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## News Analysis (04 Sep, 2018)

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### Panel Urges Plan to Save Himalayan Springs

Five Thematic Working Groups set up by NITI Aayog in 2017 have presented a report which aims to encourage well-being of the people in the Indian Himalayan Region (IHR).

- The five themes relate to improving water security in mountain towns and cities through revival of springs, developing responsible mountain tourism, increasing skilled workforce, transforming shifting cultivation in north eastern hill region to ensure ecological, food and nutritional security and making available required dataset and information.
- The Himalayas are the largest and tallest mountain range in the world, spanning 8 countries viz., Afghanistan, Pakistan, China, India, Nepal, Bhutan, Bangladesh, and Myanmar
- Most of northern India's river systems originate in the Himalayan region, fed either by glacial melt or the many springs that dot the mountainous landscape. The Himalayas, therefore are aptly known as 'the water tower of the earth'.

### Indian Himalayan Region

- The IHR covers ten states and four hill districts of India, viz. Jammu & Kashmir, Uttarakhand, Himachal Pradesh, Sikkim, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, among the states and the hill districts of Dima Hasao, Karbi Anglong in Assam and Darjeeling, Kalimpong in West Bengal.
- The uncontrolled demand-driven economic growth has led to haphazard urbanization, environmental degradation and increased risks and vulnerabilities, seriously compromising the unique values of Himalayan ecosystems.
- In addition to a focus on economic growth, the roadmap for sustainable development of the Indian Himalayas needs to be in sync with the relevant Sustainable Development Goals (SDGs).

- Therefore the development in the Himalayas must be fully embedded in the environmental, socio-cultural and sacred tenets of the region.

## Working Group I: Inventory and Revival of Springs in the Himalayas for Water Security

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- Mountain springs are the primary source of water for rural households in the Himalayan region.
- As per a rough estimate, there are five million springs across India, out of which nearly 3 million are in the IHR alone.
- Spring discharge is reported to be declining due to increased water demand, land use change, ecological degradation, climate change and rising temperatures, rise in rainfall intensity and reduction in its temporal spread, and the decline in winter rain.
- Besides, water quality is also deteriorating under changing land use and improper sanitation.
- Traditionally, policy makers have broadly focussed on watersheds for they are easy to demarcate.
- However, the watershed concept only accounts for surface water movement over slopes, while movement of spring water which is groundwater, is determined by underlying geology, and the nature and slope of such rocks underneath the surface.
- The concept of watershed, therefore, cannot account for water which travels outside watershed boundaries, through rock beds that slope towards an adjoining watershed.
- For spring revival, the appropriate unit is the springshed – the unit of land where rain falls (recharge area), and then emerges at discharge point, the spring.

### Recommendations

- **National Programme on Regeneration of Springs in the Himalayan Region**  
The programme will entail several short ( first 4 years), medium ( 5th – 8th years) and long-term actions (Beyond 8th year).
- **Mapping of Springs**  
Systematic mapping of springs across the Himalayas and creation of a web-enabled database/web portal on which the springs can be mapped/tagged.
- **Implementing Revival of Springs**
  - Reviving springs and sustaining them requires a combination of scientific knowledge (hydro-geology) and community ownership of the resource.
  - Focus on 'aquifer' as the unit for planning and integrate watersheds and aquifers for a 'springshed' approach.
  - Development of adaptive strategies (risk management as an adaptation measure to climate change impacts), regular long-term monitoring of springs.

- **Capacity Building**

Create a cadre of young professionals and community-based resource persons (para-hydrologists) through training and capacity building programmes. This will help in efficient use of resources allocated for springshed management.

- **Policy**

- The Government should launch a national mission/programme on springshed management.
- The subject of springs transcends several ministries like the Ministry of Water Resources, Ministry of Environment, Forests and Climate Change (MoEF&CC), Ministry of Tribal Affairs, Ministry of Rural Development, Ministry of Drinking Water and Sanitation, and key institutions like State government groundwater agencies. Hence, there is a need for **inter-ministerial coordination**.
- The Central government should promote regional efforts and platforms to exchange experiences and knowledge on springshed management.
- State governments across the IHR (and also non-Himalayan States) need to take a proactive role in mapping and revival of springs as depletion/drying has socio-economic implications.
- Mainstreaming of springshed management with other developmental programmes at National and in particular at the State level to facilitate more convergence with government schemes (e.g. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in Sikkim).

- **Cross-Cutting Issues**

Scientific knowledge from assessments on status of springs and techniques of springshed management need to be translated into simple language and communicated for policymaking and development of climate adaptation projects.

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## Ethanol Blending Might Not Work for India

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India should increase the use of biofuels to reduce dependence on oil imports but that could strain the country's water resources and affect food availability.

- Among biofuels, ethanol is one of the most viable alternatives, and the government intends to raise ethanol blending in petrol to 20% by 2030 from the current 2-3%.
- As the ethanol molecule contains oxygen, it allows the engine to more completely combust the fuel, resulting in fewer emissions and thereby reducing the occurrence of environmental pollution.

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## Ethanol Blending and its Purpose

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- In India, ethanol is mainly derived by sugarcane molasses, which is a by-product in the conversion of sugar cane juice to sugar.
- Ethanol blending is the practice of blending petrol with ethanol.
- Many countries, including India, have adopted ethanol blending in petrol in order to reduce vehicle exhaust emissions and also to reduce the import burden on account of crude petroleum from which petrol is produced.
- It is estimated that a 5% blending (105 crore litres) can result in replacement of around 1.8 million Barrels of crude oil .
- The renewable ethanol content, which is a by product of the sugar industry, is expected to result in a net reduction in the emission of carbon dioxide, carbon monoxide (CO) and hydrocarbons (HC).
- Ethanol itself burns cleaner and burns more completely than petrol it is blended into.

## Concerns with Ethanol Blending

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- While India has become one of the top producers of ethanol but it lags top producers, the US and Brazil, by a huge margin and remains inefficient in terms of water usage.
- India's water requirements for producing ethanol are not met through rainwater.
- Water footprint, that is water required to produce a litre of ethanol, includes rainwater at the root zone used by ethanol-producing plants such as sugarcane, and surface, ground water, and fresh water required to wash away pollutants.
- India uses more surface and ground water than the US and Brazil. Most of our daily uses of water come from this source.
- Moreover, India has low internal surface and ground water compared with both countries.
- Sugarcane is another limited resource that affects the ethanol blending in the country.
- In order to achieve 20% blend rate, almost one-tenth of the existing net sown area will have to be diverted for sugarcane production. Any such land requirement is likely to put a stress on other crops and has the potential to increase food prices.
- India's biofuel policy stipulates that fuel requirements must not compete with food requirements and that only surplus food crops should be used for fuel production, if at all.
- Producing ethanol from crop residue can be a good alternative but the annual capacity of biorefinery is still not enough to meet the 5% petrol-ethanol blending requirement.
- Other biofuels such as Jatropha have often proven to be commercially unviable.

## Way Forward

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- Concerted efforts should be made to increase sugarcane yield and decrease water usage through better irrigation practices.
- Increase in the ethanol production capacity of bio-refineries.

- Alternatives like 3rd generation (derived from algae) and 4th generation biofuels(derived from specially engineered plants or biomass) should be encouraged.

## Biofuels

- Biofuels are fuels manufactured from biomass.
- Biomass resources are the biodegradable fraction of products, wastes and residues from agriculture, forestry and related industries as well as the biodegradable fraction of industrial and municipal wastes.

### BIOFUELS

GENERATION	CHARACTERISTICS	REMARKS
FIRST	Produced from food crops like maize, corn, sugar cane, rapeseed, palm, and soybean into ethanol and biodiesel, using a similar process to that used in beer and wine-making.	Impose significant costs on food security by demanding a share of staple crops, traditionally used solely for food and feed. Resulting in a conflict between fuel and food security. At the same time, lift the price of staple crops
SECOND	Produced from non-food crops and organic agricultural waste, which contain cellulose.	Grasses like switchgrass, non-edible oil seeds like Jatropha, castor seed can be transformed into biofuels.
THIRD	Derived from algae. Also known as green hydrocarbons	The list of fuels that can be derived from algae includes: Bio-diesel, Ethanol, and Jet-fuel.

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FOURTH	Produce sustainable energy as well as capture and store CO <sub>2</sub> by converting biomass materials, which have absorbed CO <sub>2</sub> while growing, into fuel.	At all stages of production, the CO <sub>2</sub> is captured using various processes.  Rather than simply being carbon neutral, the fourth generation biofuel production is carbon negative, since it 'locks' away more carbon than it produces and also lowers CO <sub>2</sub> emissions by substituting fossil fuels.
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### **Advantages of Biofuel**

- Renewable Energy source.
- Non-toxic & Biodegradable.
- Contains no sulphur that causes acid rain.
- Environment friendly-less emissions.
- Has rural employment potential.

[Read more...](#)

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## **Drug-resistant Super-bug Spreading in Hospitals**

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The scientists from Australia have warned of a superbug, resistant to all known antibiotics, that can cause "severe" infections or even death, is spreading undetected through hospital wards across the world.

- The research said that bacteria is spreading rapidly because of the practice of using multiple antibiotics to treat bacterial infections in patients admitted in Intensive Care Unit.
- The bacteria spreading is known as Staphylococcus Epidermidis, is related to MRSA superbug.
- It's found naturally on human skin and most commonly infects the elderly or patients who have had prosthetic materials implanted, such as catheters and joint replacements.
- There is a need for better understanding of how infections spread.

### **What is MRSA?**

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- MRSA stands for Methicillin-Resistant Staphylococcus Aureus (MRSA).

- Methicillin, a form of penicillin was introduced to treat the penicillin-resistant *S. aureus* bacteria. Methicillin was one of most common types of antibiotics used to treat *S. aureus* infections; but, in 1961, British scientists identified the first strains of *S. aureus* bacteria that have developed resistance to methicillin and it was named as MRSA.

## What is Antimicrobial Resistance(AMR)?

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- Antimicrobial resistance happens when microorganisms (such as bacteria, fungi, viruses, and parasites) change when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics).
- AMR threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses, and fungi and is an increasingly serious threat to the global public.
- Without effective antibiotics, the success of major surgery and cancer chemotherapy would be compromised. The cost of health care for patients with resistant infections is higher than care for patients with non-resistant infections due to longer duration of illness, additional tests and use of more expensive drugs.

## Why AMR occurs?

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Antimicrobial resistance occurs naturally over time, usually through genetic changes in microbes. However, the misuse and overuse of antimicrobials (mostly antibiotics) is accelerating this process.

## Spread of AMR Microbes

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Drug-resistant Microbes can spread between people and animals, including from food of animal origin, and from person to person:

- Poor infection control
- Inadequate sanitary conditions
- Inappropriate food-handling

## WHO Initiatives for Preventing AMR Spread

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WHO provides assistance to countries in developing the action plan to deal with anti-microbial resistance:

- World Antibiotic Awareness Week  
Held every November since 2015 with the theme “Antibiotics: Handle with care”
- The Global Antimicrobial Resistance Surveillance System (GLASS)  
The WHO-supported system supports a standardized approach to the collection, analysis, and sharing of data related to antimicrobial resistance at a global level to inform decision-making, drive local, national and regional action.
- Global Antibiotic Research and Development Partnership (GARDP)  
A joint initiative of WHO and Drugs for Neglected Diseases initiative (DNDi), GARDP encourages research and development through public-private partnerships. By 2023, the partnership aims to develop and deliver up to four new treatments, through improvement of existing antibiotics and acceleration of the entry of new antibiotic drugs.
- Interagency Coordination Group on Antimicrobial Resistance (IACG)  
The United Nations Secretary-General has established IACG to improve coordination between international organizations and to ensure effective global action against this threat to health security.

## The Government of India's Initiatives to Combat Anti-Microbial Resistance:

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- National Action Plan to Combat Anti-Microbial Resistance  
The ambitious and comprehensive plan highlights the need for tackling AMR across multiple sectors such as human health, animal husbandry, agriculture and environment .
- India's Red-Line Campaign
  - To prevent the misuse of anti-biotics, Government of India came up with "Red-Line Campaign" to spread awareness about the misuse of antibiotics.
  - India's Red Line campaign began marking prescription-only antibiotics with a red line to curb their irrational use and create awareness on the dangers of taking antibiotics without being prescribed.
  - Under it, all prescription only antibiotics will be marked with a vertical red line on the packets. The red line antibiotics packets should be consumed on doctor's advice and the patients need to complete the full course prescribed by the doctor.

### **What is Superbug?**

- Superbugs are bacteria which have developed resistance to most of the antibiotics available to the human.
- Examples of Superbug: NDM-1 Superbug (New Delhi Metallo-beta-lactamase-1)



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## President's Visit to Cyprus

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President Ram Nath Kovind visited Cyprus in the first leg of his visit to three-nation in Europe.

Memorandum of Understanding signed

- MoU between Financial Intelligence Unit, India and Unit for Combating Money laundering of Cyprus to facilitate investment cross-flows.
- MoU on cooperation in the field of environment.

## Importance of Cyprus

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- Nuclear Suppliers Group membership and UNSC reform
  - Cyprus is the member of 48-Member Nuclear Suppliers group and India is seeking membership of NSG. Thus, support of Cyprus is vital for India to gain membership of NSG.
  - Cyprus has also shown favor for UN- Security Council Reform and publicly endorsed its support to India's bid for a permanent seat in the reformed UNSC.
- Cyprus as European Union Member

Cyprus is a member of European Union since 2004. Cyprus is also a part of the Eurozone. Thus, Cyprus can prove to be an important base for Indian industries to invest in the European Union.
- Economic relations

**India has substantial economic ties with Cyprus. Cumulative foreign direct investment (FDI) from Cyprus to India amounts to USD 9.2 billion, making it the 8th largest investor in India.**

## Republic of Cyprus

- The Republic of Cyprus is an island country in the Eastern Mediterranean and third largest and most populous island country in the Mediterranean.
- It was divided in North and South Cyprus in 1974 after Turkey invaded Cyprus after a Greece backed military coup in Cyprus.

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## Important Facts for Prelims (4th September 2018)

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### INDIAN ROOFED TURTLE

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- In order to save the Indian Roofed Turtles (*Pangshura tecta*) in the Lota Devi temple pond in West Bengal Jalpaiguri district, NGOs Society for Protecting Ophiofauna and Animal Rights (SPOAR) and Wildlife Trust of India have decided to install an idol of Vishnu in his Kurma (turtle) avatar at the temple complex. The religious sentiments of devotees will be used to help reduce pollution in the pond.
- *Kurma* avatar is **second Avatar of Lord Vishnu** in the form of a turtle to support the foundation for the cosmos.

### Indian Roofed Turtle (*Pangshura Tecta*)

- **Habitat:** Small rivers, stagnant water bodies and sometimes in large rivers.
- **Geographic Range:** Indian Roofed Turtle are found in Pakistan, India (Ganges, Brahmaputra and Indus River drainages), Bangladesh and Nepal.
- **Protection Status:**
  - CITES: Appendix 1
  - Wildlife (Protection) Act, 1972: Schedule 1
  - IUCN Red List : Low Risk, Least Concern.
- **CITES** stand for Convention on International Trade in Endangered Species of Wild Flora and Fauna.
  - Under Appendix 1, CITES prohibits International trade in specimens of these species except when the purpose of the import is not commercial e.g. scientific research.
- **WPA, 1972 (schedule 1)-** provides absolute protection and offences under these are prescribed the highest penalties.

## GM Mustard Trial

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The Genetic Engineering Appraisal Committee (GEAC), the apex body deciding on genetically modified organisms in the country, has put off a decision on allowing tests to study GM mustard's impact on the honeybee population.

### GM Mustard

- Dhara Mustard Hybrid (DMH -11) is the transgenic mustard in question, has been developed by a team of scientists at Delhi University led by former vice-chancellor Deepak Pental under a government-funded project.
- In essence, DMH -11 uses three genes from soil bacterium that makes self-pollinating plants such as mustard amenable to hybridisation.
- This provides the local crop developers with an opportunity to develop more easily the versions of mustard with custom traits such as higher oil content and pest resistance.
- Adverse impact on biodiversity, health, ecology etc are the concerns related to DMH-11.

- Recently Environmental activists have objected to the approval of DMH-11, as the transgenic variety may be detrimental to the survival of honeybees.

### **Genetic Engineering Appraisal Committee (GEAC)**

- GEAC functions in the Ministry of Environment, Forest and Climate Change (MoEF&CC).
- It is responsible for appraisal of activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.
- The committee is also responsible for appraisal of proposals relating to release of genetically engineered (GE) organisms and products into the environment including experimental field trials.
- GEAC is chaired by the Special Secretary/Additional Secretary of MoEF&CC and co-chaired by a representative from the Department of Biotechnology (DBT).