Bumblebees dying due to climate change (Environment and Biodiversity ,GS paper 3 ,The HIndu)

Climate change is shrinking the geographic range of many bumblebee species in North America and Europe, putting them in danger of future extinction, scientists say.

In a study of 67 species, researchers found that a geographic squeeze occurred on both continents over the past 40 years – While the northern borders of each species' territory remained about the same on average, the southern borders generally moved northward.

That shift, by more than 100 miles (160 kilometers) in some cases, was most pronounced for species in the southern parts of the study areas. In North America, the study extended from the southern United States to northern Alaska.

The range loss implies that populations have declined and are on the road to disappearing, said study leader Jeremy Kerr, of the University of Ottawa in Canada. Results were released Thursday by the journal Science.

Analysis showed the changes were not due to differences in land use or the use of pesticides.

"The only explanation we've got is that it's too hot for them," he said.

Bumblebees are furry-looking and wild cousins of honeybees. They play a crucial role in nature by pollinating wild plants and some crops such as tomatoes and blueberries.

He said that because the geographic ranges of species overlap, the new study does not mean that vast areas of the continents have lost bumblebees completely. Rather, it means that many areas host fewer species than they used to. Such loss of diversity can hamper an environment's ability to cope with changes like droughts, he said in an interview.

The bee trend was surprising because other land creatures like butterflies have extended their range north while maintaining their southern boundaries, researchers said.

His study drew on museum records of bumblebees captured by naturalists and researchers over decades. It focused on about 423,000 cases where the species, location and year of capture were known. Researchers set a baseline distribution of the species found between 1901 and 1974, and looked for changes at later time periods, most recently 1999 to 2010.

India and the Satellite Launch Market (IDSA , GS paper 3 , Defence ,Prelims)

The successful launch of the PSLV-C28/DMC3 on July 10, 2015 takes the number of satellites launched by India for foreign clients to 45. The July 10 launch was the 30th flight of the Polar Satellite Launch Vehicle (PSLV); of these, 29 have been successful. This speaks volumes about the quality of this vehicle, which is essentially used for launching satellites that weigh less than two tonnes into Low Earth Orbit (between 300 and 800 km above the earth's surface).

On its 30th flight, the PSLV placed five satellites in orbit for Surrey Satellite Technology Limited (SSTL), United Kingdom. The overall lift of mass of the mission was 1440 kg, the heaviest commercial mission ever undertaken by Antrix Corporation Limited, the commercial arm of ISRO which was established in 1992. Previously, in June 2014, the PSLV-C23 mission had carried satellites weighing 765 kg for foreign clients. All these satellites are placed in a Sun-Synchronous Orbit (SSO, approximately 600 km above the earth's surface). In the past, ISRO has launched much heavier payloads into SSO. For example, in April 2012, PSLV C-19 placed in orbit India's radar satellite RISAT-1, which weighed 1858 kg. From the commercial point of view, every kilogramme of weight adds to the cost of the launch, with a 1440 kg payload earning higher revenue than a 765 kg payload. The first satellite ever launched by the PSLV for a foreign client was for Germany in 1999. The German satellite weighed 45 kg. Now, Antrix has also bagged a contract to launch a 800 kg German satellite called Environmental Mapping and Analysis Program (EnMAP).

Along with satellite launching services, Antrix also provides various other services on commercial terms such as satellite building, transponders for broadcasting and telecommunication purposes, remote sensing data and other support services. Among these, providing launching services is unique given that only ten countries in the world have rocket launching capabilities. Of these countries, the US, Russia, EU, Japan, China and India make their services available commercially. (Other countries like North and South Korea, Iran, etc. have only rudimentary launching capabilities). Private companies are also trying to make inroads into the satellite launch business. Presently, the US-based Space X is providing such services.

The satellite launch business has two basic categories: launching satellites into LEO, with such satellites usually belonging to less than two tonnes weight category; and, launching three to five tonne satellites, normally designed for communications purposes, into the Geostationary Orbit (36,000 km above the earth's surface).

The following table presents the salient details of the 45 satellites launched by ISRO for foreign clients so far:

Satellite Category	Number of Satellites	Remarks
1 to 10k g (nano)	20	Multiple utility, University students to Military
11 to 100 kg (micro)	13	Scientific inquiry
101 to 500 kg (mini)	10	Remote sensing purposes

501 to 1000 kg (medium)	02	Remote sensing/Weather

Most of these satellites carried by ISRO to space were launched as an appendage to various Indian missions. The total of weight of the first 35 satellites launched by India is 2355.2 kg; taking all 45 satellites into account, this figure reaches 4560.2 kg. India's latest two missions carried more than 2000 kg of weight, making them commercially viable. To earn decent revenue, India needs to increase dedicated commercial missions. It need not remain content with carrying nano and micro satellites. There is a need to device a business model to place various categories of satellites in LEO. However, it needs to be emphasised here that nano and micro satellites are becoming increasingly popular.

Till date, India has launched satellites for a total of 19 countries. The global distribution of India's clientele appears to be skewed, however. India has mainly launched satellites for European customers. A total of eight satellites have been launched for Asian states and one each for African and Latin American clients. India is proposing to launch a SAARC satellite in 2016, indicating that it is exploring the possibility of using satellite technology as a foreign policy tool. In the recent past, China has launched satellites for Pakistan and Sri Lanka, while Afghanistan has purchased a European satellite. India needs to expand its space footprint over Asia.

At present, the global satellite launch market is entering an exciting phase. The entry of private players in particular is making competition stiffer. For many years, the space agencies of Russia, US and the European Union have been at the forefront of the space launch business. Space launches being a risky and expensive business, states have always been at the forefront of investment. Even the growth of the space industry has been possible mainly because of state support. Private enterprises like Boeing, Space X and others, also get considerable support from NASA, the US space agency. For India to make further inroads into the global launch industry, there are two immediate requirements: the design of the PSLV needs to be shared with the Indian private industry and, in future, commercial launches should be handled by them (ISRO already has plans to this effect); and India needs to develop more launching sites so that more launches in a year could be undertaken.

During the year 2014 Russia, the US and China have been responsible for almost 80 per cent of global launch activity (both state-specific and commercial launches). In 2014, Russia launched 36 rockets carrying satellites, while the US and China had 23 and 16 rocket launches, respectively. India averages around three rocket launches per year (both in 2014 and 2013 India had carried out three launches). Today, many countries are keen to have their own satellites. India has a great track record with a proven launch capability and hence becomes a choice for these countries. Also, there are unconfirmed reports suggesting that India provides launch services at about 75 per cent of the price charged by the space agencies of other countries. Hence, getting business is not an issue. But the real challenge lies in developing the requisite infrastructure.

During the last two decades China has shown astonishing progress in the space arena, although it has moved only slowly in the commercial launch services sector. Its first satellite launch for a foreign client occurred in 1985. Yet, it has launched only 46 foreign satellites so far. China has been using its launch expertise more for strategic and diplomatic (read energy and minerals) rather than commercial reasons. For instance, in South Asia, China has been helping Pakistan; and in Latin America and Africa, it has made inroads by assisting Venezuela and Nigeria.

Further, it needs to be noted that China's hands are tied when it comes to attracting European and US customers because of its uneven launch record. It has been providing launch services to foreign clients through the China Great Wall Industry Corp since the 1990s and uses the Long March 3 rocket for the purpose. During the early 1990s, some US firms were using Chinese launch services. There were some launch failures and particularly after the failure of the Long March 3B rocket, an enquiry was ordered. The enquiry led to evidence that a US-based company M/S Loral & Hughes had committed a serious export control violation; Great Wall Industry had received sensitive technology with military applications during the course of providing satellite launch services to Loral & Hughes. In 1998, the US placed a ban on US firms using Chinese launch services.[1] The US also had suspicion that Great Wall Industry had supplied the Iranian military with dual-use components that could be used in the Iranian missile programme. Although the US had lifted the sanctions imposed upon the Great Wall

Industry on June 19, 2008, an element of caution continues to hamper the use of Chinese space launch vehicles.

Based on various reports about the performance of the global space industry during the last few years, it has been observed that broadly the US has around a 40 per cent share of the global launching services market (USD 2 to 2.4 billion per year), Europe accounts for 25 per cent, and Russia 20 per cent. Countries like China and India have very less share of the launching services market, two to three per cent or even less. Europe controls about 60 per cent of the market in the category of heavy satellite launches, thanks to the successful French enterprise Ariane Space. India also heavily depends on this agency to launch its communication satellites (one such launch costs about USD 85 to 90 million, Rs. 500 core). The entry of Space X is expected to change the profit calculus of this market.

India is yet to make its Geostationary Satellite Launch Vehicle (GSLV) operational. Hence, it is likely to take some more years for India to develop and demonstrate expertise in launching heavy satellites. At present, entry into the heavy satellite launch market appears to be a distant dream for India.

Euroconsult, a global consulting firm specializing in space markets, published a detailed forecast in 2014 for the coming decade. According to this forecast, 1,155 satellites could be built and launched through 2023. In the commercial space sector, the forecast anticipates a total of 350 satellite launches over the decade, with these satellites equally divided between the geostationary and lower altitude orbits.[2] This means approximately 175 satellites are out for grabs for the launching industry in the LEO category. The following statistics present actual figures about a particular category of satellites launched (civil+military+commercial) in the last few years. In particular, the figures for the years 2013 and 2014 indicate that the market for small satellites could be much above the forecasted figure.

Year	Nano/micro 1 to 50 kg
2009	26
2010	25
2011	20
2012	36
2013	92
2014	158

In recent years, many states as well as private players have started showing interest in developing Cubsats. This category of satellites weigh between one and 1.3 kg and their volume is exactly one litre (10 cm cube). They could be said to belong to the group of nanosats (1 to 10 kg) or Picosats (0.1 to 1 kg). Some research is also underway on another category of satellites called Femtosat (weighing 0.01 to 0.1 kg). Although the small category market is likely to grow, there is no separate launch vehicle available to launch these satellites. While initially many of these satellites could find applicability mainly in the military realm, simultaneously the commercial market is also likely to grow.

In collaboration with private industry, agencies like NASA are trying to develop a low cost, reliable, on-demand, routine space access vehicle. Their broad idea is to develop a Nano-Micro Satellite Launch Vehicle (NMSLV) to carry satellites weighing approximately 20 kg to LEO.[3] Presently, the concept of NMSLV is under research.

China has not yet displayed much interest in cubsats.[4] However, it is developing a new rocket named *Kuaizhou* (fast boat). This is a mobile, solid-fuel, space launch vehicle that can launch a 400 to 430 kg payload to approximately 500 km in SSO. Already two successful launches by this rocket launcher have taken place during the last two years.[5] This rocket has the capability to launch satellites from a mobile platform. Investment in small satellite launchers take China closer to ideas like ‘launch on demand’, which has a larger strategic significance.

India has been launching satellites for foreign clients for 15 years. Yet, it is likely to take some more time for it to establish itself as a serious player in the commercial launch market field. In the coming few years, India would have to concentrate on the market for the launch of less than 2 tonne category satellites into LEO. Today, India has a reliable technology available for launching such satellites. But there is no matching infrastructure to obtain larger commercial benefits. Present trend indicates that the market for launching of cube/nano/micro satellites is likely to surge. It is important that ISRO takes a conscious decision to develop a new rocket for launching small satellites. Any cost-benefit analysis in this regard needs to factor in the strategic utility of such a rocket launching system.

Mind Maps For General Studies Paper 1 , 2 ,3 and 4

Download Paper 1 and 2 [zip file]

Download Paper 3 and 4 [zip file]

Or

Download Zip File

Adequate Empowerment of the Services and Financial Oversight Yet to be Achieved(IDSA ,Defence organisation , GS paper 3)

With effect from 1 May 2015, the Ministry of Defence (MoD) has instituted a set of enhanced delegated financial powers to the three

Services, Integrated Defence Staff and its attached establishments, Coast Guard and the Armed Forces` Medical Services. In addition, the MoD has issued guidelines for the exercise of these powers, *inter alia* specifying an internal audit structure, to apparently enable the judicious exercise of the delegated powers and in a quicker time-frame. The internal finance mechanism is also proposed to be made more involved with planning and resource management, i.e. budgeting. An internal financial advisory system [*though the nomenclature used in the Indian defenceset-up is of Integrated Financial Advisers (IFAs*)], starting from principal integrated financial advisers with the Services` Headquarters and similar advisers at lower echelons of the Services, is supposed to be a key element to assist the executive authorities, i.e., the competent financial authorities, in resource deployment and expenditure management related to the national defence effort.

Since 2006, there has been a substantial enhancement of delegated powers to the Services. Broadly, the enhanced power varies from two to two-and-a-half times for stores/equipment procurement for the Army along with escalation for similar transactions of the Navy and Air Force. There are, however, a few variations. For the victualling stores of the Navy, the present powers delegated at the highest threshold to the Chief of Logistics (COL) is Rs. 100 crore and up to Rs. 3

crore per transaction to the Vice Chief of Naval Staff, respectively, to procure such stores with IFA concurrence. A change effected is that in case of some transactions, the functionaries responsible for provisioning have been empowered as against the earlier pattern wherein officers performing staff functions or in the policy formulation domain were primarily the higher expenditure sanctioning authorities. This change is welcome to the extent that those involved with programme execution and service or maintenance functions would also be responsible for the budgets and expenditure sanctions, albeit in consultation with their IFAs. (One exception is the power of sanctioning works, i.e., for accepting necessity and according administrative approval, which is vested with Service Chiefs for Rs. 50 crore per project/work.)

The framework of the delegation now formalised through the relevant government letters issued on 20 April 2015 is a shade different from those which obtained in previous years. The emphasis on internal audit through an Audit Advisory Committee (AAC) under the financial adviser of MoD, as part of an oversight mechanism for risk management, etc., conveyed through the government letters of delegation, may appear to be a new phenomenon. This is, however, not so. Internal audit always had an inherent sanctified role in defence transactions. For various reasons and circumstances, this role could not be effectively

exercised
by the designated internal audit authority, i.e., controller general
of defence accounts. There has been inhibition on the part of the
Services towards allowing the entire gamut of their transactions being
made susceptible to internal audit. The reasons cited were: sensitivity
of the transactions, wherewithal not being available with the
Services` executives to facilitate the audit as for instance in border
areas, etc. A glaring instance of defence transactions put beyond the
pale of audit is the prevailing “war system of accounting”, wherein
audit cannot verify the correctness of consumption of stores of a large
number of units and formations in THE northern and eastern sectors.
The new delegation of financial powers does not address this
shortcoming. In fact, the Comptroller & Auditor General of India
(C&AG) has refused to statutorily certify from the audit angle the
accounts related to Defence Services Estimates on the premise that
internal audit by the controller general of defence accounts has not
been exercised vis-à-vis such Service units and formations.

Furthermore, it is not clear as to why it should be necessary to have
annual audit plans, review by an AAC, etc. Internal audit is inherently
built into the role of integrated finance of MoD and its connected
set-up, i.e., the set-up of financial adviser of defence services and
its attached arm – the office of controller general of Defence
Accounts, and the latter`s subordinate offices spread

throughout the country. The statutory rules of Government of India are clear on the ambit of internal audit in all spheres of governance – civil or military, and it should not have been necessary to put in place a structured mechanism such as AAC, etc. Experience shows that, in the Indian context, more structures only lead to more bureaucratisation and delays in decisive action. MoD should have ensured that the internal audit reports of the controller general of defence accounts, with concomitant appraisal notes, on functional areas of high financial risk, regulatory violation, transactions which failed to achieve desired outcomes and also areas where internal audit was constricted or not allowed by circumstances or deliberate design, are mandated to be placed before Parliament and the Standing Committee on Defence along with the detailed demand for grants of the Ministry, instead of being considered only as an input to the finance division of MoD as appears to be the case at present.

Another fundamental issue, the financial empowerment of the Services by making them responsible for the policies and programmes they formulate, working out the resources they need, and their implementation in the most judicious and economic manner, does not seem to have been addressed. The Services, therefore, are not *de facto* responsible for the budget provisions allocated to them, object and

programme-wise. Apart from budget-related decisions, the major extent
of both Revenue and Capital expenditure powers continue to remain
vested in the MoD. While this legacy situation prevails, the Services
also are not enthusiastic about involving their internal finance, i.e.,
their IFAs, in the budget formulation process. It is only in budget
monitoring to an extent, and too limitedly without having any role in
re-adjustment and re-appropriation of funds at budgetary landmark stages
like `Revised Estimates` and `Final Estimates`, that these advisers
are associated by the Services. To compound the situation, MoD Finance,
i.e., the integrated finance division of this Ministry – which works
out the final budget requirement and obtains the Defence Secretary`s/Raksha Mantri`s approval before referring to the Union
Finance Ministry for subsuming the Defence Ministry`s requirement in the
Union Budget – does not obtain any significant institutionalized input
from the Services` HQs` integrated financial advisers in the matter.
In the light of the above-indicated arrangements and institutional
framework, responsibility will continue to remain diffuse in finance
matters between the MoD and the Services` HQs. Comprehensive
Parliamentary oversight of the Services` resource management is also
likely to be affected. The institution of the C&AG and their audit
mechanism, the audit reports they generate, for Parliamentary scrutiny

in general and in detail through the Public Accounts Committee, remain consequently the only effective means of financial oversight. The Union Government may seriously consider comprehensive and effective empowerment of the Services, with internal finance involved at all stages, on par with the system prevailing in the Civil realm and within the ambit of existing statutory rules, without any special dispensation for the Services. Though the creation of Chief of Defence Staff institution may facilitate single-point coordination of advice on operational matters to the political executive, this by itself will not be sufficient for optimization of the national defence effort. Instead, a move towards converting the Services` HQs as departments of the government within the scope of Allocation of Business Rules, and with responsibility to Parliament for obtaining Defence appropriations, etc., may be in the long-term interests of the country. Within such a structure, the Services will be measurably empowered, Parliamentary oversight will be more effective, and internal audit by the controller general of defence accounts and statutory audit of C&AG can function as part of a continuum.

Government report reveals weak spots in functioning of Indian pharma industry (Pharma Industry ,GS paper 3 ,DTE)

Staff crunch, transparency issues and outdated trial methods plague monitoring activity

To bring about transparency, digitalisation of clinical trials has been recommended by the government task force (Credit: Taki Steve/Flickr)

A latest government report shows that India suffers from poor monitoring quality when it comes to drug inspection due to the lack of adequate staff.

The Central Drugs Standard Control Organization (CDSCO), which regulates the import of medicines in the country and gives approval to new drugs and clinical trials, has only 340 sanctioned posts.

This is compared to the 13,000 sanctioned posts comprising technical as well as administrative staff of the US Food and Drug Administration (USFDA). The CDSCO also conducts meetings of the Drugs Consultative Committee (DCC) and the Drugs Technical Advisory Board (DTAB).

The irony is that of these 340 posts, only a few have been

filled up
so far, reveals a task force report released on Monday. It was set up to
give suggestions on the future growth of the Indian pharmaceutical
industry. The task force was constituted by the Ministry of Chemicals
and Fertilizers, Government of India, in 2014.

More drug inspectors needed

The number of foot soldiers is very few, according to the report.
India needs at least 3,200 drug inspectors, but has only 1,349 sanctioned posts at present. Of this, 500 posts are lying vacant.

The report says that drug inspectors should be recruited for effective monitoring of various drug manufacturing units and distribution outlets. There should be one drug inspector each to look
after 50 such units and monitor distribution outlets. There are
approximately 600,000 drug retail sales outlets and around 10,500 drug
manufacturing units across the country.

Transparency, drug pricing

As far as transparency in clinical trials is concerned, the task
force has recommended the digitalisation of clinical trials. The report
says trials, licensing and quality control need to be computerised and
made available online to expedite the process.

Besides, the ministry also favours the creation of a single window

medicine monitoring IT system to link the headquarters, respective state offices and government hospitals for smooth communication.

The task force report also gives suggestions on effective price control. It says that there is a need to review the implementation of Drug Price Control Order (DPCO), 2013 to resolve the problems of implementation. This is a notification-cum-order which empowers the National Pharmaceutical Pricing Authority (NPPA) to regulate the prices of essential drugs. The DPCO suggests that the government should implement price control mechanisms through a consultative approach.

The report has been prepared after consulting private players and the issue of accessibility of drugs to the masses has been largely overlooked, the ministry says. Industries have challenged all efforts to minimise the prices of essential medicines.

The civil society has also raised the issue, claiming that the existing mechanism does not make essential drugs accessible to the poor and that drug manufacturing companies are still making huge profits on their products.

Government’s stand

While releasing the report, Union Minister of Chemicals and Fertilizers Ananth Kumar said that the government wanted to encourage a

robust pharmaceutical industry in the country that is standardised,
innovative and competitive.

Setting up the task force was one of the major initiatives of the
Centre, he added. According to the minister, the government is keen on
the early implementation of the recommendations of the task force and it
would come out with an action-taken report based on these recommendations in 100 days.

Secretary of the Department of Pharmaceuticals V K Subburaj said
exports by Indian pharmaceutical companies was a successful venture.
However, regulations in this sector, are weak and it is affecting
further growth, he added.

Exposure to toxic parts of PM2.5 during pregnancy harmful for newborn health (DTE ,Pollution,Health ,GS paper 3)

Inhaling sulphur, sulphate, copper, iron, nickel and zinc through
PM2.5 can trigger maternal oxidative stress and affect the

growth of
the foetus

Photo: Sayantoni Palchoudhuri

A new study conducted in Europe has found that maternal exposure to
particulate matter (PM) constituents such as sulphur and secondary
combustion particles may adversely affect birth weight and head
circumference of newborns. LBW (birth weight less than 2.5 kg) is a
predictor of infant morbidity and mortality.

A mere 200 nanogramme per cubic metre-increase in sulphur in PM2.5 is
found to be associated with an increased risk of low birth weight
(LBW). Nickel and zinc in PM2.5 concentrations were also associated with
this outcome.

The study—Elemental Constituents of Particulate Matter and Newborn's Size in Eight European Cohorts—published
in Environmental Health Perspective examined the associations of eight
elemental constituents in PM2.5 and PM10. It assessed data of 34,923
births during 1994 to 2008 in Europe and estimated the annual average
concentrations of eight constituents of PM2.5 and PM10 including copper,
iron, potassium, nickel, sulphur, silicon, vanadium and zinc at
maternal homes in different parts of Europe during pregnancy.

It was found that exposure to specific constituents of PM2.5,

especially traffic-related particles, sulphur constituents, and metals
was associated with decreased birth weight. Inhalation of PM can trigger
maternal oxidative stress, damage cells, cause inflammation and changes
in the blood system, decrease placental blood flow, disrupt transplacental oxygenation, leading to poor growth of the foetus.

The study also found that all the elemental components, with the
exception of potassium, were significantly associated with smaller head
circumference in newborns. Head circumference is associated with
cognitive ability and child intellectual quotient.

The study was led by scientists from Centre for Research in Environmental Epidemiology, Barcelona, Spain, and jointly carried out by
several research institutions.

In India, it is often stated that PM from crustal sources (such as
dust) is largely responsible for poor air quality in cities like Delhi.
But emerging evidence, such as the findings of this study, makes it
imperative for regulators to also look into the effects of tinier toxic
constituents of combustion sources in PM

All Government Schemes very important for exam by GK Today

Download

Pak to participate in SAARC satellite project meeting: ISRO(GS Paper 3, Sci and Tech, Prelims,The Hindu)

The SAARC countries, including Pakistan, will participate in the ambitious SAARC satellite project
The SAARC countries, including Pakistan, will participate in the ambitious SAARC satellite project conceived by Prime Minister Narendra Modi, top official said on Tuesday.
When asked if Pakistan was giving a cold shoulder to the project, the Chairman of Indian Space Research Organisation (ISRO) A S Kiran Kumar said, “That is not strictly correct. We have on 22nd (June) a meeting in Delhi, where all these seven SAARC countries will participate.”
Familiarisation programme
“There is a one day programme of familiarising them with what are the things that are possible and how to go forward. This discussion is on and we are told that all of them are participating,” Mr. Kiran Kumar said.
After the successful launch of PSLV C–23 last year, Mr. Modi had called for a greater collaboration among the SAARC countries and launch of a common satellite for the region.
It was also seen as a move to counter China in South Asia, as

its space agency has been involved in launching satellites of several other countries. Following Mr. Modi's call, formal proposals were sent to all the SAARC countries.

Southwest monsoon is weakening as Indian Ocean warms rapidly(Geo, Climate , GS 3, GS 1)

A study shows that surface temperatures of the Indian Ocean have risen by up to 1.2°C in the past century, much larger than warming trends in other tropical oceans

Schematic illustration of the mean conditions (left) and weakening trend (right) of the monsoon

Days after India Meteorological Department (IMD) downgraded its southwest monsoon forecast for 2015, a study shows that rapid warming of the Indian Ocean is responsible for reduced rainfall over parts of South Asia during the past century.

The study, led by Indian Institute of Tropical Meteorology scientist Roxy Mathew Koll, used data from 1901 till 2012 and found a decreasing trend in summer monsoon rainfall over the central Indian subcontinent. While rainfall decreased over the region from south Pakistan up to Bangladesh, central India saw a significant reduction of up to 10 to 20 per cent in mean rainfall.

The findings of this study contradict previous studies that had shown a warmer ocean and increased land-sea temperature difference would lead to a stronger Indian monsoon.

"The changes in the Indian Ocean and correspondingly in the monsoon became prominent since the 1950s," says Koll. "The trends have been steady since though there are decadal variabilities also."

Koll and his team found that land-sea temperature difference, a key monsoon driver, has actually reduced over the South Asian region because the ocean has warmed much faster. During the past century, the ocean surface temperatures of the Indian Ocean have risen by up to 1.2°C, much larger than the warming trends in other tropical oceans. At the same time, the Indian subcontinent land mass

has witnessed “subdued” warming due to reasons which have not yet been established.

Koll says these findings are typical of the Indian Ocean. “The land-sea temperature difference is increasing everywhere in the northern hemisphere, except in the Indian Ocean-South Asian domain,” he adds.

The study explains that ocean warming also affects monsoon circulation. A warmer ocean sees large-scale upward motion of moist air. This is compensated by subsidence (downward movement) of dry air over the subcontinent, resulting in surplus rains over the Indian Ocean at the cost of the monsoon rains over land.

The study was published in Nature Communications journal on Tuesday. Results of the study have wider implications for food security in the Indian subcontinent as agriculture is still largely rain-fed.

Climate models show that the Indian Ocean will continue to warm and Koll warns the threat of anthropogenic warming is manifesting itself closer home. “We need to be as watchful of the changes in the Indian Ocean as we are about other oceans and land-atmosphere systems. This is a global issue linked to greenhouse gas emissions and needs to be tackled at all possible levels,” he says.

If the southwest monsoon is deficient yet again this year, Indian farmers are headed for their fifth consecutive crop damage and an unprecedented agrarian crisis.

GST: 2 committees to overlook, CEA Subramanian to decide on rate(economy gs paper 3,economics)

The government on Wednesday announced the setting up of two committees to facilitate the implementation of the goods and services tax from 1 April and to propose tax rates.

The government has tasked chief economic adviser Arvind Subramanian with the difficult task of coming up with a revenue neutral rate or a rate at which there will be no revenue losses to states under the goods and services tax regime.

This committee will recommend possible tax rates under GST that would be consistent with the present level of revenue collection of Centre and states,

taking into account expected levels of growth in the economy, different levels of compliance and broadening of tax base under GST, the government said in a statement. This committee will also analyze the sector-wise and state-wise impact of GST on the economy.

A previous proposed rate of 27% recommended by a sub-committee of state and central government officials was considered unacceptable and as too high by the government.

Finance minister Arun Jaitley had hinted that the new rate will be much lower.

“Neither the state finance ministers nor the central government are interested in imposing higher taxes on our own people. Therefore, this figure is going to be much more diluted. These are rates that will be decided by the GST council itself,” he had said at the time of the passage of the 122nd constitution amendment bill in the Lok Sabha.

The committee is expected to give its report within two months.

The government has also set up a steering committee having representation from the central board of excise and customs (CBEC), states and the goods and services tax network (GSTN)-the company tasked with setting up the information technology (IT) network for GST.

“This Committee shall monitor the progress of IT preparedness of GSTN/CBEC/tax authorities, finalisation of reports of all the sub-committees constituted on different aspects relating to the mechanics of GST and drafting of CGST (central GST), IGST (integrated GST-CGST+SGST) and SGST (state GST) laws/rules. The Committee shall also monitor the progress on consultations with various stakeholders like trade and industry and training of officers,” the statement said.

The government is eagerly awaiting the passage of the constitution amendment bill in Rajya Sabha. Once the upper house clears it, the bill will have to be ratified by 50% of the state assemblies. Following this, the government will set up the GST council having the union finance minister and the state finance ministers as members. This council will decide on the crucial issue of the final design of GST, including the revenue neutral rate and the threshold level or the revenue level beyond which GST will be levied on traders.