EMPOWER IAS

GENERAL STUDIES - 1

TEST CODE -1018

1. "None of our developmental goals has any meaning without gender parity". Discuss.

2. Children are valuable assets for any country who need to be nurtured for the better future of the country. Discuss this statement with regard to child labour in India.

3 There is a marked improvement in the life of tribals in India.Reflect on the approach of tribal development in India. Suggest measures to improve various human development indicators of tribes.

4.Regional aspirations of people are a threat to our country. What are the binding forces present in our country checking this menace of regionalism. Enumerate.

***5*. Instead of focusing on smart city our priority should be on smart village to make the nation smart. Analyse the statement with suitable examples.**

6. India, in post independent era, has opted for a composite culture model of national unity rather than a uniform cultural model. Elaborate.

7. Women should be protected against the evil practice of dowry related violence and death but it should also be made sure that men are not victimised. Comment.

8. Villages and cities in India are part of the same civilization and as such cannot be separately understood. In the light of the given statement, discuss the impact of urbanisation on the basic social institutions in India.

9. The ramification of globalisation process can reflect directly in the social and cultural arena of human life. In this context, analyse the impact of globalisation in India.

10. Though the Secular traditions are very deep rooted in the history of India, communalism has started to threaten it. Do you agree?

11. Discuss the working of the Indian Tsunami Early Warning System (ITEWS). What are the limitations of Indian Tsunami working system that need to be changed?

12. The prevailing water crisis in the country is not due to the unavailability of water rather the mismanagement of water resources. Discuss the short term and long term socio-economic impacts of water crisis in India?

13. Climate has been a important determinant of agricultural productivity in India since agriculture in India is climate dependent. Discuss the role of applied climatology in agriculture development in India?

14. Discuss how soil degradation is related to climate change and bio-diversity loss. Briefly explain various agronomic methods of soil conservation?

15. Uneven distribution of water in Northern and Southern rivers in India is mainly due to geographic and climatic reasons. To what extent interlinking of rivers can effectively address these challenges. Bring out the various issues regarding the proposed interlinking of river projects?

16. Explain how jet streams help in formation of cyclones and polar vortex. Also discuss impact of polar vortex on global climate with the help of suitable examples?

17. Critically analyse the potential, status and growth of pharmaceutical sector in India. Discuss the reasons for geographical concentration of pharmaceutical industry in western India?

18. Rare earth minerals are very significant for every nation across the world. Bring out the distribution of Rare earth minerals worldwide. Discuss the potential of Rare earth industry in India?

19. Describe various types of weathering. Discuss how does it influence vegetation, landforms and soil?

20. Why coral reefs are called rain forests of the ocean? Bring out factors responsible for coral bleaching in oceans?

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Q1. "None of our developmental goals has any meaning without gender parity". Discuss.

Ans:- United Nations Declaration of Human Rights has set 2030 agenda for a new, fairer, more sustainable world, to achieve full equality of men and women. This goal of women empowerment is a pre-condition to eliminate poverty, inequality and violence against women and to achieve full role of women in society, economy, governance etc.

Gender inclusive development means to include and provide equal opportunity at par with men. SDG 5 also strives to achieve gender equality and empowerment of women and girls. Women represent nearly half of the world population (48.5% in India). India being one of the fastest growing economy, yet performs poorly when it comes to gender equality ranking 125/159 in gender inequality index. Girls start facing discrimination from birth which is evident from poor child sex ratio 919(2011). Female literacy rate is 65.46% out of total 74.04%.

Indicators of gender disparity

1. Lack of proper nutrition resulting into anaemia, stunting, school dropouts.

2. High maternal mortality, infant mortality, feminisation of sexually transmitted diseases.

3. Labour force participation rate is lower than males in urban and rural areas (22.5%).

4. Lower level of financial inclusion.

5. Hidden contribution of women in the form of unpaid work.

6. Lack of gender parity in promotion opportunities giving rise to glass ceiling effect resulting into gender pay gap (30%)

7. Sexual abuse at workplace, tafficking, unpaid work, domestic violence, dowry etc.

8. Poor representation in the national and premier organisations for example 61 women in Lok Sabha and less than 20% in scientific research centres.

Development and gender parity tradeoff

1. Social development

- Increased contribution of women in the household by improving access to resources lays the foundation of better health and education

- High life expectancy, low infant mortality and low maternal mortality.
- Increased literacy levels of women lowers the fertility rates thereby reducing population) , early pregnancy, spread of diseases like AIDs.

2. Economic development

- High labour force participation, increased contribution in economy
- Reducing poverty, improving per capita income
- National programmes likes START-UP INDIA, MAKE IN INDIA, DIGITAL INDIA etc will become more inclusive and result oriented
- Increased availability of human capital and better human resource development

3.Political development

- Giving power to women at local level can lead to better distribution of public goods, hence better rural development
- Women policy makers can make more gender based policies leading to holistic development.

Way forward

1. Gender budgeting to fully adopted and institutionalized.

2. Education system should inculcate values of gender equality at early age to curb patriarchal mindset.

3. Awareness campaigns like beti bachao beti padhao, women helpline, Ujjawala, Swadhar Greh, Mahila e-haat etc.

4. Effective implementation of dowry prohibition act, Special marriage Act, PNDT act, Sexual Violence (prohibition) at work place etc.

5. Date collection and analysis on various forms of violence against women.

6. Engagement of national and local level campaigns of government with civil society.

7. Training and recruiting women and providing them skill.

8. Increased representation of women in public spheres.

India can become a developed nation only when its women are truly empowered and this requires efforts from various stakeholders beginning from homes by providing them equal opportunities of education, health, nutrition and decision making.

Q 2. Children are valuable assets for any country who need to be nurtured for the better future of the country. Discuss this statement with regard to child labour in India.

Ans: Child labour means employment of children in any work that deprives children of their childhood and interferes with their ability to attend regular school .This impacts the mental , physical and social growth of a child .(5-14 years India)

India is preparing itself to reap the benefits of demographic dividend but child labour is a major impediment to it.10.1 million (13 % of workforce) children (5-14years) in India are engaged in manual work like cotton growing , matchbox , lock making , mining and stone quarrying , tea plantation etc.

Children are valuable assets for India hence they have to be nurtured:-

- Children are tomorrows youth which provide the human potential for country's development.
- As future citizens they will become useful member of society and contribute effectively in the building process of the nation.

Causes of child labour in India:-

1. Poverty and illiteracy of child parents .
2. Lack of awareness of harmful effects of child labour .
3. Lack of access to basic and meaningful quality in education and skills training.
4.No school in the areas of difficult terrain and tribal areas .
5 .High rates of adult under employment and unemployment .
6.Cultural values of family and surrounding society .
7. Out of school children and girls are more vulnerable to exploitation.

Impact of child labour:-

- Deprives children from education and learning skills, keep them away from secured job and hence inter generational cycle of poverty.
- Health- children are depressed deprived of physical development through the creation play and nutrition.
- Lack of decision making and powerlessness subject to neglect exploitation and abuse rise of child trafficking and drug abuse victim of armed conflict civil unrest.
- They have less life expectancy than average person.
- They become juvenile delinquents
- They no longer remain productive asset for the nation due to illness because their health conditions are not apt for working at later age.

Challenges in the implementation of laws:-

- Non uniformity in child labour and invisible character .
- Corruption in the strict implementation of laws and low conviction rates.
- Lack of awareness and education

Suggestions:-

- Combating child labour will require long term and coordinated actions by government and various stakeholders like mass media and NGOs.
- Education is the key to prevent child labour which includes expansion of access to schools , addressing violence in schools etc.
- Enhanced gender parity awareness , social protection schemes.
- Ratification of ILO conventions on child labour
- Law enforcement and use of technology and strengthening Child Protection system
- Curb sexual violence against children.

It is imperative to take steps for the welfare of children catering to the development needs at an early stage.

Q 3 There is a marked improvement in the life of tribals in India.Reflect on the approach of tribal development in India.Suggest measures to improve various human development indicators of tribes.

ANS: Planning is generally accepted in many developing countries as an indispensable means to promote development. In India, planning processes are being implemented for over six decades. Tribes encounter socio-economic, cultural and political problems. They are considered as a weaker section of the society. The tribal development planning is being

implemented along with five-year plans under the control of Government of India. But, Indian tribes are facing some unsolved problems.

Some measures to improve various human development indicator of tribes:-

1.Constitutional Safeguards must be further strengthened

Article 15(4) - Special provisions are made for educational advancement of the Scheduled Tribes. These provisions are like, reservation of seats and relaxation in marks in admission to educational institutions, scholarships, etc.

Article 46 - The State is enjoined upon to promote with special care to education and economic interests of ST and protect them from social injustice and all forms of exploitation.

Articles 330 and 332

Article 339(1)

The majority of the tribes depend on land and forest to make a living. Their social life is also interwoven around the land they live on. They have thus a physical and emotional attachment and dependence on land and forest. In this context, launch of Van Bandhu Kalyan Yojana, Single Window System for Obtaining Market Information on Minor Forest Produces, Setting up of 184 Eklavya Model Residential Schools, Preparation of Tribal Map of India and Launch of MFPNET Portal of TRIFED were some of the important Initiatives for Tribal welfare during the year 2014.

2. Governance deficit be bridged and social infrastructure like schools and hospitals be effectively administered.

3.FRA and PESA be implemented effectively.

4. Most of the tribal areas are violence prone due prevalence of LWE hence, confidence building measures to win back their hearts and minds.

5. Extra judicial killings must be dealt effectively.

6. Prevalence of Malnourishment needs to countered through swift implementation of PDS system by fixing leakages and containing corruption.

7. Employment opportunities needs to be created by imparting skills to tribal youths.

8. Promotion of tribal artefacts by making backward and forward marketing linkages etc.

9. A Single Window System for obtaining information on Minor Forest Produces (MFPS) where market rates information can be provided over phone to tribals.

10. Tribal Map of India must utilize the technology of Geographical Information System (GIS) which will help the government while implementing different programmes and introducing new schemes and projects for tribal people.

Q 4.Regional aspirations of people are a threat to our country. What are the binding forces present in our country checking this menace of regionalism. Enumerate.

Ans: Regional aspirations of People. First Mention its historical perspective i.e. India based on two nation theory, Formation of Country witnessed riots, Then the Kashmir issue.

States formation is having linguistic base.

Initially there was no regional aspiration as such among masses but Leaders/Neta fuelled it for their narrow personal gains. Creation of States like Jharkhand, Telangana as well as demand for Purvanchal, Vidarbha has more to do with Politics. Mentioning of North East alieanation as well as nefarious designs of MNS(North Indian beatings etc) and Bangladeshi Problem in Assam, Bengal and India as a whole.

Remedy:

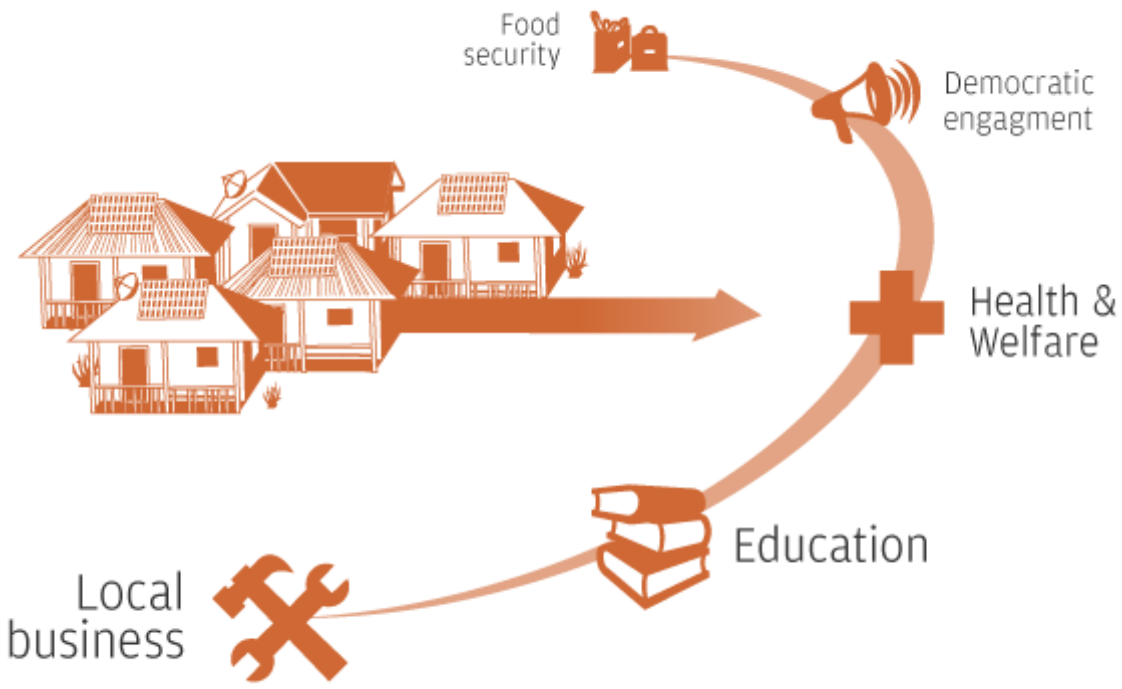
- Negative and Positive - negatively through curbs and positively through Promotion of National Integration.
- Common link language with all countrymen to be exhorted to learn other languages.
- All states should be treated equally (no special status unnecessarily)
- Patriotism for nation should be developed from school
- State political parties or organisations that promotes regionalism should be warned of being banned culture & heritage of all states should be encouraged equally
- Centre State relations should be more decentralized so that states will no longer blame center for their developmental issues but neutral Central oversight.
- To remove regionalism we have first reduce the social divides.
- There should not be any special statuses to any State (J&K or NE States).
- Uniform law. No family Laws. No specific laws for the states etc.
- GST could be dubbed as one such move. Lastly we have to espouse for the 'INDIA FIRST'.

Q 5.Instead of focusing on smart city our priority should be on smart village to make the nation smart. Analyse the statement with suitable examples.

ANS:- A champion of participatory democracy and grassroots development, that makes villages self-contained and sustainable was the first step towards empowering India. It was nothing but in this way, Mahatma Gandhi conceptualized smart villages.

What is smart village:

In Smart Villages access to sustainable energy services acts as a catalyst for development – enabling the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes, and enhanced security, gender equality and democratic engagement.

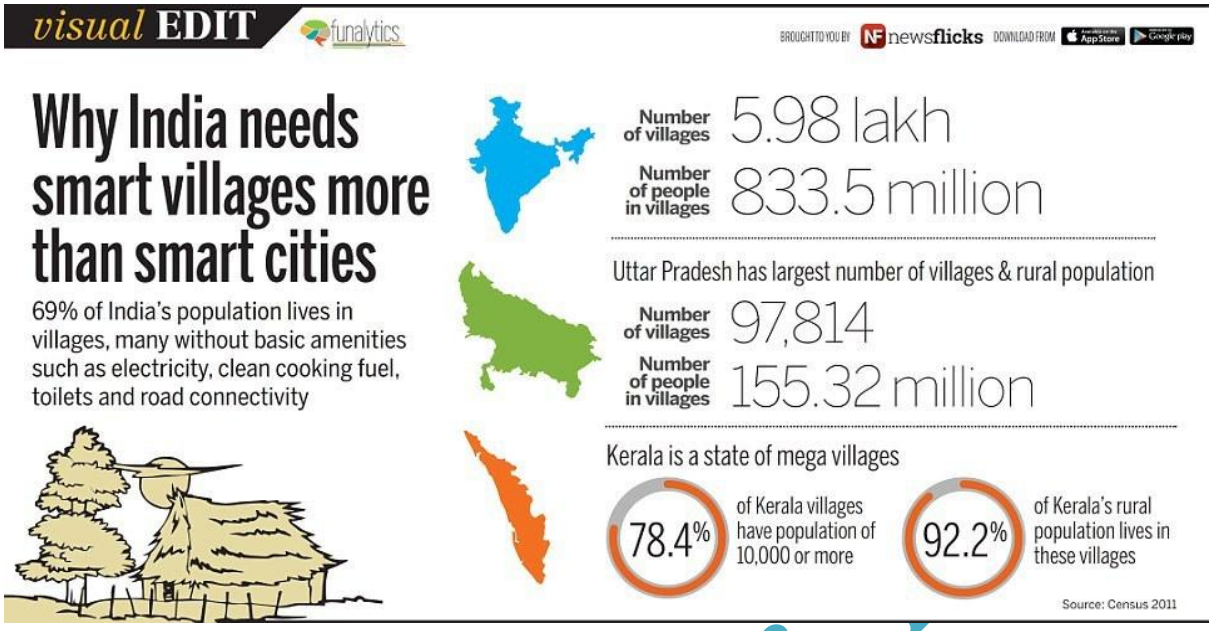


Why concentrate on villages?

•Almost 70% of the Indian population lives in villages. In recent times, more cases of farmers' suicides due to crop failure have been reported. Even after 70 years of independence, we lack a 'support and guidance system'; nor do we have professional counselling for farmers. Many of them have no secondary source of income — this is a major lacuna.

•The lack of job opportunities in villages coupled with less remunerative farming (except in the case of large land holdings) compels village youth to migrate to cities. There, many of them do not enjoy a reasonable quality of life because they manage to get only subsistence jobs. •The migration is also unidirectional as they continue to live in cities in the hope of landing better jobs. In the long term, this leads to desertion from villages, dilution of village culture, reduced land under cultivation and, consequently, farm output.

•In the cities, uncontrolled migration adds to pollution, traffic problems, crime, and over-burdening of civic amenities and infrastructure. Therefore it is natural that for 'inclusive' development, the Government must focus on them.



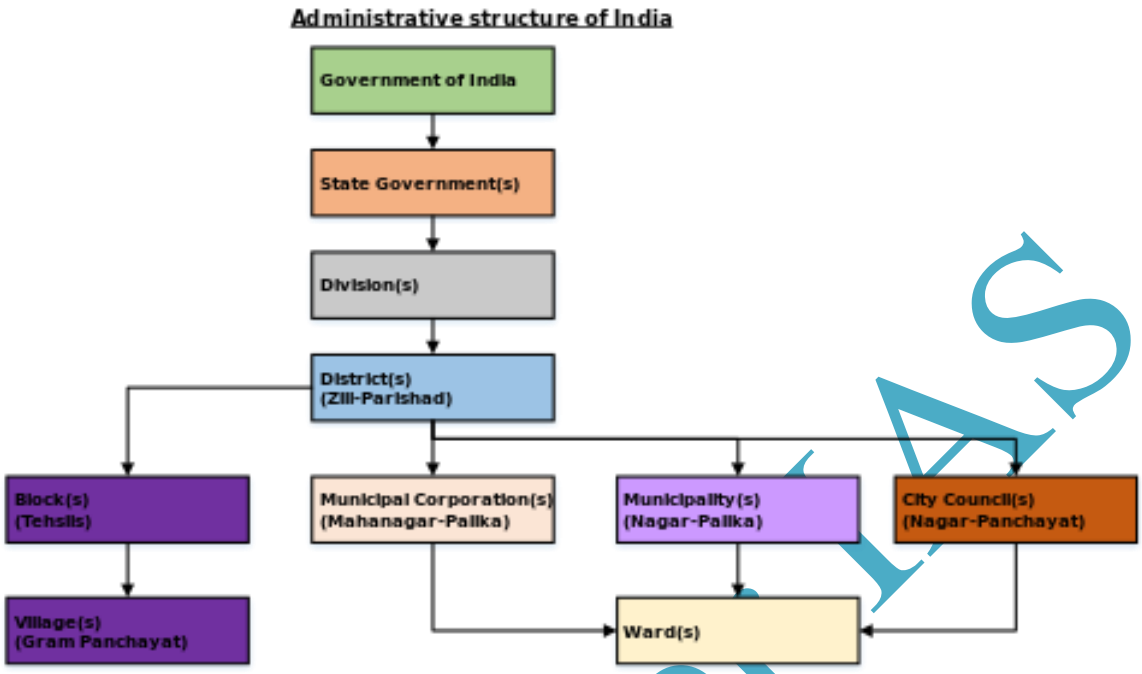
Present scenario:

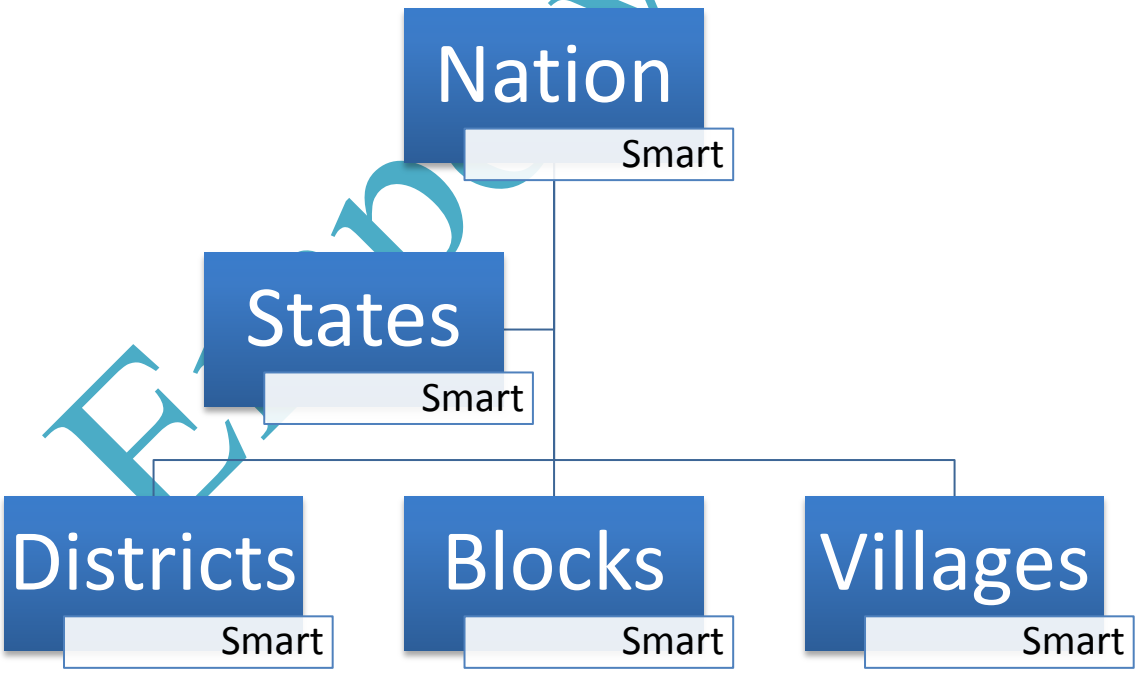
- According to the most recent socioeconomic and caste census data, a third of India's rural households are landless and dependent on manual labour for an income.
- About 13% of rural households are still only one-room tenements built with mud walls and fragile roofs.
- There is not even basic health insurance in case of serious illnesses. Rural health centres are not easily reachable, and even if they are, they don't have either the facilities or the medicines to treat anything other than diarrhoea and bacterial infections.
- Malnutrition is widespread and one of India's most enduring enigmas.
- Roads in the interiors are also not in good condition. They are difficult even to walk, not to speak of travelling by carts, and have been in that condition for years.

What needs to be done?

- The top priority should be the creation of opportunities for youths in villages, thereby discouraging migration to cities. We must create an eco-system that makes youth interested in working from their villages. BPOs/KPOs can operate from villages and young people can be encouraged to take up IT jobs there. Many jobs require computer skills instead of degrees. The digitisation of post offices, rural banks, and IT-enabled services provide excellent opportunities.

- Farming should be made a remunerative occupation, with guidance and mentoring to small farmers on how to get the best yield and market at remunerative prices. It's important to train them to develop a secondary source of income.
- The benefits of schemes such as crop insurance, soil health card, and neem pesticides must reach the grassroots. Proper implementation is key. A helpdesk set up in every village and manned by trained individuals to handle farmers' queries and provide solutions would be most useful.
- Projects supported by Digital India and Skill India should be integrated through a unified agency to reach villages. For instance, Skill India can empower youths to start their own small businesses after training as masons, mechanics, electricians, and drivers or to run repair shops, poultry and dairy farms, kirana stores, tea-shops, dhabas and so on.
- India's crafts thrive in villages, especially as cooperative ventures. Pottery, metal craft, weaving, jewellery making, wood craft, shell craft, cane craft, embroidery, ivory craft, glass craft and paper craft could be sources of income. The arts and crafts ecosystem of villages is impossible to recreate in cities. A great deal of export potential is hidden here. Senior/elderly artisans can be employed as 'trainers'.
- Villages traditionally preserve large number of water bodies like ponds, wells, bawadis, canals etc. Training villagers in water harvesting methods, rejuvenating ponds/wells to improve water storage and sharing these good practices systematically with others, would help mitigate hardships





How to make smart (summary):

1.Infrastructure

2.Hospital
3.Education
4.Create sense of security
5.Provide security to female by all means
6.By removing inequality by all means (economic, social, political) in real sense
7.Creating job opportunity.

All things are possible only when :
If we need to put the 'fun' back in farming we need to create a new excitement and sustained returns that makes people desire to live in villages, not just going there on weekend trips or seeing it as a museum. We need money to draw people, not just for sentimental values and feeling good. We need to mix and match across successful ventures to weave the solution, learn and adapt as we grow. And replicate and scale across.
Most of the 'unsolvable' problems in today's metro cities (traffic, garbage and sanitation) stem from a single root cause – the massive inflow of people, which chokes the cities.
The big metros are nothing short of big slums. So, there is need to prevent migration from villages to cities.
There are so many inspiring visions and models of smart villages across the country. "We don't need to create anything new, we just need to pay attention to 'creative restoration'.
For example, 'smart village' comes from Auroville in Puducherry and similar community The IT revolution that put India on the world map caused more damage to the cities through the emergence of huge IT tech parks, rapid unplanned development, unreasonable salary differences, and the quest for an 'easy lifestyle'.

Q 6.India, in post independent era, has opted for a composite culture model of national unity rather than a uniform cultural model. Elaborate.
Approach:
- Introduce composite culture and uniform culture model
- Connect it to the policies or approaches adopted post independence
- Emphasize on the model adopted as more suitable to the unity of India

Ans: Uniformity presupposes similarity, unity does not. Unity means integration. It is a social psychological condition. It connotes a sense of one-ness, a sense of we-ness. Thus, unity may or may not be based on uniformity. Uniform cultural model of integration has to be based on similarities like found in traditional and tribal societies. Composite culture model

is to be a blend of many different cultures to integrate them all. We find in India diversity of various sorts. Some of its important forms are: racial, linguistic, religious and caste-based. Despite such diversity, many factors bind India together as a nation:
a) geo-political, b) pilgrimage, c) coexistence of different faiths, and d) institution of jajmani. The first bond of unity of India is found in its geo-political integration. India is known for its geographical unity marked by the Himalayas in the north end and the oceans on the other sides. Politically India is now a sovereign state. The same constitution and same parliament govern every part of it. We share the same political culture marked by the norms of democracy, secularism and socialism.
As well as being an expression of religious sentiment, pilgrimage is also an expression of love for the motherland, a sort of mode of worship of the country. It has played a significant part in promoting interaction and cultural affinity among the people living in different parts of India. Pilgrimage can, therefore, rightly be viewed as a mechanism of geo-cultural unity. Mechanisms of coexistence of people of different faiths have been in existence here for long. Take for example, the case of Hindu-Muslim amity. Hindus and Muslims have always taken part in each other's functions, festivities and feasts. both Hindus and Muslims have shown reverence to the saints and Pirs of each other. And this holds as well for the coexistence of other religious groups like Sikh, Jain, Christian and so on The institution of jajmani provides for inter linkages between people of different different castes across religious groups.The composite culture model provides for the preservation and growth of plurality of cultures within the framework of an integrated nation. Hence the significance of our choice of the norm of secularism, implying equal regard for all religions, as our policy of national integration.Efforts have been made from time to time by sensitive and sensible leaders of both the communities to synthesise Hindu and Muslim traditions so as to bring the two major communities closer to each other. Akbar, for example, founded a new religion, Din-e- Ilahi, combining best of both the religions. The contributions made by Kabir, Eknath, Guru Nanak, and more recently Mahatma Gandhi, are well known in this regard. Similarly, in the field of art and architecture we find such a happy blending of Hindu and Muslim styles. What else is this if not a proof of mutual appreciation for each other's culture? Quite in line with these traditional bonds of unity, the Indian state in post Independence era has rightly opted for a composite culture model of national unity rather than a uniform culture model.

Q 7 Women should be protected against the evil practice of dowry related violence and death but it should also be made sure that men are not victimised. Comment.
Ans. Approach
•What are implications of dowry

- Mention legal provisions to protect women
- Also, discuss the misuse of the provisions

Give your views on the issue

Ans: The persistent demands for dowry lead to the oppressive conduct and cruelty of the in-laws towards the bride, resulting in her death. The practice of dowry has engaged as a major social evil in contemporary India, the disconnecting aspect of the problem is that higher education and economic stability of young man, instead of serving to reduce the problem, aggravated it.

A custom consistently followed, increasingly glamour and occasionally rationalized cannot be wished away by criminal sanctions and legislations. However, stringent Act and sections of IPC are there to deter dowry related violence.

As there is increase in number of marriages every day, at the same time breakdown of marriages in the society has also been seen to be increasing whether by fault of husband or wife. Though cases filed by wife against husband and in-laws under Protection from Domestic Violence Act and 498-A of Indian Penal Code to claim maintenance and divorce but all complaints filed are not bona-fide

The Government of India passed the Dowry Prohibition Act, 1961 made the giver as well as the receiver of the dowry punishable, but this is another piece of social legislation which is absolutely ineffective. One sees hardly any change in the situation as a consequence of this Act. Crimes such as bride-burning and abetment of suicide come within the purview of Sections 302, 304-B, 306 and 498-A, IPC.

The Criminal law Amendment Act, 1983 inserted section 498A (Chapter XX-A) relating to cruelty by husband or relatives of husbands to combat social evil of dowry and matrimonial atrocities against married women. There are several provisions in penal law relating to offences of matrimonial nature. A married woman is subjected to cruelty under Indian Penal Code, 1860 by her husband or his relatives (498A) or by same husband and his relatives in demands of dowry preceding unnatural death within seven years of marriage (304B) or causing woman's death (302) amounting to murder. In both sections 498A and 304B cruelty extends toward death. A person charged under section 304B can be convicted under 498A without any charge under that section.

But this shield has become only and multipurpose sword against husband and his relatives. According to Malimath Committee Report once a complaint or FIR is lodged under section 498A or 406 of Indian Penal Code, it becomes easy tool in the hands of the police to arrest or threaten to arrest the husband and other relatives named in FIR without even considering the intrinsic worth of allegations and making a preliminary investigation.

According to the data of National Crime Record Bureau, the conviction rate in dowry related cases has come down over the years or the acquittal rate has gone up. The conviction rate of Section 498A is among the lowest among all the IPC crimes. Hence, it is clear that the shield of law is being misused to harass in-laws. As men are being victimised, the court and government looked into the matter.
Recent judgement of the Supreme Court stated that the police can no longer make immediate arrests in cases filed under 498A of IPC. The charges would first be verified by a Family Welfare Committee to be constituted at district level.
Thus, utmost effort should be made to protect women through stringent legislations to curb dowry related violence. However a balance should be stricken in a way that the law should not be used as a tool to victimize men.

Q 8.Villages and cities in India are part of the same civilization and as such cannot be separately understood. In the light of the given statement, discuss the impact of urbanisation on the basic social institutions in India.

Ans. Approach
- Outline the rural-urban continuum along with describing the process of urbanisation in India
- While discussing the impact on family, marriage and kinship, keep in mind that urban is not alienated completely from rural.

Urbanization and Rural-Urban Continuum
Urbanization is a structural process of change which is associated with the movement or migration of people from rural to urban areas. It is generally related to industrialization but it is not always the result of industrialization. It results due to the concentration of largescale and small-scale industrial and commercial, financial and administrative set up in the cities , technological development in transport and communication, cultural and recreational activities.
Urbanization implies a cultural and social psychological process whereby people acquire material and non-material culture, including behavioural patterns, forms of organization, and ideas that originated in, or are distinctive of the city. Although the flow of cultural influences is in both directions, i.e. from rural to urban and urban to rural, but there is no doubt that the cultural influences created by the city on non urban people are probably more pervasive than the influences exerted by the rural. The India of urbanization may be better understood when interpreted as aspects of diffusion and acculturation.
Impact of Urbanisation on basic social institutions:

Due to modern education full of western thoughts and ideas, emancipation of women and the association of young men and women with various political and social organizations, new ideas which are incompatible with the traditional norms and values are nurtured amongst the youth in cities. As a result their attitudes towards traditional norms changes and new values develop which affects marriage, kinship and family.

Marriage: There has been increase in factors like, age at marriage, wider circle of spouse selection within the caste, level of education of bride and so on. But what stands out clearly is the continuing link it has with caste. The change of attitude towards inter-caste marriages is reflected in opinion rather than in actual practice. Caste considerations are still playing a major role in marriage in reality.

Family: There is a structural congruity between the joint family on the one hand and the requirements of industrial and urban life on the other. A modified version of traditional joint

family is consistent with the urban industrial setting. In the process of social disorganization, the changes in family organization tend to take the form of changes from the large or joint family system to the small family system. Larger proportions of joint as well as quasi-joint families are found in the more traditional communities (existing outside the urban framework); and smaller proportions of such types of families are found in such communities as have been more exposed to outside influence. Even though the concept of joint family system have not disappeared altogether to give way for nuclear and fragmented family in urban India, the institution of family undergone a structural change under certain circumstances. In order to meet the demands of complex modern urban life a modified extended family is emerging and it consist of a series of nuclear families joined together on an equalitarian basis for mutual aid and functioning to felicitate the mobility strivings of its component member families and individuals

Kinship: The presumed dichotomy between 'rural' and 'urban' does not obtain in the Indian situation, at least when we examine such social institutions as family and kinship in urban India. In terms of change in the patterns of kinship in urban India, a strange anomaly between continuity and change is observed. However, increase in neolocal residences, change in the outward forms or observable patterns of kinship, may be change in degree and not in kind.

Kin group and sub-caste as the realms of primary interactions of the Indian urbanite are found if sub-caste had their parental or natal kin (parents, brothers, their wives, sisters, their husbands) living in the same city. The urbanites are found to interact most frequently with their natal kin in such setting.

The link between the types of society and jointness or nuclearity of the family and the household between urban and rural areas cannot be ruled out.

Q 9.The ramification of globalisation process can reflect directly in the social and cultural arena of human life. In this context, analyse the impact of globalisation in India.

Ans:- In very simple terms globalization can be depicted as increasing global interconnectedness. It is a process rather than an outcome, which refers to the trend toward the growing Interconnectedness of different parts of the world. It primarily is an interchange of economic, social, cultural, political, technological attributes that takes place between societies when different societies come into contact with each other.
The current process of globalisation also resulted in the globalisation of national policies and policy-making mechanisms of national governments. National policies including in economic, social, cultural and technological areas, which were till now under the jurisdiction of states and people within a country, have increasingly come under the influence of international agencies and the big private corporations.

The social impact of globalization:

a) Withdrawal of National Government from Social Sector
The share of health expenditure had been stagnant and that of education had been declining. The government is further trying to reduce the size of current expenditure by reducing expenditure on pensions, subsidies etc.
b) Labour Reforms and Deteriorating Labour Welfare
The current pace of globalization also results in casualisation or informalisation of the work force causing low wages for labourers and less job security, although it created employment opportunities to some of the work force. The growth of the informal sector means that the traditional employment related benefits and mechanisms of protection are not available to those employed in this sector.
c) Feminisation of Labour
d) Poverty
e) Unsustainable Development Practices
In India, for example, the replacement of native seeds by imported hybrid seeds or cash crops resulted in more and more exploitation of ground water through tube-wells since these crops need more water. The over exploitation of the groundwater in turn resulted in the depletion of ground water level leading to famines and poverty. The high yielding hybrid seeds are vulnerable to pest attacks resulting in more use of pesticides. The indiscriminate use of chemical-based fertilizers, especially subsidised fertilizer, has created an imbalance between the essential mineral contents such as Nitrogen and Pottasium. There is a growing realisation of the degradation of land, water and environment due to the current pattern of agricultural production and its sustainability

among the people
f) Migration and Urbanisation
g) Commercialisation of Indigenous Knowledge
h) Rising Inequality in Wealth Concentration
The cultural impact of globalisation:
a) Increased Pace of Cultural Penetration
b) The Globalisation of Culture
c) Development of Hybrid Culture
d) Resurgence of Cultural Nationalism
Hence, we can say that globalisation have an impact on the everyday life of social beings. Also, multifarious cultures interacting at an ever increasing speed and various cultures are farming under testing conditions. Side by side, there is a resurgence of cultural nationalism.

Q 10.Though the Secular traditions are very deep rooted in the history of India, communalism has started to threaten it. Do you agree?

Ans:- Secular traditions are very deep rooted in the history of India. Indian culture is a composite one which is based on the blending of various spiritual traditions and social movements. In ancient India, the Sanatana Dharma (Hinduism) was basically allowed to develop as a holistic religion by welcoming different spiritual traditions and trying to integrate them into a common mainstream. The development of four Vedas and the various interpretations of the Upanishads and the Puranas clearly highlight the religious plurality of Hinduism. In his 12th Rock Edit, Ashoka made an appeal not only for the toleration of all religion sects but also to develop a spirit of great respect toward them. He pleaded for restrain of criticism of other religious sects.
In medieval India the Sufi and Bhakti movements bond the people of various communities together with love and peace. The leading lights of these movements were Khwaja Moinuddin Chisti, Baba Farid, Sant Kabir Das, Guru Nanak Dev, Saint Tukaram and Mira Bai. They contributed to the development of a composite culture in such a manner that nobody dares to challenge them. The remarks of Guru Nanak, when he says that 'There is no Hindu and no Musalman, as there is no distinction between man and man' give support to the roots of secularism.
The spirit of secularism was strengthened and enriched through the Indian freedom movement too. In the initial part of the Indian freedom movement, the liberals like Sir Feroz Shah Mehta, Govind Ranade, Gopal Krishn Gokhale by and large pursued a secular approach to politics. The Brahma Samaj started by Sri Raja Ram Mohan Roy and the Arya Samaj led by Swami Dayanand Sarswati never treated other religious faiths with any antipathy. On the other hand, they tried to purify the wrong traditions which had gradually sapped the vitality of Hindu religion

At present scenario, in the context of Indian, the separation of religion from the state constitutes the core of the philosophy of secularism. The expression 'secular' has also a special significance in the context of the historical development of Indian polity. It is of pivotal importance in the context of political realities on the ground as they exist now. In India, the word secular is identified with tolerance among the different religions. In a secular state, no one enjoys any special privilege in national life or in any type of conduct for international relations. No group of citizens arrogates to itself the rights and privileges which it denies to others. No person suffers from any form of disability or discrimination because of his religion but all alike to be free to share the fullest degree of freedom in his the common life.

11. Discuss the working of the Indian Tsunami Early Warning System (ITEWS). What are the limitations of Indian Tsunami working system that need to be changed?

Ans: After the Tsunami episode in 2004, India started its Interim Tsunami Warning Centre in 2005 to issue tsunami bulletins generated from seismic information. At present, India has developed the state-of- art ITEWS at the INCOIS (Indian Centre for Ocean Information Services), Hyderabad, under the Earth System Sciences Organisation (ESSO).

ITEWS has 2 components –

1. A network of sensors to detect tsunamis and

2. A communication infrastructure to disseminate timely alarms.

The modelling studies have shown that Tsunamigenic EQs occurring close to Andaman and Nicobar Islands have the water arrival time less than 30 minutes for A and N Islands and for the mainland it is more than 4 hours. Therefore the criteria to be adopted for the issue of warning need to be different for the islands and for the mainland. In case of A and N Islands, there is a need for immediate warnings without enough time for confirmation of water levels and that might lead to False Alarms. ITEWS comprises a real time network of seismic stations, Bottom Pressure Recorders (BPRs), Tide Gauges and 24X7 operational warning centres.

Tsunamigenic zones that threaten the Indian Coast are

1. Andaman-Nicobar- Sumatra Island Arc

2. Makran subduction zone, north of the Arabian Sea.

ITEWS detects all EQs of more than 6 magnitude occurring in the Indian Ocean in less than 20 minutes of occurrence. Seismic and sea-level data are continuously monitored in the ITEWS using a custom-built software application that generates alarms/alerts whenever a pre-set threshold is crossed. The warning system is capable of issuing tsunami bulletins in less than 10 minutes after any major earthquake in Indian Ocean.

The present system is suited for the mainland forecasting where travel time is 3 to 4 hours from the epicentre. It needs to be improved for the Andaman and Nicobar Islands where the travel time is less than 30 minutes. The decision support system at the Warning Centre is based on pre-run scenario data base of pre-defined magnitudes. Next generation decision support with real time inputs from BPRs will substantially improve the forecast.

12. The prevailing water crisis in the country is not due to the unavailability of water rather the mismanagement of water resources. Discuss the short term and long term socio-economic impacts of water crisis in India?

Ans: India accounts for 4 percent of world's water resources and about 16% of population. Total water available from precipitation annually is about 4000 cubic while surface water and replenishable groundwater is 1869 cubic km. However, due to high population per capita availability is still low. Added to this, due to mismanagement India is facing a severe water crisis:

- Agriculture: As a free resource ground water is over exploited leading to decrease in waters table, over utilization of subsidized fertilizers led to seeping of impurities into water bodies, growing of water intense crops in water starved regions led to water shortage.
- Pollution: India has failed to strictly regulate industries leading to industrial waste flowing into water bodies and seriously contaminating rivers, lakes etc.
- Subsidized or free water provided by the government has led to overuse and misuse by people.
- Water harvesting: While India receives major water through monsoon concentrated in summers, practice of water harvesting is very limited.

Short term socio-economic impact of water crisis:

- It can become leading cause of food inflation which will affect the poor

- It can lead to crop failures, lower agricultural output which can lead to farmer's indebtedness, distress sale and suicides in Maharashtra and Andhra Pradesh
- Mushrooming of water mafia and corruption, which will put economic pressure on people at bottom of development ladder.

Long term socio-economic impact of water crisis:

- It leads to serious food security problems as agriculture, animal husbandry and aquaculture will be affected
- Polluted water can lead to water borne diseases, which puts financial pressure on the poor
- People will be forced to migrate from the water scarce areas to water intense areas
- Water crisis will further intensify the class based social cleavage as only haves can pay for the luxury of water
- Water crisis will sharpen regional disparities intensifying regionalism
- Water intense industries will be impacted leading to unemployment and lower growth rate
- Water crisis will lead to loss of biodiversity and communities or employment based on that will be affected
- Social harmony will be impacted which will threaten the democracy itself

Hence, it is imperative that the management of water is prioritized by the government, NGOs and people. Water harvesting, watershed management, judicious use of ground water, reducing pollution of water resources is the need of the time. Awareness about schemes like Namami Gange, PMKSY must be heightened and such conservation schemes be strictly implemented to prevent the augmentation of the ongoing crisis further.

13. Climate has been a important determinant of agricultural productivity in India since agriculture in India is climate dependent. Discuss the role of applied climatology in agriculture development in India?

Ans: Applied Climatology is the scientific analysis of climatic data in the light of a useful application for an operational purpose. "Operational" is interpreted as any specialized endeavour within such as industrial, manufacturing, agricultural, or technological pursuits. Applied climatology has been the foundation upon which the world's weather-sensitive activities and infrastructure have been developed. Applications of climate data and information have likely contributed more to the development of most nations than any other function of the atmospheric sciences Importance of climate in Agricultural productivity:

i. Rainfall: Changes in climate may also impact the water availability and water needs for agriculture. Rainfall in India has a direct relationship with the monsoons which originate from the Indian and

Arabian Seas. A warmer climate will accelerate the hydrologic cycle, altering rainfall, magnitude and timing of run-off.

ii. Temperature Increase: Many scientists project that the average temperature will rise in the next few decades. If temperatures increase, cooler areas of the country might be more habitable for some of the main food crops. In areas where crops are being grown in their warmest productive temperature ranges already, heat stress or increased disease could reduce yields.

iii. Extreme weather events: Extreme weather events include heat waves, droughts, strong winds, and heavy rains. All of these events can be detrimental to crop growth.

iv. Carbon dioxide increase: Carbon dioxide is critical to photosynthesis (and thus plant growth). It is likely that higher levels of carbon dioxide will result in higher harvestable crop yields. However, this depends critically on the availability of sufficient water and nutrients necessary for plant growth.

v. Weeds, pests and diseases: Weeds have become more prolific and are expected to invade new habitats as global warming increases. Insect pests, some of which carry plant diseases, could become more prolific and widespread as temperatures increase.

Role of applied climatology in agricultural development:

- It will produce the data needed to make definitive studies of how various climatic conditions affected each crop.
- The models of the hydrologic system will measures evapo transpiration and soil moisture and their effects on both plants and crops.
- The study of climate will further help in selections of regionally appropriate crop varieties, and wise management of water resource systems in the varying climatic zones of the nation.
- Sophisticated climate–crop yield models will predict accurate yield outcomes well before harvest.
- Heavy-rainfall design information, critical to planning and designs to manage flooding will be highly useful in preparation of national drought index.

- The past 20 years have seen major advances in climate-prediction quality, partly related to a greater understanding of the climate system, such as the effects of El Niño on the nation's climate.

The effect of climate change poses many threats from changes in the quality and quantity water resources to crop productivity. So, there is an urgent need for coordinated efforts to strengthen the research to assess the impact of climate change on agriculture, forests, animal husbandry, aquatic life and other living beings.

14. Discuss how soil degradation is related to climate change and bio-diversity loss. Briefly explain various agronomic methods of soil conservation?

Ans: Soil degradation is the decline in soil condition caused by its improper use or poor management, usually for agricultural, industrial or urban purposes. It can be the loss of organic matter, decline in soil fertility, and structural condition, erosion, adverse changes in salinity, acidity or alkalinity, and the effects of toxic chemicals, pollutants or excessive flooding.

Relation of soil degradation with climate change and biodiversity loss-

Soil degradation and climate change:

The effects of demographic pressure and unsustainable land management practices on land degradation and desertification are being exacerbated worldwide due to the effects of climate change, which include changing rainfall patterns, increased frequency and intensity of drought and floods, rising temperatures, and profound ecological shifts.

Organic matter of soil is sensitive to changes in the climate and their decomposition rate increases with increased temperature. Similarly, Substantial increase in rainfall increases leaching and cause acidification of soil. Change in temperature and precipitation could affect soil nutrient levels in numerous manners.

Soil degradation and biodiversity loss:Land degradation or Desertification and the associated loss of vegetation, causes biodiversity loss and contributes to climate change through reducing carbon sequestration. Loss of forests would force fauna to leave that habitat as they will not be able to survive due to lake food security and shelter. So soil degradation is directly lnked to biodiversity loss. The effects of soil erosion go beyond the loss of fertile land. It has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species.

Agronomic methods of soil conservation:

i. Tillage: This umbrella term can include reduced tillage, minimum tillage, no-till, direct drill, mulch tillage, stubble-mulch farming, trash farming, strip tillage, plough-plant.

ii. Conservation Farming: It includes any farming practice which improves yield, or reliability, or decreases the inputs of labour or fertilizer, or anything else leading towards improved land husbandry like strip cropping, crop rotations, alternate cropping.

iii. Contour Farming: It is growing crops "on the level" across or perpendicular to a slope rather than up and down the slope. The rows running across the slope are designed to be as level as possible to facilitate tillage and planting operations on the contour.

iv. Mulching: Surface mulches are used to prevent soil from blowing and being washed away, to reduce evaporation, to increase infiltration, to keep down, to improve soil structure and eventually to increase crop yields.

v. Strip cropping: Strip cropping is the system of growing alternate strips of erosion permitting crops (row crop such as maize, jowar, bajra, cotton etc.) and erosion resisting crops (close growing crops such as green gram, black gram, moth, groundnut etc.) in the same field.

vi. Mixed cropping: It is the growing of 2 or more crops simultaneously in the same field without any definite row pattern. This is done by mixing their seeds. As soil conservation is one of the important component to protect biodiversity, Sustainability development goal number 15 says that Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

15. Uneven distribution of water in Northern and Southern rivers in India is mainly due to geographic and climatic reasons. To what extent interlinking of rivers can effectively address these challenges. Bring out the various issues regarding the proposed interlinking of river projects?

Ans: United Nations stated that water is a social and cultural good, not merely an economic commodity. Out of all the water available on the Earth, 97 % of water is saline and is in oceans, 3% of water is freshwater available in rivers, streams and glaciers. There is enough freshwater

available on the planet for current population of the world but it is distributed unevenly. Recently Indian government launched interlinking of rivers project to address this problem. Reasons of unequal water distribution in northern and southern rivers:

1. Snow fed or Rain fed: North Indian Rivers are snow-fed river as well as rain-fed. But the South Indian Rivers are only rain-fed.

2. Sources: All the North Indian rivers have their sources at much higher altitude especially in the

Himalayas. But the South Indian Rivers have their sources at much lower altitudes.

3. River flow: In winter their flow continues and is enhanced by water from the melting snows and glaciers whereas the flow of the South Indian Rivers reduces to minimum in winter.

4. Course: North Indian Rivers are subjected to drastic change of courses particularly after the landslides and earthquakes. But the South Indian Rivers flow through stable region and do not change their courses.

5. Drain areas: The drain area of North Indian rivers are geological unstable and form meanders. Whereas the drain areas of South Indian Rivers are geologically stable and are devoid of meanders Role of river inter linkage in distribution of water:

- India receives most of its rain during monsoon season from June to September, most of it falls in northern and eastern part of India, the amount of rainfall in southern and western part are comparatively low. It will be these places which will have shortage of water. Interlinking of rivers like Ken-Betwa will help these areas to have water throughout the year.
- The main occupation of rural India is agriculture and if monsoon fails in a year, then agricultural activities come to a standstill. Interlinking of rivers will be a practical solution for this problem, because the water can be stored or water can be transferred from water surplus area to deficit.
- The Ganga Basin, Brahmaputra basin sees floods almost every year. In order to avoid this, the water from these areas has to be diverted to other areas where there is scarcity of water. This can be achieved by linking the rivers like Godavari-Krishna Linking project. There is a two way advantage with this – floods will be controlled and scarcity of water will be reduced.

Challenges in interlinking the rivers:

- Interlinking of rivers will cause huge amount of distortion in the existing environment. In order to create canals and reservoirs, there will be mass deforestation. Example- Panna tiger reserve in Madhya Pradesh. This will have impact on rains and in turn affect the whole cycle of life.
- Usually rivers change their course and direction in about 100 years and if this happens after interlinking, then the project will not be feasible for a longer run.
- Other important challenge is due to topography. As there is slope from North West to north east, it will be difficult to connect rivers of these areas.
- Due to interlinking of rivers, there will be decrease in the amount of fresh water entering seas and this will cause a serious threat to the marine life system and will be a major ecological disaster.
- Due to the creation of Canals and Reservoirs, huge amount of area which is occupied by the people will be submerged leading to displacement of people and government will have to spend more to rehabilitate these people.
- The amount required for these projects is so huge that government will have to take loans from the foreign sources which would increase the burden on the government and country will fall in a debt trap.

As India is getting seriously water-stressed, so steps like enhancement of water storage capacity, river-linking project, alongside a chain of water-conservation projects like Neeranchal, Jal Kranti Abhiyan would offer a solution.

16. Explain how jet streams help in formation of cyclones and polar vortex. Also discuss impact of polar vortex on global climate with the help of suitable examples?

Ans: A jet stream develops where air masses of differing temperatures meet. Therefore, the surface temperatures determine where the jet stream will form.The greater the difference in temperature, the faster the wind velocity inside the jet stream. Jet streams can flow up to 200 mph (322 km/h), are 1000's of miles long, 100's of miles wide, and a few miles thick. Polar jet stream and cyclone formation:

- The polar jet stream provides areas of divergence aloft. The curving of the jet stream coupled with the changing wind speeds around the jet streak (strongest jet stream winds) which produces regions of strong convergence and divergence of air along the flanks of the jet.

- Areas of upper level convergence and divergence occur near jet streaks. - An area of divergence D draws warm surface air upward, and an area of convergence C allows cold air to sink.
- Jet stream also removes air above the surface storm, which causes surface pressures to drop. Jet steak can both intensify and weaken the surface cyclone. Air speeds up when entering and slow down when leaving.
- When diverging winds at upper levels is stronger than the converging wind of a surface low pressure center below it, the low will intensify. If the diverging wind is weaker, the low begins to weaken extremely, important in the formation of mid-latitude cyclones.
- Jet stream plays a major role in temperate cyclonogeneis.
- Jet streams also influence the path of temperate cyclones.
- Since these cyclones move with the westerlies (Jet Streams), they are oriented east-west.
- If the storm front is east-west, the center moves swiftly eastwards.
- If the storm front is directed northwards, the center moves towards the north, but after two or three days, the pressure difference declines and the cyclone dissipates.
- In case the storm front is directed southwards, the center moves quite deep southwards- even up to the Mediterranean region [sometimes causing the Mediterranean cyclones or Western Disturbances

(They are very important as they bring rains to North-West India – Punjab, Haryana)].

Jet streams and polar vortex formation:

- A polar vortex is an upper level low-pressure area lying near the Earth's pole. There are two polar vortices in the Earth's atmosphere, which overlie the North, and South Poles. Each polar vortex is a persistent, large-scale, low- pressure zone that rotates counter-clockwise at the North Pole (called a cyclone), and clockwise at the South Pole.
- A polar vortex strengthens in the winter and weakens in the summer due to its dependence on the temperature difference between the equator and the poles. The vortices span less than

1,000 kilometres (620 miles) in diameter within which they rotate counter-clockwise in the Northern Hemisphere, and in a clockwise fashion in the Southern Hemisphere. As with other cyclones, their rotation is driven by the Coriolis Effect.

- Normally, when the vortex is strong and healthy, it helps keep a current of air known as the jet stream traveling around the globe in a pretty circular path. This current keeps the cold air up north and the warm air down south.

- But without that strong low-pressure system, the jet stream doesn't have much to keep it in line. It becomes wavy and rambling. Put a couple of areas of high-pressure systems in its way, and all of a sudden you have a river of cold air being pushed down south along with the rest of the polar vortex system.

Impact of polar vortex on global climate:

- In early January, the polar vortex weakened and broke down, allowing fragments of cold air to slosh out of the bowl into mid-latitudes.
- The high pressure building up in the Arctic slowed down the jet stream, which caused it to buckle into deep folds and flow farther south than usual, introducing cold Arctic air into the central and eastern U.S.
- In recent years, climate scientists have noticed that the jet stream has taken on a more wavy shape instead of the more typical oval around the North Pole, leading to outbreaks of colder weather down in the mid-latitudes and milder temperatures in the Arctic, a so-called "warm Arctic-cold continents" pattern.
- But less sea ice and snow cover in the Arctic and relatively warmer Arctic air temperatures at the end of autumn suggests more wavy jet stream pattern and more variability between the straight and wavy pattern.

17. Critically analyse the potential, status and growth of pharmaceutical sector in India. Discuss the reasons for geographical concentration of pharmaceutical industry in western India?

Ans: The Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value, as per a report by Equity Master. India is the largest provider of generic drugs globally with the Indian generics accounting for 20 per cent of global exports in terms of volume. Of late, consolidation has become an important characteristic of the Indian pharmaceutical market as the industry is highly fragmented.

Potential of pharmaceutical industry:

a) The Indian pharma industry is on the threshold of becoming a major global market by 2020.India's pharmaceutical exports stood at US$ 16.4 billion in 2016-17 and are expected to grow by 30 per cent over the next three years to reach US$ 20 billion by 2020, according to the Pharmaceuticals Export Promotion Council of India (PHARMEXCIL).

b) The country is a significant producer of APIs and formulations. Its pharma companies include global players in generics and vaccines. Some of the top Indian pharma companies are now partly foreign-owned and are already generating more than half of their sales outside the country.

c) India has a large pool of scientific manpower which can be used in drug discovery, development and clinical trials. Its diverse genetic pool of treatment-naive population is attractive for clinical trials.

d) Economic growth has increased the buying power of India's middle class for healthcare services in general, particularly medicines. Emergence of lifestyle diseases such as diabetes, cardiovascular disease and cancer has increased the demand for medicines. Leading MNCs from Europe, the US and Japan have established a local presence.

e) The Union Ministry of Chemicals and Fertilizers has constituted a committee of joint secretaries for ensuring enhanced affordability, availability and accessibility of drugs for the citizens.

f) The future growth potential of Ayurveda, Siddha and other traditional medicine systems is huge for India.

g) High margin injectables, dermatology, respiratory, bio-similar, complex generics etc. have become an area of interest. Most of the Indian pharmaceuticals companies have been working on these.

Major companies have increased their R&D spend to build pipeline of niche drugs Status (present):

- Revenue and margins have been squeezed. Alarmed by news of inspections, warnings and import alerts, investors have fled the sector.
- Some Indian companies are developing biopharmaceuticals such as vaccines, biosimilars, insulin and monoclonal antibodies. In the near term, the biosimilars play for most firms will be confined to emerging markets, including India. As of now, Biocon Ltd, along with partner Mylan Inc., is the only company that has succeeded in filing applications for biosimilars in the regulated markets of the US and Europe.
- Indian drug makers currently facing FDA's warning letters, observations or import alerts include Sun Pharma, Dr. Reddy's, Lupin, Wockhardt Ltd, Ipca Laboratories Ltd and Divi's Laboratories Ltd.

- In a bid to promote local manufacturers and bolster the stakes of domestic players, the Union Government came out with a number of actions like putting in place an all-encompassing Patent Act; capping holdings of MNCs; compelling them to manufacture their products here and ensuring no less than 20 percent of their turnover from the medicines listed in Category I containing mostly essential medicines.
- India's vaccine regulatory body NRAI (National Regulatory Authority of India) was given the maximum ratings by the World Health Organisation (WHO) for vaccine regulations. Growth:
- Economic: Boundaries between different forms of healthcare are blurring, as clinical advances render previously fatal diseases chronic and the self-medication sector expands. Demand for medicines is growing more rapidly in the emerging economies than the industrialized economies.
- Jobs: The Indian pharmaceutical industry creates a large number of jobs—estimates suggest that India's pharma industry directly and indirectly employs nearly 2.5 million people. More than a million new jobs were created in the pharmaceutical industry in the last five years, mostly in high- skilled areas like R&D and manufacturing
- Developments: India has the highest number of USFDA approved plant (119 plants) outside the US. India accounts for over use of Drug master files and 30% of all approved ANDAs in the US placing it at the second position next only to USA.

- Labour costs are 50–55 per cent cheaper than in Western countries. The cost of setting up a production plant in India is 40 per cent lower than in Western countries. Cost-efficiency continues to
create opportunities for Indian companies in emerging markets & Africa
- India has a skilled workforce as well as high managerial & technical competence in comparison to its peers in Asia
- India has the 2nd largest number of USFDA-approved manufacturing plants outside the US
- India has 2,633 FDA-approved drug products. India has over 546 USFDA-approved company sites, the highest number outside the US.
- Government initiatives: The Government of India took up the initiative of developing the Indian Pharmaceuticals sector by creating a separate Department.
- 100% Foreign Direct Investment (FDI) is allowed under the automatic route for Greenfield pharma.
- 100% Foreign Direct Investment (FDI) is allowed under the government route for Brownfield pharma in upto 74% FDI is under automatic route and beyond 74% is under government approval route.
- The government has set short and medium term targets for key health indicators and wants to bring down the MMR to 100 by 2018-2020 and IMR to 28 by 2019. Besides this, Finance

Minister announced preparation of action plans to eliminate Kala Azar and Filariasis by 2017, leprosy by 2018, measles by 2020 and tuberculosis (TB) by 2025.

- One of the marquee schemes from 2016-17 budget, National Health Protection Scheme was expected to provide a 1 lac health insurance cover to all BPL families (upto 1 lac annual income). It was further expected that this cover would be rolled up to include families with upto 2 lacs income also.

Causes for concentration in western region:

- Pharmaceutical industry is a footloose industry (i.e. it does not require specific local resources) and hence it can occur wherever the industrial feasibility criteria are met.
- The preponderance of this industry in Western region may be explained due to a number of factors like:
- Proximity to ports (Kandla, Bhavnagar etc.) which facilitates easy export to Africa, Europe etc. Africa for long has been an important market for India's Generic Drug Industry. India exports cheap life saving drugs to African nations. The ports also help to import raw materials required for the manufacturing of drugs.
- Favorable State policy like ease of doing business, stable policies of state government (Gujarat, Maharashtra)
- Proximity to petrochemical hubs near Gujarat Coast and Mumbai.
- Easy availability of Capital (The western part of India has traditionally been the hub of trade and Capital)
- Historical factors: spirit of entrepreneurship

Issues in pharma sector:

- Revenue and margins have been squeezed. Alarmed by news of inspections, warnings and import alerts, investors have fled the sector.
- Prices have fallen with rising competition and distributors buying jointly in the US and quality issues.
- Lack of inherent skills of building an innovative/specialty business
- According to TRIPS, India to provide protection of data which not yet done. India relies on test data submitted in another country, which is seen as not professional in the industry.

Way forward:

- For the next 30-40 years, India needs to focus on innovations and strengthen its roots in biosimilars and biotechnology — a key strength of India which has not been utilized to its full potential.
- If Pharma industry is taken up as a flagship industry it will help Indian economy to grow further
- The Indian AYUSH sector needs to step up its efforts to re-establish its reputation in this area.
- Strong management systems help management to rapidly identify issues, design solutions and ensure effective implementation of solutions.
- Capability building, resourcing, work-planning and setting the right quality aspiration

18. Rare earth minerals are very significant for every nation across the world. Bring out the distribution of Rare earth minerals worldwide. Discuss the potential of Rare earth industry in India?

Ans: Rare Earth elements/minerals (REE/REM) are a set of 17 chemical elements found in the Earth's crust and used extensively in consumer products. The 17 elements on periodic table are made of the fifteen lanthanides, as well as scandium and yttrium. Rear earth minerals are further classified as light and heavy minerals.

Importance:

Because of their unique magnetic, luminescent, and electrochemical properties, these elements help make many technologies perform with reduced weight, reduced emissions, and energy consumption. They also give greater efficiency, performance, miniaturization, speed, durability, and thermal stability. They are used in the manufacture of some of the most important technologies, including:

- In Defence sector technology on vision & protection, anti-missile system, air-craft part & jet engine, communication etc.
- Advance communication devices like space satellite, fibre optic cable, signal amplification etc.
- Electronic devices like smart phones, hard drive, colour display etc.
- Clean technologies like solar energy, electric cars, fuel cells, wind turbines, hydro energy etc.
- Healthcare technologies like X-rays, lasers, MRI etc.

Distribution:

- REE reserves are more dispersed throughout the world.
- The exact estimates of distribution of REM reserve through the world differ but the trends are similar. As per the 2014 US Geological survey, out of 140 million tonnes of REM reserves worldwide, the distribution is:
  China - 40%
  Brazil - 16%
  US - 9%
  India - 2%
  Australia - 1%
  Rest of world -30%
- Rare earths are relatively abundant in the Earth's crust, but discovered minable concentrations are less common.
- China has near-monopoly position in world rare earth production, controlling over 90 percent of the rare earth market and due to the strategic significance of this resource, it has put restrictions on export of REE.
- India is realizing little potential despite having some resources. & lt;Students are advised to draw the world map to show resource distribution>

India's scenario:

- Significant rare earths minerals found in India include ilmenite, sillimanite, garnet, zircon, monazite and rutile, collectively called Beach Sand Minerals (BSM). India has almost 35 percent of the world's total beach sand mineral deposits.
- As per the 2014 US Geological survey, India holds about 3.1 million tonnes of REM reserves.
- Since China is largest player and has restrictions on the export on REE, some countries like Japan are looking to India for supply.
- The Indian rare earth industry is potentially worth Rs 90,000 crore in annual turnover, according to industry representatives.
- Indian Rare Earths Ltd (IRE) is operating the mineral sands separation plant at Chavara in Kerala to produce some rare earth minerals. Kerala Minerals and Metals Ltd (KMML), a Kerala state government undertaking, is also carrying out the mining of the beach sands minerals.

Due to importance of REM and to meet our economic and developmental goals, India need to first focus on domestic exploration of critical minerals. As India currently has no declared domestic reserves for majority of the identified critical minerals, it also needs to secure critical mineral resources through strategic acquisition of overseas mines and signing diplomatic and trade agreements, promoting R&D to find better substitutes for priority minerals and promoting scale and innovation in the recycling and material recovery sector.

19. Describe various types of weathering. Discuss how does it influence vegetation, landforms and soil?

Ans: Weathering is a static and in-situ phenomenon which involves the weakening, breaking-up, rotting and the disintegration of rocks at or near the earth's surface by physical, biological and chemical processes. The disintegrated materials of rocks do not involve any motion except the falling down of the material under the effect of gravity.

Types of weathering:

The process of weathering is of following types, but the processes involved in each are closely interrelated:

Chemical Weathering: When the rock is exposed to surface, the air and water from the atmosphere initiates chemical reactions in the surface layers of exposed rocks. The chemical reactions weaken or entirely dissolve certain constituents of rocks and weaken the rock surface. This process is enhanced where soil cover exists as soil absorbs rain-water and keeps the underlying rock in contact with water. The chemical weathering is high in humid tropics where both the temperature and moisture is high.

Example: Karst topography is the result of this type of chemical weathering. Physical Weathering: This process work more easily when the surface of rock has already been weakened by chemical weathering. It is more rapid in sedimentary rocks and takes place in several ways:

- Repeated temperature changes as in deserts where the rock becomes hot and expands during the sunshine while in night it cools and contract. As different minerals contract/expand at different rates, it causes internal stress in rocks and results into cracks or joints into outer layer as in Exfoliation.

- Repeated wetting and drying as in the coastal areas where outer layer of rocks absorbs water and expand and when they are dried by wind they shrink creating internal stress in rock, resulting into cracks or joints.
- Frost weathering: In cold areas like higher Himalayas and temperate latitudes, the alternate freezing and melting of water inside cracks splits them into smaller fragments. Biological Weathering: The weathering which is caused by the living organism mainly flora and fauna is called Biological weathering. It may occur in the following way or in any combination:

1. By Plant Roots: The roots of plants and trees penetrate into the soil in search of nutrients and water. As the root penetrates, it exerts pressure on the rock and progressively cracks the rock apart.

2. By Microbial Activity: Some plants through microbial activities releases organic acids in the soil. These organic acids are capable of breaking down the outer layer of rock through chemical reaction. Microscopic organisms like algae, moss, lichens and bacteria do this.

3. By Burrowing Animals: Burrowing animals like squirrels and rabbits can speed up the development of fissures in the rock through their burrowing actions. As this process continues, gaps and holes develop within the rock, further exposing the rocks to chemical, biological and physical weathering. Burrowing animals can as well move the broken rock pieces to the surface and so indirectly increasing the processes of rock weathering.

4. By Human Action: Human activities like mining and construction crush and widen the cracks, leading to the weathering of rocks.

Significance of Weathering:

1. Weathering is crucial base to our ecology as without it continents would be bare hard rock with no soil cover and earth would be devoid of flora and fauna.

2. Weathering is the initial process in the denudation and thus crucial for soil formation. The depth of soil depends on extent of weathering.

3. It produces natural resources like clay, sand, gravel etc. Practically all bauxite, most iron ore and some copper ore are formed and concentrated by weathering.

4. Differential weathering helps in the evolution of different types of landforms. Weathering plays important role in the development of stone lattice, tors, buttes etc.

5. Continuous removal and transfer of weathered materials through different processes of mass-translocation of rock wastes such as landslides and by the agent of erosion causes gradual lowering of the height of the affected area.

20. Why coral reefs are called rain forests of the ocean? Bring out factors responsible for coral bleaching in oceans?

Ans: Coral reefs comprise less than 0.1 per cent of the ocean's total area. Yet, they're vitally important to ocean ecosystems. Coral reefs support an estimated 25 percent of all known marine
species. And the variety of species living on coral reefs is greater than almost anywhere else in the
world. Scientists estimate that more than one million species of plants and animals are associated
with coral reef ecosystems, making reefs one of the most diverse ecosystems on the planet. That is
the reason Coral reefs are also called as the underwater equivalent of rainforests.
Coral Bleaching:
Coral bleaching occurs when corals are stressed by changes in conditions such as temperature, light,
or nutrients. When this happens, the zooxanthellae leave the corals' bodies. This changes their color
to white (as color of coral are due to algea) and can also in effect starve them of nutrients. If bleaching continues for too long, or if too many bleaching events occur in a row, corals die.
Coral reef ecosystems world-wide have been subject to unprecedented degradation over the past
few decades. Disturbances affecting coral reefs include anthropogenic and natural factors:
Natural factors:
1. Increase in sea temperature: A slight increase in ocean temperature can harm corals. For example, El Nino increase the sea temperature and destroys coral reefs. The last big El Niño in 1998 caused the worst coral bleaching in recorded history. It destroyed about 15% of the world's corals.
2. Ocean Acidification: There rise in carbon dioxide levels is increasing acidity of ocean water. This inhibits the corals ability to create calcareous skeletons, which is essential for their survival.
3. Solar radiation and ultraviolet radiation: UV radiation induces coral bleaching. Global warming causes changes in tropical weather patterns which results in less cloud cover and thus more radiation.
4. Other reasons include sub-aerial exposures, predatory outbreaks, epizootics etc.

Anthropogenic factors:

- Recent accelerated coral reef decline seems to be related mostly to anthropogenic factors like over fishing, especially using damaging practices like cyanide fishing, pollution from agricultural and industrial runoff, coral mining, development of industrial areas near coral ecosystems.
- Human induced climate change causes increased sea carbon dioxide levels and sea temperature, thus causing bleaching. Coral reefs are vital for thriving ocean ecosystems. They also directly or indirectly provide food and livelihood to 500 million people apart from important services coastal protection, medicines, recreation, and tourism. The death of corals and the resulting disappearance of reefs would result in a huge blow to the marine ecosystems and the humans who depend on them. Thus all efforts must be made to conserve them and restore the habitat.