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JET STREAM THEORY

The dynamic theory of monsoon does not able to overcome some inherent limitations of Indian Climatology. The dynamic Theory does not able to clarify that why the arrival of monsoon does not takes place in the months of April and May inspite of the fact that Northward shift of sun starts after march similarly the theory also does not able to clarify the early and ^{late} onset and offset of monsoon, and the monsoon gap or intervals identified in the pattern of precipitation. To overcome all these limitations several expedition were conducted over the reaches or ranges of Himalaya and Tibetan Plateau, and also over basins like Indian Ocean, ~~Arabic~~ Arabian Sea and Bay of Bengal. Base on the outcomes propounded by P. Kotteshwaram in 1952, Indian Soviet monsoon experiment of 1973 (ISMEX) and Monex expedition of 1979 where 52 ships were deployed in several oceanic basins b/w

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10° North to Southern latitudes, the most pragmatic and accomplished theory of monsoon was propounded called as the Jet Stream Theory.

→ Jet Stream Theory during Winters

After September with the southward shift of sun when the Solar insolation remain ~~vertical~~ ^{vertical} in southern hemisphere, the shifting of pressure belts also take place ~~subsequently~~ ^{subsequently} towards south at this time 'inculcation (arrival)' of subtropical Jet stream also takes place in the physiographical region of Himalayas and Tibetan Plateau.

The orographic ~~obstacle~~ ^a of Himalayas able to trap the branches of subtropic Jet to the south of Himalayas as south tropical Jet Stream. Now this upper tropospheric cooler south tropical Jet established itself over subtropical India in the regions of Punjab, Haryana, Rajasthan, Western Uttar Pradesh and the whole Gangaic plain.

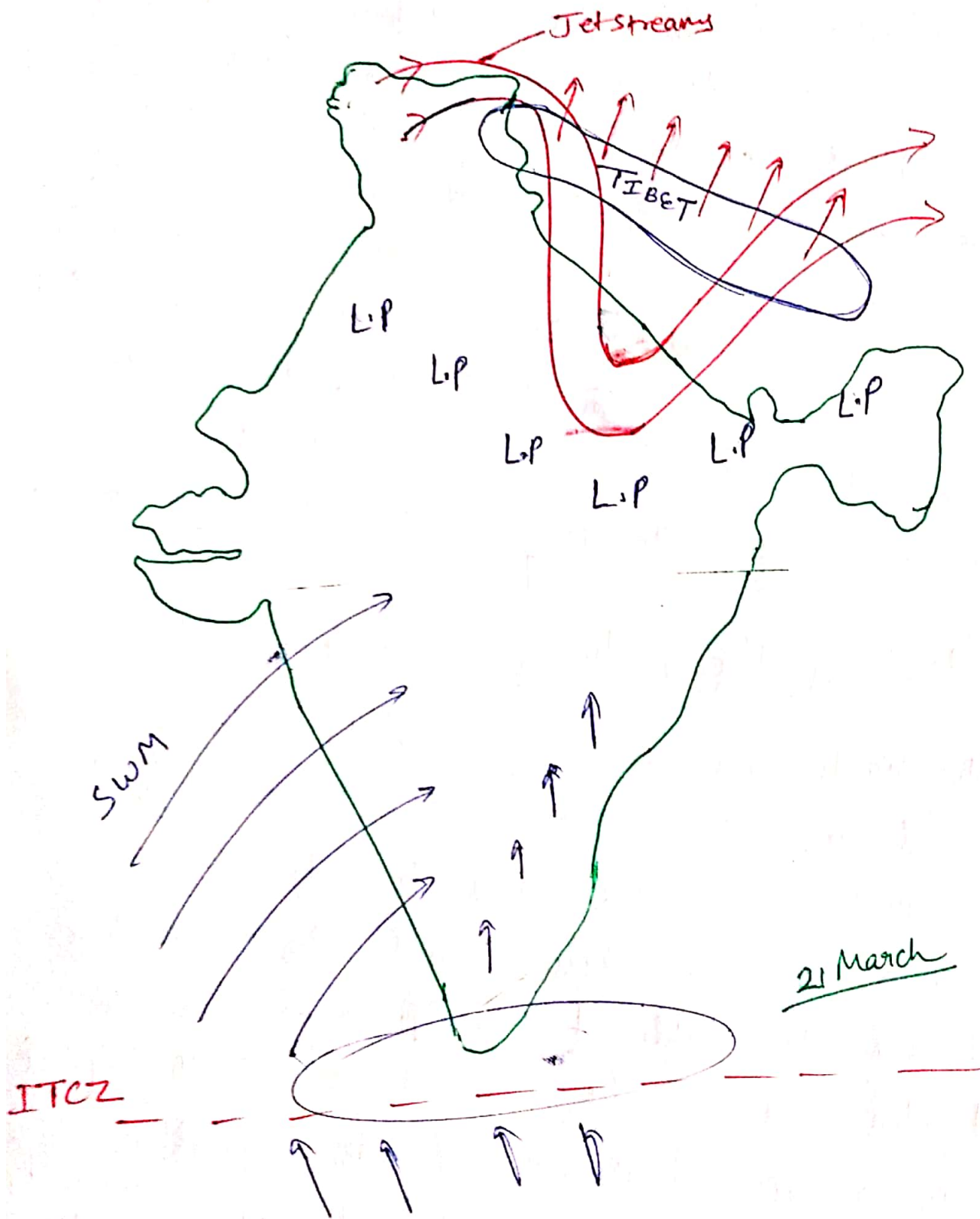
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The presence of south tropical Jet over sub-tropical India not only decreases the temp upto optimum level, but also create a strong high pressure condition over sub-tropical latitudes. In this change atmospheric ~~scenario~~ winds start propagating from sub-tropical India towards water bodies like ~~Arabian~~ ^{Arabian} sea, Bay of Bengal and Indian Ocean. These diverging air parcel get the designation of retreating and. North-east monsoon.

Jet stream Theory during Summer

After March when the solar insolation become vertical in northern hemisphere sequential shifting of ITCZ also takes places towards north, however this low pressure belt of ITCZ does not able to established itself over 25° Northern latitudes due to the presence of south tropical Jet. in upper troposphere (South tropical in upper). It means it create high pressure in surface. It means Untill the displacement of South tropical Jet takes place from India there would be no possibility of ITCZ advancing upto (L.P. area)

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Subtropical latitudes and monsoon winds approaching over Indian Subcontinent. It should be noted that the displacement of South tropical Jet advancement of ITCZ and subsequent arrival of monsoon takes place by very complicated phenomena in which the plateau of Tibet has an important role to play.

The Plateau of Tibet is located along the northern extremity of Indian sub-continent having a length of 2000 km in west-east direction and width of 500 km in North-south direction. The average elevation of this vegetation free relief feature is approximately 5 km from the surface and the surface of plateau also contain a particular category of igneous rock named AMPHIBOLITIC GRANITE having a tendency to absorb tremendous amount of solar insolation.

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After March when the insolation remains vertical in Northern hemisphere, the heating of Tibetan Plateau also takes place sequentially in the month of May - June. The surface of Tibetan plateau act as a heat sink zone to generate intense convection currents vertically. Convection currents originating from the surface able to uplift the whole band of Jetstream in upper troposphere as soon as the branch of south-tropical Jet able to uplift above to the heights of Himalayas, it automatically shift to the north of Himalayas. The shifting of south tropical Jet from India to the North of Himalaya provide an opportunity to the low pressure belt of ITCZ to extend towards north and establish itself over sub-tropical latitude. Now the presence of ITCZ over sub tropical latitudes create an intense low pressure condition over the surface to attract south-east ~~trade~~ ^{trade} winds from southern hemisphere. By the subsequent phenomena the south east trade wind to fill the low _{pressure} vacuum of ITCZ cross equator.

