Conquer Mains Challenge - Day 7

Posted at: 25/07/2018

GS 1

Indian Society related issues.

National Register of Citizens:

Why in News?The Supreme Court has extended by a month its June 30 deadline for the publication of the final draft of Assam's National Register of Citizens (NRC).

Background:

The first draft of the NRC, which was released in January, listed only 1.9 crore people as citizens out of the 3.9 crore people who had filed the NRC application. The updated NRC will count only those as Assam citizens who can prove their residency on or before March 21, 1971. This means that all those not included in the list run the risk of being rendered illegal immigrants.

What is National Register of Citizens (NRC)?

The NRC was introduced to identify illegal immigrants from Bangladesh and recognise the Indian citizens in Assam. It was first prepared in 1951 and Assam is the only state having this arrangement.

Why the NRC is being updated in Assam?

The NRC of 1951 is being updated in Assam since 2015 for two reasons.

- One is the 2005 tripartite agreement between the centre and state governments and the All Assam Students Union (AASU) to implement the Assam Accord. The Accord, signed in 1985 to end the anti-immigration agitation in Assam, created an exclusive cut-off date of March 25, 1971 for Indian citizenship for the residents of the state. The date for the rest of India is November 26, 1949, and for those migrating from East Pakistan is July 19, 1948. This difference of over 21 years has been a bitter pill to swallow for many indigenous communities in Assam, though most have dealt with it by now as it was the only solution available to solve the 'illegal Bangladeshis' issue.
- The second reason is the December 2014 Supreme Court directive in response to some petitions seeking implementation of the main clause of the Accord, which was the detection and deletion of "foreigners" from the state's electoral rolls.

Issues in implementation of accord

1. Policy issues

- Although India has traditionally been providing shelter to refugees from other countries in the region, it has yet to develop any national refugee laws. Nor is it a signatory to the United Nations 1951 Convention Relating to the Status of Refugees (commonly called the 1951 Refugee Convention) and its 1967 Protocol.
- In the absence of any specific law dealing with refugees/illegal immigrants, all foreigners in India are covered by the Foreigners Act, 1946, which simply defines a foreigner as "a person who is not a citizen of India." It does not distinguish between refugees and illegal immigrants, nor does it define refugees as a specific category needing humanitarian protection.

2. Security issues

- Incomplete border fencing , in the riverine areas keeps the border porous and increases the security risks
- Increased deployment of already stressed CAPF forces for effective control of law and order situation

3. Diplomatic issues

- Bangladesh election year :Implementaion of this accord could affect the relationship India enjoys with its neighbor as largest number of migrants in India are from Bangladesh and pro India regime in Bangladesh could face a backlash this elections

4. Identification and extradition issues

- Most Bengali Muslims and Hindus tend to treat it only as a tool for the majority community to harass and disenfranchise them, while the common Assamese look at it as their last chance to have an error-free electoral roll leading to tense situation in the region.

Minority dynamics in South Asia:

- Developments in India have long affected the plight of minorities across the border.
- The suspicion of dual loyalty has been a persistent source of anxiety and fear for minority communities in the Subcontinent.
- There are many instances of communal conflict in India creating a backlash against minorities in Bangladesh.

Way ahead:

The need of the hour therefore is for the Union Government to allay apprehensions presently in the minds of the people of Assam and take steps to contain any adverse fallout after the publication of the final draft of the NRC. At the same time, it also needs to spell out what it intends to do with the persons whose names do not figure in the final NRC.

Flow of Thoughts:

- What is NRC?
- Why is it being updated?
- Issues associated.
- Concerns expressed by locals.

GS 2

India and its neighbourhood.

India - Sri Lanka

Introduction *:*

The relationship between India and Sri Lanka is more than 2,500 years old. ***Buddhism which travelled from India to Sri Lanka during Ashokan Period is the strong cultural link between the two countries.***

Trade links between the two countries emerged stronger during Chola period.Both countries have a legacy of intellectual, cultural, religious and linguistic interaction. In recent years, the relationship has been marked by close contacts at all levels.

Trade and investment have grown and there is cooperation in the fields of development, education, culture and defence. Both countries share a broad understanding on major issues of international interest.

Areas Of cooperation:

Political Relations: Political relations between the two countries have been marked by high-level exchanges of visits at regular intervals.

- A notable diplomatic event in the recent past was our Indian Prime Minister's visit to Sri Lanka on 11-12 May 2017 as a Chief Guest to attend the International Day of Vesak celebrations in srilankaaddress to the Sri Lankan parliament in 2015
- India-Sri Lanka Joint Commission was established in 1992. The commission facilitates discussions relating to bilateral affairs of both the countries
- India and Sri Lanka signed a civilian nuclear energy deal in 2015. The agreement aims at cooperation to explore nuclear energy for peaceful purposes

Commercial Relations:

- Sri Lanka has long been a priority destination for direct investment from India.
- Sri Lanka is one of India's largest trading partner in SAARC. India in turn is Sri Lanka's largest trade partner globally.
- Trade between the two countries grew particularly rapidly after the entry into force of the India-Sri Lanka Free Trade Agreement in March 2000.
- According to Sri Lanka and India is among the top four investors in Sri Lanka with cumulative investments of over US$ 1 billion since 2003. The investments are in diverse areas including petroleum retail, IT.

Developmental Cooperation:

The Housing Project, with an overall commitment of over INR 1372 crore in grants, is the flagship project of Government of India's assistance to Sri Lanka.

- Under a line of credit of $167.4 million, the tsunami-damaged Colombo-Matara rail link has been repaired and upgraded. Another line of credit of $800 million for track laying and supply.
- India also continues to assist a large number of smaller development projects in areas like education, health, transport connectivity, small and medium enterprise development and training in many parts of the country through its grant funding.

Cultural Relations:

- The Cultural Cooperation Agreement signed by the Government of India and theGovernment of Sri Lanka on 29 November, 1977 at New Delhi forms the basis for periodic Cultural Exchange Programmes between the two countries.
- The Indian Cultural Centre in Colombo actively promotes awareness of Indian culture by offering classes in Indian music,dance,hindi,yoga.
- Education is an important area of cooperation. India now offers about 290 scholarships annually to Sri Lankan students.
- Tourism also forms an important link between India and Sri Lanka. Government of India formally launched the e-Tourist Visa (eTV) scheme for Sri Lankan tourists.

Defence and Security Cooperation:

- India and Sri Lanka conducts one of the largest joint Military exercises called '**MitraShakthi**'
- India and Sri Lanka conducts joint Naval exercise called '**SLINEX**'
- India is the largest provider of defence training program to Sri Lankan soldiers and Defence officials
- India, Sri Lanka and Maldives signed a trilateral maritime security cooperation in the Indian Ocean region. The cooperation aims at improving surveillance, anti-piracy operations and reducing maritime pollution

Areas of Conflict:

Fisherman Issue:

Fisherman issue arises from the complicated nature of maritime boundary between the two countries. The maritime boundary between the two countries is settled according to the United Nations Law on the Convention of Seas (UNCLOS).

1. The Indian fishermen are not aware of the distance they travel and hence mistakenly enter the Sri Lankan waters and get arrested frequently by Sri Lankan navy.
2. Sri Lanka has accused Indian fishermen of using mechanised trawlers that diminishes the catch of Sri Lankan fishermen and damages their vessels. Thus Sri Lanka wants a ban on mechanised trawlers but no settlement on these issues has been reached
3. The use of gill nets and synthetic nets by Indian fishermen has also been complained by Sri Lanka for causing damage to the ordinary nets of Sri Lankan fishermen

The Federal Perspective:

- The maritime boundary agreement that ceded the island of Katchatheevu in 1974 led to longstanding contention with with the Tamilnadu state as it was not consulted on the decision. The state demands for the retrieval of Katchatheevu and the fishing rights that were traditionally enjoyed by Indian fishermen in that region.
- The state, through its legislations has demanded centre to take actions against Sri Lankan government for its wartime crimes against Tamils. This led to cancellation of visit to Sri Lanka by our former Prime Minister Manmohan Singh for Commonwealth Heads of Government Meeting (CHOGM) in 2013.

China's Ambitions:

- China has signed many naval agreements and provides military equipments to Sri Lanka
- China plans to develop the Hambantota deep sea port and Mattala international airport in Sri Lanka
- Chinese aircraft maintenance facility in Trincomalee of Sri Lanka as it is a strategic location from our Indian defence perspective.

Way Forward:

- Resolving the long-standing Palk Bay conflict between fishermen of both countries with more bilateral engagements at the highest level of Government
- While New Delhi's anxiety over Chinese presence might be justified, it should avoid using the China lens to view Sri Lanka, respecting the country's autonomy to engage with any willing partner.
- The devolution of powers by Sri Lankan Government to ethnic minority provinces has been reported to be inadequate. India has asked Sri Lanka to bring peace to the ethnic demands through a negotiated political settlement
- Comprehensive Economic Partnership Agreement (CEPA) negotiations between the two countries are stalled for many years. This must be signed to improve the economic cooperation

In conclusion,***the more India treats Sri Lanka as an equal partner, the stronger the relationship is likely to grow***.

Flow of Thoughts:

- India and Sri Lanka- Areas of cooperation and conflicts.
- How to resolve issues and improve bilateral relationship.
- Significance of Sri Lanka for India in the IOR.

GS 3

Infrastructure: Renewable Energy.

Solar Power Potential of India

Why in News?

The 2018 Economic Survey identifies ***renewable energy as a champion sector*** under the Make in India 2.0 programme. ***India currently meets almost 90% of its annual requirement of solar panels through imports*** which affects the growth of a nascent domestic solar manufacturing sector.

Policy support for the solar sector is increasingly focussed on domestic manufacturing. So, the time is ripe for government intervention to support the sector.

India's ambitious Target:

When the union government, in 2014, proposed five-fold increase in ***targeted installed solar power capacity from 20 GW to 100 GW by 2022***, it seemed an overambitious target. The ***nation producing the highest amount of solar energy today – Germany – has only 38 GW***. No other country, including the US, has set itself such an ambitious goal. Since this announcement, the country has seen some intriguing discussions on the rationale and viability of this proposal.

Solar power potential in India:

India has vast solar power potential, where sunshine is available for long hours per day and in great intensity. As per the study conducted by ministry of new and renewable energy (MNRE), ***India's solar power potential is as high as 748 GW, against our country's cumulative installed capacity from all sources at around 275 GW***.

Why do we need to harness solar energy?

To reduce the dependence on fossils:Given the country's present high dependence on imported fossil fuels for meeting its ever-growing energy demand, India has little choice but to harness solar energy for achieving energy supply security.

To increase power production:In addition to a perennial power deficit situation faced by the country, around 300-400 million Indians do not have access to electricity. Hence, increase in share of renewable energy in the overall energy mix is critical for achieving energy security and resultant sustainable development.

Advantages of solar energy:

- ***Solar power permits decentralized generation and distribution of energy***. Hence, it presents high potential for contributing towards empowering people at grass-root levels in terms of energy access and bringing them in the mainstream of development.
- ***Solar power is one of the most promising renewable energy sources***. We cannot continue to depend heavily on fossil fuels for meeting all our energy requirements due to inherent limitations of its availability.
- ***Distributed generation channels such as solar irrigation pumps would contribute in reducing the significant burden on discoms' financial health*** by reducing grid power demand from agriculture.

Is solar power a costly source of power?

Solar power in India is largely viewed as a costly source of power. One of the primary reasons why renewable energy is being termed as an expensive source of power is because ***there is no system in existence for pricing carbon, pollution, and other environmental damage caused by fossil fuels based on conventional power generation plants***. Hence, it would be a biased approach to compare solar power with conventional sources without considering the tariff over the life cycle of a power plant.

Solar power tariff has been declining rapidly over the years and has almost reached grid parity as is evident from the results of latest round of reverse e-auction conducted by NTPC for 500 MW capacity in Andhra Pradesh under the national solar mission. These bids reassure that in the long run, solar power need not lead to any burden on the financial health of discoms.

Challenges faced by the solar sector in India:

Long term agreements:The ***power purchase agreements are for fixed terms (25 years) without any escalation clause***, even though there are many recurring expenses over this period. Subsequently, after ***failing to keep up with the changing market trends***, projects become unviable for the operators.

Low bids:Internationally, levelized cost of electricity for solar is around Rs9/kWh while that for coal is approximately Rs4.8/kWh. An expert elicitation survey on solar technologies predicted that by increasing research and development funding by 50%, the cost of solar would come down to Rs4.45/kWh by 2030. From these studies, it is difficult to justify why the ***solar bid prices in India are so low***. Bids in India have gone as low as Rs3.15/kWh.

Imports over domestic:India's solar programme is heavily dependent on imported solar cells and modules, mainly from China. In 2015-16, India had imported $2,34 billion worth of cells out of which 83.61% were from China. ***China uses predatory pricing and dumps cheap thin film solar cells to capture the Indian market*** in the absence of any anti-dumping duty imposed by India.

India also lacks a robust manufacturing base for solar components and systems. It also does not have any ***infrastructure for raw material production***. The increased reliance on thin film technologies has augmented the dependence on specific elements like "rare earth" metals in which China has a near monopoly. Under such circumstances, Indian solar project developers may find their projects unviable in the event of currency fluctuations or changes in China's policy on solar cell and module exports.

For both coal and solar power projects, the auction format used for reverse bidding is that of a sealed bid first price auction. The theory of auctions suggests

that the use of a sealed bid auction format can lead to a winner's curse in industries characterized by high uncertainty, or projects with very high time durations. Winning bidders can end up regretting their aggressive bids.

Reforms necessary:

Go for dynamic auction format:To end the uncertainty in bidding process, the solution is to go for a dynamic auction format where bidders can start from a maximum tariff and go downwards, after observing the pattern of bidding by others. This allows market information to become public, and reduces uncertainty for bidders.

Counter-cyclical policy: To reduce uncertainty there is a need to adopt a counter-cyclical policy of tendering projects. The global commodities boom of the 2000s led to a bull market for power projects. Companies raised debt capital, mainly from public sector banks at concessional terms, and external commercial entities, on risky terms, to finance power sector projects that were being tendered out by the government. This is an important cause of the current non-performing assets crisis.

Better governance:Instead of riding the global commodities boom by encouraging public sector banks to lend to private companies, and giving project clearances, the government should be a restraining influence in such circumstances. Better governance of public sector banks is urgently needed.

There should also be a clause for periodic review of power purchase agreements. Even if they are for fixed term, there should be escalation clause.

What factors make solar energy less practical than conventional energy?

- ***Solar energy works only when the sun is shining***. At night, one cannot depend on solar power.
- ***Solar systems do not operate efficiently during monsoons or winters when there is fog***. This requires blending of solar energy in the grid with thermal energy – and that poses all sorts of practical problems.
- ***Largescale solar energy farms require huge tracts of land***. Per GW, solar requires twice as much land as a conventional coal-fired power plant.
- ***Capital costs of solar installation are also higher***.

India's bid to expand solar energy world over- the International Solar Alliance:

The ***Paris Declaration establishes ISA as an alliance dedicated to the promotion of solar energy among its member countries***.

Objectives: The ISA's major objectives include global deployment of over 1,000GW of solar generation capacity and mobilisation of investment of over US$ 1000 billion into solar energy by 2030.

What it does? As an action-oriented organisation, the ISA brings together countries with rich solar potential to aggregate global demand, thereby reducing prices through bulk purchase, facilitating the deployment of existing solar technologies at scale, and promoting collaborative solar R&D and capacity building.

When it entered into force? When the ISA Framework Agreement entered into force on December 6th, 2017, ISA formally became a de-jure treaty based International Intergovernmental Organization, headquartered at Gurugram, India.

Way ahead:

To achieve the targeted capacity, it is imperative that ***an environment is cultivated which induces confidence in investors to invest in this sunrise sector***. This necessitates development of ***a prudent policy framework***, which is ably supported by regulatory commitments with respect to honouring all the contractual agreements.

The ***renewable energy Act*** proposed by the ministry of new and renewable energy (MNRE) is a vivid step in the right direction.***Implementation of the framework*** would be the catalyst for the targeted capacity additions without necessarily adding any significant fiscal burden on the relevant stakeholders.

Conclusion:

Solar power is ***not the panacea for India's energy needs***. Solar power also has its own share of issues in terms of its effect on overall grid stability, more so in the case of India, where the grid does not have buffer capacities like in the West. However, while plans are being drawn to scale up solar power, equal attention is also being provided to improve transmission corridors and grid management systems through increased investments and budgetary allocations to states to strengthen the network and deploy smart grid framework. To exploit its potential, India's policy makers must re-craft their solar strategies. Costs must be pruned, and India's inherent natural advantage of sunlight must be harnessed more judiciously.

Add- ONs for Mains:

National Solar Mission is one of the eight key ***National Missions of India's National Action Plan on Climate Change (NAPCC)***.

The objective of the National Solar Mission is ***to establish India as a global leader in solar energy***, by creating the policy conditions for its development across the country.

The Mission has set the ***ambitious target of deploying 100GW of grid connected solar power by 2022***. The target will comprise of ***40 GW Rooftop and 60 GW*** through Large and Medium Scale Grid Connected Solar Power Projects.

The mission is ***aimed at reducing the cost of solar power generation*** in the country through long term policy; large scale deployment goals and aggressive R&D.

Flow of Thoughts:

- What is Solar Energy? How is it different from other renewable energy sources?
- Advantages, challenges the sector is facing and significance for India.
- Reforms needed.
- International solar alliance.

Conservation and Disaster Management.

Forest Fires

The recent wildfire tragedy in Theni in Tamil Nadu, in which 20 trekkers lost their lives, once again brings into focus forest fires in India. Over the past few years, we have realised that these fires are not spontaneous; human beings set off fires. This tragedy raises several other issues — of approaches in fighting fires and ways of mitigating damage.

Types of forest fires:

Forest fires are normally of two types.

- ***A surface fire*** may burn primarily by spreading along the surface litter (senescent leaves and twigs and dry grasses etc.) on the forest floor.

- ***The other type is a crown fire***, in which a crown of trees and shrubs burn, and is often sustained by a surface fire. A crown fire is particularly very dangerous in a coniferous forest because resinous material given off burning logs burn furiously. On hilly slopes, if the fire starts downhill, it spreads up fast as heated air adjacent to a slope tends to flow up the slope spreading flames along with it. If the fire starts uphill, the chances of spreading it downwards are less.

Prevalence of Forest Fires:

- According to data from the environment ministry, a total of 18,451 incidents of forest fires were reported from across the country in 2013, compared with 19,054 in 2014 and 15,937 in 2015. This year has seen a jump, with at least 20,667 fires already reported as on 21 April.

· In December 2015, the environment ministry released the India State of Forest Report. According to the report, India's forest cover is 701,673 sq. km which is about 21.34% of the country.

· As per the Forest Survey of India data, almost 50% of India's forest areas are fire prone but this does not mean that fires affect 50% of the country's area annually.

- The major forest fire season in the country varies from February to June. Reports have estimated that about 6.17% of Indian forests are subjected to severe fire damage annually.

Why Indian forests are prone to forest fires?

A report titled Forest Fire Disaster Management, prepared by the National Institute of Disaster Management, a body under the Ministry of Home Affairs, in 2012, said about half of India's forests were prone to fires. 43% were prone to occasional fires and 5% to frequent fires, and 1% were at high or very high risk, the report said, quoting data from Forest Survey of India's State Forest Report, 1995, a compilation of 25 years of observations and analyses.

- ***Forest fires can be caused by both natural and man-made reasons***. In most of the cases in India, due to heavy population, human habitations have often gone closer to thick forest, resulting in forest fires.
- ***The bulk of forest fires in India occurs in the tropical dry forests of our country***, an umbrella category encompassing scrub, savanna grassland, dry and moist-deciduous forests. Almost 70% of forests in India are composed of these types.
- ***The roots of our current fire crisis lie squarely in the blanket implementation of a no-fire forest policy***. This 'one-size-fits-all' approach of fire protection is perhaps incompatible with the ecology of India's tropical dry forests.
- ***Supply of fuel by ample invasive species*** present in the forests also aid the spread of forest fires. Authorities have failed in preventing the spread of such species.

But, why are forest fires good?

- ***Wildfires are sometimes a natural process, and help forests by promoting flowering, branching and seedling establishment***. Fires that are limited to the surface may help in the natural regeneration of forests. The heating of the soil may result in helpful microbial activity, and hasten decaying processes that are useful for the vegetation.
- Recent research on the ecology and bio-geographical origin of these forests indicates that ***fire occurrence and light availability are important factors that maintain the ecosystem***.
- ***Field ecological research indicates that many tree species distinct to dry forests have co-evolved with fires and have developed fire-resistance features*** like thick, spongy bark, and can re-sprout from rootstock in response to fire.
- Also, frequent, low-intensity forest fires possibly ***prevent the proliferation of many invasive species*** which act as fuel for the spread of forest fires. Various studies and indigenous knowledge indicate that early dry season fires burn less hot, and are far less detrimental to vegetation than peak dry season fires which burn much hotter.

Causes:

Natural causes:such as lightning which set trees on fire.

- Other largely related to climatic conditions such as temperature, wind speedand direction, level of moisture in soil and atmosphere and duration ofdry spells.

· Other natural causes are friction between bamboos swaying due to highwind velocity and rolling stones that result in sparks setting off fires inhighly inflammable leaf litter on the forest floor.

· Dry forests are prone to fire in summers, e.g. Australian forests.

- The coniferous forest in the Himalayan region comprising of fir(Albiesspp), spruce (Piceasmithiana), Cedrusdeodra, Pinusroxburgii and P. Wallichiana etc. is very prone to fire.

- The most vulnerable stretches of the world to forest fire are theyoungest mountain ranges of Himalayas. With large scale expansion ofchir forests in Himalayan mountains, the frequency and intensity offorest fires have increased alarmingly.

Man made causes:

- Fire is caused when a source of fire like naked flame, cigarette or bidi,electric spark or any source of ignition comes into contact withinflammable material.

· Grazers and gatherers of various forest products starting small fires to obtain good grazing grass as well as to facilitate gathering of minorforest produce.

· Shifting cultivation (especially in the North Easternregion of India and imparts of the States of Orissa and Andhra Pradesh).

- The use of fires by villagers to ward off wild animals ,Fires lit intentionally by people living around forests for recreation. It has been estimated that 90% of forest fires in India are manmade.

How can early forest fires be prevented?

Some of the measures can be tried through the creation of forest self-help groups (FSHGs) or local forest special purpose vehicle (FSPV) — with an industrial linkage to the removal of dry needles with the help of villagers for making bio-briquettes, compost or vermicompost, composite boards, panels, etc.

This activity can also be linked with employment generation schemes like

MGNREGA, Skill India and Make in India, as well as women's empowerment schemes. This will provide a double benefit — removing the pine needles from the forest and generating employment and incomes. It's a bio-fuel and bio-energy resources are always welcome.

Migration is an indirect issue that needs to be addressed to control forest fires. The willingness of local village communities to stay in the state can be strengthened by an assurance of employment and basic facilities like healthcare, education and communication. They can be motivated by nature-related activities with a market tag, for example, organic crops and products like millets, milk, mushrooms, fruits, colourants, fibres, etc. All these activities make people vigilant and also protect their surroundings.

The conventional centuries-old method of making fire lines or firebreaks (also used as inspection paths) and burning and clearing them before the summer is also not practised properly due to a lack of manpower. Usually, a forest guard or beat guard would look after a large forest area, which is difficult to cover even over several days on the tough terrain. Therefore, the forest department needs to exclusively recruit forest-fire-fighting staff acquainted with modern technologies.

There can be other approaches to reducing the fire hazard in the monoculture/ pure chir pine forest, like the inclusion or plantation of indigenous broad-leaved, moisture-conserving species, particularly banj oak, Myrica, Alder, Rhododendron, etc at higher elevations and sal, khair, Harad, Baheda, Arjun, sissoo, etc at lower elevations. The selection of species must be done after understanding the local ecology and public needs. Besides, it's necessary to strictly follow scientific and advanced borehole methods for resin extraction.

Modern fire-fighting techniques like the Early Forest Fire Detection Using Radio-Acoustic Sounding System, Doppler radar, etc can also be used. Further, the use of modern forest fire detection and monitoring systems with help from the Forest Survey of India (FSI) and Isro, as well as creating awareness among locals along with their participation, can be a better solution.

On the scientific forestry front, a gradual arrest of the spread of chir pine forest, specially above 1,000 m, is leading to a change in forest composition. The selective green-felling of chir pine, as silvicultural thinning and improvement thinning to help the deodar-oak forests, needs to be done by presenting the case in the Supreme Court.

Dry-spell periods are increasing and the moisture regime is gradually depleting. This needs to be redressed by proper soil and water conservation measures to maintain soil moisture and recharge the natural springs.

A participatory approach is key to success in all initiatives, which reflects on joint forest management (JFM) areas by strengthening JFM committees. Similar approaches are needed in strengthening van panchayats and other local bodies.

Communication — via print or electronic media, social media, community radio — can also boost public awareness and action. Communication measures should be activated at the start of summer and some reward and recognition should be announced to motivate locals. This job can only be done with the active participation of local communities who need to be trained, equipped, authorized and supervised by local staff of the forest department.

In the US and Canada, specialised aerial fire-fighting aircraft are used to drop water, foam- and gel-based water enhancers, and other fire retarders. Hence, provision of helicopter-squads and watch towers would certainly help, especially during a crisis.

Way ahead:

Fighting fires with minimal equipment in challenging terrain is a thankless task that poses grave risks. It is perhaps time to ask whether a strict no-fire policy is relevant in ecological and societal contexts, rather than raise ineffective questions about how forest fires can be controlled or prevented through technology.

Instead of viewing forest fires as being purely destructive in nature, forest managers should perhaps expand their world view and be more inclusive to information from ecological and local knowledge systems that view fires as being both rejuvenating and revitalising.

Flow of Thoughts:

- What are forest fires? Types.
- What are the causes?
- How to prevent?
- Measures needed.
