exempted from such services. And an inner terrain –softening precipitation (Leighly, J.B.1954) during rains and moist times of weather occurs, invariably accounting for water-repletion in the tables-1 below.

- (vi) The pious attitude to river-water displayed through festivities of the folk of delta in particular, as invoking rains, worshipping rivers, implanting structures of worship needing water for daily ablution on the banks of tanks, rivers, lakes, and the like are a social complicity to the process of absorption and retention and such take place till date in Cauvery delta even though Cauvery is waterless at present when this paper is made in the delta zone. The substitute water-zones in the alluvial estuary are crowded on such festivities which of course synchronize with equinoctial lingering of Earth.
- (vii) The paper is sound in respect of the euphoric nature constantly endows with the delta in question; but

Table 1. Showing data relating to these aspects may promote a deeper analysis of the hydrology in Cauvery delta zone and are not out of place

Important towns along the banks of Cauvery	Latitude and Longitude	Mean Sea Level (Meters)	Relative Humidity	Average Annual rainfall in mm (approx.)	Soil type
Talacaveri	12° 22 48 N, 75° 31 12 E	1,276	Higher during day, lower in the afternoon	889	Laterite
Srirangapatnam	12° 24 50.4 N, 76° 42 14.4 E	679	Higher during day, lower in the afternoon	855	Red clay
Hogenkkel	12°07'09 N 77°46'26 E	228.6	Higher during day, lower in the afternoon	778	Black cotton soils
Tiruchchirappalli	10°48'18 N 78°41'08 E	88	Higher	830	Black cotton soils and red soil
Thanjavur	10° 46 56.99 N, 79° 7 52.51 E	88	Higher	750	Red soil
Poompuhar	11° 8 38.4 N, 79° 51 18 E	1	Higher	1,283	Quagmiry Alluvial



Source: www.indianetzone.com

Map 1. The Cauvery River Basin and Flow of Cauvery across states

medial projections of the contrary resulting from people up and down the delta, the northern and the southern-whose overriding needs and extravagant use of water for purposes other than the life-supporting essential operations - condition the thinking and this thought averts the euphoria, the sense of water-well-being in the delta Cauvery zone.

Flowing through the above mentioned places Cauvery has got a conducive 'Flow Pattern' if one should put it in geomorphological terms.

Conclusion

From the argument hitherto, it is deducible that

- The Cauvery river delta's geoidal configuration is not easily variable and is fairly constant and consolidated due to the nature of Deccan Plateau region it is embedded in.
- Consequently, the hydrological cycle is enduring the sporadic deficit of monsoon or shot-falls due to changes in river water allocation.
- The increase of water needs in the delta zone is not so big a challenge as it seems when its negligibility can be rightly assessed in the face of an immense water table suctioning by virtue of sea-level differentia from the west.
- The climatological periodicity of monsoons will automatically, as though by nature's reflex would make good the felt deficit from time to time. As a result the innate hydrology is more often monsoon blessed timely or belatedly than not.
- Water repletion is quite possible in the soft terrain by anthropogenic efforts like rainwater harvesting and floral vegetation favoring these acts.
- Cauvery waterless and Cauvery water -rich are complementary synchronicities in surface-level water flow.

- When needs override and water use is extravagant delta may appear to be in for a drought -hit forecast. But the promise of innate hydrology proper to Cauvery delta must consolidate the pious attitude of the people to farming and agriculture due to the delta zone.

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