Genetic Study of Indian Population

Prelims : Demographics

Mains: Salient features of Indian Society, Diversity of India

Why in News?

Old genetic study published recently continue to unveil the deep ancestral roots of Indian populations, offering insights into major human migrations and the historical impact on social structures like the caste system.

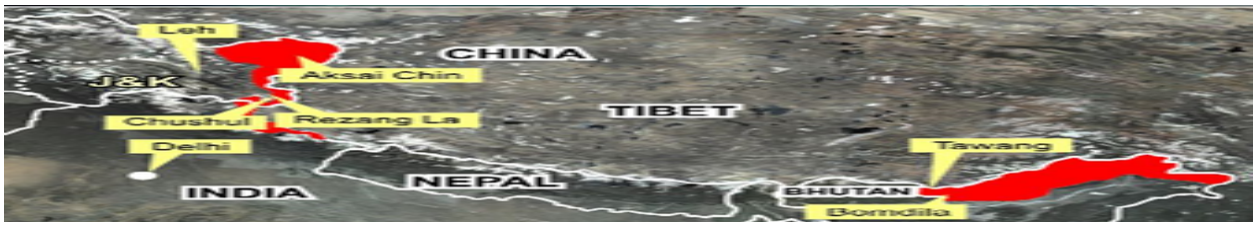
Published by – in 2009 by Harvard, MIT (US) & Centre for Cellular and Molecular Biology (CCNB)
Report Titled - 'Reconstructing Indian Population History',

Findings.

- **"Out of Africa" Migration** - 50,000 years ago, all present-day humans trace their lineage back to a single major migration out of Africa forming the foundational genetic component for populations worldwide, including India.
- **Major Ancestral Indian Populations** - 2009 study identified 2 primary, genetically divergent ancestral populations that contributed to most modern Indians:
    - **Ancestral North Indians (ANI)** - Genetically similar to populations from West Asia, Central Asia, and Europe.
    - **Higher ANI ancestry** -Predominant in northern Indian states. "Upper caste" groups across India show a significant proportion (39-71%) of ANI ancestry.
    - **Ancestral South Indians (ASI) -** Based on a deeper study of ancient genetic information from over 500 individuals in Central Asia and Northern South Asia.
    - It's been concluded that ASI are genetically distinct from the ANI, originating from East Eurasia, and that modern tribal groups in South India are considered their direct descendants.
    - **Admixture** - These ANI & ASI populations are believed to have largely mixed over 3,000-4,000 years ago, forming the complex genetic mosaic seen across India today as Dravidians & Aryans.
- **Ancient Ancestral South Indians (AASI)** - Older than the ASI.
    - Adivasi's of Andaman-Nicobar Islands are considered the "true ASIs" or AASI, having migrated from the East Asian-Pacific regions over 60,000 years ago.

- They largely remained socially and genetically isolated from mainland Indians.

- **Genetic Stratification** - Researchers in 2003 used 'haplogroups' (genetic markers of common parenting), indicates correlation with the caste system:
  - Certain ancestral genetic components are highest in tribal groups.
  - These components are somewhat less common in "lower castes."
  - They are least common in "upper castes."



- **Social barriers** – Are slowly eroding with increasing education, democracy & modernization.
  - **Inter-caste marriages** & **Inter-faith marriages** - Rose to 6% & 1% respectively by 2011 Census.
- **Future Outlook** - These numbers are expected to have risen significantly, in urban areas, reflecting increased social mobility and integration, with clearer data anticipated from the forthcoming 2027 Census.

Reference The Hindu| The peopling of the Indian subcontinent