
UNIT 16 CLIMATE CHANGE POLICY

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16.1 INTRODUCTION

“We have the moral responsibility to bequeath to our children a world which is safe, clean and productive, a world which should continue to inspire the human imagination with the immensity of the blue ocean, the loftiness of snow-covered mountains, the green expanse of extensive forests and the silver streams of ancient rivers,” said the former Prime Minister of India, Dr. Manmohan Singh.

developed countries. Moreover, the debates on climate change are helping to build up a comprehensive climate change regime with a country-specific action plan. The climate change management at the international level consists of the 1992 United Nations Framework Convention on Climate Change (UNFCCC), 1997 Kyoto Protocol and the decisions taken by the signatory countries under these instruments. Even though, it was considered as a first step to address climate change and its consequences, it was not sufficient to force member States to take appropriate actions to address climate change with rapid change in environment and rising temperature. It was widely considered an inadequate instrument to combat climate change. Both the UNFCCC and Kyoto Protocol did not contain the necessary clauses to mitigate greenhouse gases (GHG) emissions, which resulted in a lack of binding obligation for developing countries. Some of the developing countries withdrew from the Kyoto protocol in the second commitment period. Hence, Parties to the UNFCCC came together and formed an Ad-Hoc Working Group at the Durban Conference in 2011. It was called as Durban Platform for Enhanced Action (ADP) to negotiate a new climate agreement by 2015 that would come into force from 2020. The four years of continuous negotiating process resulted in the formulation of the 2015 Paris Agreement, which was expected to govern, regulate and incentivise the next generation of climate actions. With this introduction, through this unit, we will discuss Copenhagen Summit; Paris Agreement; National Action Plan on Climate Change (India) and State's Action Plan in India.

16.2 OBJECTIVES

After studying this unit, you should be able to:

- discuss the history of climate change debate;
- explain the significance of Kyoto Protocol and Paris Agreement on Climate Change;
- describe Copenhagen summit 2009 and India's position in Copenhagen Summit;
- describe National Action Plan on Climate Change; and
- examine the efforts of state governments in India to address climate change related issues.

16.3 HISTORY OF CLIMATE CHANGE DEBATE

Climate change as an environmental fact has begun to be felt in the year 1987 with the release of the Brundtland Commission report, *Our Common Future*. The report highlighted the issues such as depletion of ozone layer, loss of biological diversity and the rising greenhouse gas concentration and argued for achieving sustainability by formulating effective socio-economic policies. The development of global climate change regime can be divided into five phases prior to the Kyoto protocol. The five periods are as follows;

- The foundational period expresses scientific concern about global warming.
- The agenda-setting phase (1985-88) intended to transform the scientific concern into policy matter.
- Pre-negotiation period (1988-1990) involved government in the process of climate change regime
- The formal intergovernmental negotiation (1992) impressed upon the adoption of FCCC by May, 1992
- The post-agreement phase focused on the elaboration and implementation of FCCC and the adoption of Kyoto commitments.

16.3.1 First Phase: The Emergence of Scientific Consensus

In the early 1960s, the increasing atmospheric concentration of greenhouse gas was published by the scientists from Mauna Loa, Hawaii to establish climate change as a scientific fact. The 1979 report of the National Academy of Science evaluated the existing models of the atmosphere and concluded that the increase of carbon dioxide in the atmosphere will lead to future climate change. By the mid-1980s, scientists opined that anthropogenic emission of gases like methane and nitrous oxide are also cause of concern.

16.3.2 Second Phase: Agenda Setting

The accumulation of scientific knowledge has significantly contributed towards forming both public and political opinion on the issues of climate change. Scientists across the world worked to push climate change debate into public. The establishment of the Advisory Group on Greenhouse Gases and the report of the Enquete Commission helped to translate the uncertainties of climate change science into a real-world possibility.

16.3.3 Third Phase: Early International Responses

The establishment of IPCC in 1988 is a landmark in climate change debate. The IPCC has produced comprehensive assessment reports in 1990, 1995, 2001, 2007, 2014, and 1.5°C special report in 2018. IPCC reports on the scientific assessment of global warming compelled the governments to initiate strong position with regard to climate change concern. In the Noordwijk meeting, the split occurred amongst the governments of western countries with regard to committing themselves towards addressing the challenges of climate variability. In this context, many European countries had joined the CANZ group in support of imposing quantitative limitations upon the countries to reduce the emission level of greenhouse gas. In contrast, United States and other Western States continued to give emphasis more on having a neutral position than adopting the European model of target-timetable approach in reducing the rate of greenhouse emission. Developing countries showed unity among themselves and agreed to adopt the target-time table approach and shown commitment in promoting

technology transfer to reduce the emission level. As a Plan of Action, various small island states of developing nations formed an alliance and formulate the body, i.e., Alliance of Small Island States (AOSIS) which played a key role to further FCCC negotiations in reducing carbon dioxide emission intensity. On the other hand, the oil producing states critically looked at the science of climate change and argued for adopting a go-slow approach for carbon dioxide emission reduction. Similarly, developing countries like Brazil, India and China emphasized on their right to economic growth and formed a strong opinion to accept the principle of differential responsibility in combating climate change impact.

16.3.4 Fourth Phase: Negotiation of the FCCC

In the year 1990, the UN General Assembly established the body, i.e., Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC) with specific emphasis on imposing appropriate commitments upon the countries. The primary principles included in the Convention were as follows:

- 1) **Target and Time tables:** The European Union and AOSIS advocated to follow target and timetable approach to limit the emission level.
- 2) **Financial Assistance and Transfer of Technology:** The developing countries demanded for creating a new fund towards helping developing countries in implementing the Convention.
- 3) **Institution and Implementation Mechanisms:** OECD countries including United States advocated to establish implementation machineries including scientific body, deliberate meetings, reporting, and monitoring of the implementation work to tackle the climate change problem.

16.3.5 Fifth Phase: Post-Rio Developments

UN conference on Environment and Development at Rio deliberated on issues like global climate change, biological diversity, deforestation and desertification and many treaties and agreements were signed. And it also stressed that the nation's future policies on economic development should be drafted by considering the environmental implications of socio-economic development. Agenda 21 was a special product of this conference which is also known as Earth summit. The Earth Summit led to the formation of United Nations Framework Convention on Climate Change (UNFCCC). The UN Framework Convention on Climate Change is a treaty signed by 192 countries. It does not set any binding targets on countries for cutting emissions. It only calls for stabilizing carbon emissions. But it set in motion international negotiations for settling the issue of who will cut and how much. The parties to the convention have met annually from 1995 onwards in conference of parties (COP). The Conference of the Parties is the governing body of the Convention, and advances implementation of the Convention

through the decisions it takes at its periodic meetings.

The Convention entered into force in the Berlin conference in the year 1994 to elaborate and implement the commitments to address climate change problem. The Berlin meeting had the following objectives:

- To establish an ad hoc committee to negotiate a protocol;
- To initiate joint-activities among the participating countries to carry out a survey;
- To use Global Environment Facility as the FCCC's financial mechanism; and
- To locate FCCC permanent office at Bonn.

Broadly, the negotiations in relation to climate change were subscribed to two major concerns such as: Emission-target limitations for developed nations; and establishing different mechanisms for developed nations to meet the targets. The climate change debate needs to address the issue of equity not only in relation to the future generation but also in relation to the present generation. In response to the challenge, the international community phrased the common but differentiated responsibility (CBDR) principle as the guiding principle of climate change science.

16.4 KYOTO PROTOCOL

The Kyoto protocol was adopted on December 11, 1997 at the Kyoto. It came into force in February 2005. Under the protocol, 39 industrialized countries, Annexure I countries, committed themselves to reducing the emissions by 5.2 per cent of the 1990 levels by 2012. The Kyoto Protocol was formulated on the basic principle of CBDR and specified that industrialized countries will have to take lead in the process of reduction of greenhouse gas emission. The Kyoto mechanisms include three strategies to reduce emission level such as Joint Implementation (JI), The Clean Development Mechanisms (CDM) and Emission Trading. The Kyoto protocol also assists countries in adapting to the adverse effects of climate change. It facilitates the development and deployment of techniques that can help increase resilience to the impacts of climate change. The adaptation fund was established to finance adaptation projects and programmes in developing countries that are parties to the Kyoto protocol. The fund is financed mainly with the share of proceeds from Clean Development Mechanism project activities. Kyoto protocol applies to industrial nations only. Developing countries like India and China were not required to commit to reductions because their per capita GHG emissions are much lower than those of developed nations.

The commitments included in the Kyoto protocol ranged from developing national inventories/strategies of greenhouse gas emissions, formulating and implementing national level programs with regard to mitigation and adaptation strategies of climate change, promoting and cooperating the

transfer of sustainable technology, promoting sustainable and integrated development, cooperating in preparing adaptation plans, promoting and supporting scientific research and promoting education, training and public awareness about the effect of climate change (Atapattu 2008). In the year 2001, the protocol suffered major setback because US refused to ratify which is producing 36.1 % of the carbon dioxide emission. EU and Japan supported the protocol and ratified it. Reluctance supporters are US, Australia, Russia and Canada. The major shortcomings of the Kyoto protocol are:

- Excluding developing countries from the protocol. This will reduce the effectiveness of the agreement.
- Exclusion of India and China which constitute 36% of world's population and both countries are growing economy.
- Using of older, outdated and environmentally unfriendly technologies by the developing countries, which are excluded from the Kyoto protocol.
- Growing unchecked developing countries emission.
- The Kyoto protocol only raises the awareness and not in real terms.

16.5 COPENHAGEN SUMMIT 2009

The mandate of the 15th Conference of Parties (COP) in Copenhagen is to enhance long term cooperation on climate change under the Bali action plan. The Copenhagen summit was convened to negotiate post-Kyoto protocol agreement at the UN Framework Convention on Climate Change (UNFCCC) to sign a legally binding deal. The Bali action plan in the year 2007 laid a roadmap for the post-Kyoto Protocol agreement for developed countries (Annexure 1 parties in the convention) to reduce greenhouse gases (GHG) emission and assist developing countries to adapt climate change. The developed countries also agreed to help developing countries by transferring their technology to make them to adopt low carbon emission path way. The Bali climate convention has agreed two track negotiations: 1. “working group for long-term cooperative action”, 2. “working group on Kyoto protocol”.

IPCC set the targets for the Copenhagen negotiations. According to them, the GHG emissions will increase enormously by 2015 and then decline by 25-40% over 1990 level by 2020 and will reduce by 80 % over 1990 by 2050 to stabilize carbon dioxide concentration at 450ppm to limit the global warming below 2⁰C (IPCC 2007). The analysis of World Resource institute shows that the commitments announced so far by rich countries may add up to only 13-19 % emission reduction whereas according to IPCC, 25-40 % reduction is needed (Levin and Bradley, 2009). According to the study by International Energy Agency, limiting global warming to 2⁰C with the carbon dioxide concentration limited to 450ppm is feasible, only if the world is ready to invest in low carbon technologies. The key issues discussed at Copenhagen summit are as follows:

- Making continuous progress in the negotiations of Kyoto protocol.
- Insisting governments to commit mid-term GHG emissions reduction.
- Developing scientific monitoring, reporting and verification methods.
- Funding for adaptation and mitigation.
- Transferring technology to the developing countries.

According to the assessment, even if the carbon dioxide concentration is stabilized at 450 ppm which seems highly unlikely there is 26-78 % of risk of overshooting the 2°C goal (Meinshausen, 2005). The Copenhagen summit has taken into consideration of scientific communities' view on restricting global warming below 2°C. After the debates and the intervention of Island countries and Least Developed Countries, the summit included 1.5°C as a target for future negotiations and considerations. This Copenhagen summit also recognized the need to cooperate in achieving halting of the global and national emissions as soon as possible by keeping the special circumstances of developing countries and the need for economic development and poverty alleviation (Ravindranath, 2010).

Copenhagen green fund was established to support mitigation, adaptation, technology transfer and reducing emissions from deforestation. The accord also agreed to transfer technology by establishing a mechanism to do the same. The developed countries agreed to provide US\$ 30 billion immediately for the period of 2010-2012 and mobilize US\$ 100 billion per year for the developing countries.

16.5.1 India and Copenhagen Summit

The Indian delegations in the Copenhagen Summit have expressed the positive outcome because it does not set the time limit for reducing the GHG emissions. India has to increase fossil fuel-based energy to promote the economic growth. The assumption is that if it increases the fossil fuel energy, it automatically reduces the poverty.

India's expectation from Copenhagen Summit is as follows:

- International cooperation should be there to combat climate change.
- The outcome of the negotiations in the Copenhagen should be fair and equitable. It must be in accordance with the "principle of common but differentiated responsibilities and respective capabilities" as per 1992 Rio declaration.
- Summit should provide a space to accelerate socio-economic development in order to eradicate poverty through ecologically sustainable manner.

16.5.2 India's Position

- 1) India, as a sovereign State totally rejected any form of surveillance or

supervision by international organisations in relation to CO₂ emission reduction within the state, especially to the extent that:

- It did not want financial support from international agencies or organization. It was ready to manage from domestic resources.
 - It was ready to take its own procedure for reduction of CO₂ emissions and the percentage reduction will remain at the discretion of the country.
- 2) The Copenhagen Conference is not a legally binding text. The Copenhagen Conference is only a procedure for improving the existing institutional framework to combat climate change and is not under any circumstances a re-negotiation of it nor can it result in the development of a new framework.
 - 3) The Kyoto Protocol remains the core, adequately binding text at international level, and consequently it was not considered necessary to prepare a new text. The only subject for debate is determination of new restrictions on the quantity of CO₂ emissions for developed countries and the setting of a new time period for achieving those targets after 2010.
 - 4) As mentioned earlier, the developed economies are responsible for the phenomenon of underdevelopment in the global system. As a consequence, it is for certain that the responsibility of the developed countries to actively support sustainable development in developing countries by transferring economic resources and technology without enforcing conditions of any sort, such as patents or copyright. The parties responsible for the underdevelopment cannot set conditions.
 - 5) It is unfair to impose emission norms to all industries at global level on issues relating to sectoral emission reduction policies. In other words, the types of industries which cause the greatest harm by emitting large quantities of CO₂ must be identified and focus should be given only on those industries.

It may be stated that the “Accord is meant to facilitate the ongoing negotiations in the two tracks in accordance with the principles and provisions of the UNFCCC, the Kyoto Protocol and the Bali Action Plan. The Accord was not adopted by the Conference of Parties but just taken note of. However, the Accord could have value if the areas of convergence reflected in the Accord are used to help the Parties reach agreed outcomes under the UN multilateral negotiations in the two tracks, i.e., the Ad-hoc Working Group on Long Term Cooperative Action and the Ad-hoc Working Group on Kyoto Protocol. The Accord is only an input into the two-track negotiations. The Accord is not /a new track of negotiations or a template for outcomes.”(www.usclimatenetwork.org/policy/copenhagen-accord-commitments#note10).

16.5.3 Impact of India's Position on the Copenhagen Summit

- 1) India has emerged as regional leader in the SAARC region by strengthening its economy.
- 2) Development of basic block in the conference is the result of India's aspiration as a regional leader to foster ad hoc partnership.
- 3) It has strengthened its relationship with China.
- 4) The closer ties of India and China on climate change issues are expected to bring multiple impact at the international level.
- 5) India strengthened its position by mobilizing more developing countries to adopt joint position and shape the final conference text. So, the text was not binding. It acted as a powerful member for the economically developing force.
- 6) The role played by the G77 was worth to be noted and India being part of G77 group had a significant influence.
- 7) The conference proceedings showed that the developed countries have split into many and least developed countries took different positions. The island nations had a different position. This affected the outcome of the conference proceedings and the conference could not take specific time frame for implementing the climate change.

Check Your Progress 1

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

- 1) What are the issues discussed at Copenhagen Summit?

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- 2) List out the expectations of India from Copenhagen Summit.

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16.6 PARIS AGREEMENT

At the Durban Conference (COP 17) an “Ad-Hoc Working Group on the Durban Platform for Enhanced Action” was established “to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties”, by COP 21 so that it can be adopted no later than 2015. The Paris Agreement is the outcome of four-year negotiating process and multilateral diplomacy. Article 2 of the Paris Agreement, states that “in enhancing the implementation of the Convention, including its objective, the agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”. Paris Agreement entered into force on 4th November, 2016. The main features of the agreement are universal application; the principle of equity and principle of common but differentiated responsibilities and respective capabilities; and “legally binding agreement that will apply to those states that have expressed their consent to be bound by means of ratification, acceptance, approval, or accession”. With respect to our country, the agreement demands India to submit “national contributions” every five years; and to embark on low carbon development pathway.

The successful multilateral diplomacy has brought a historic Paris Agreement to address climate change. The Paris Agreement binds all States that have expressed their consent to be bound by this agreement. Once they accept and approve, they ratify the same and take necessary measures to implement the same by formulating laws, policies and programmes. Any legal character of a provision in the international treaties makes the parties to oblige legally. It also set the standards for States to achieve the obligations within prescribed time period. States need to assess their work in a regular interval and submit reports periodically. This may give clear picture whether states have compliance/non-compliance to the agreed provisions. If we assess Paris Agreement through these lenses, states need to fully oblige mitigation and transparency sections of the Agreement. Unlike mitigation and transparency sections, adaptation sections seem to be soft obligations.

175 countries including India ratified Paris Agreement. As we mentioned earlier, unlike the divisive Kyoto Protocol, all parties required to submit relevant documents with regard to GHG mitigation and adaptation measures to counter adverse effects of climate change as per Paris Agreement at

regular intervals. 189 states/countries covering over 95% of global emissions have submitted nationally determined contributions in the context of Paris Agreement. The Paris Agreement has aspired to address adverse effects of climate change by stabilizing temperature rise ('well below 2°C' and to aspire to 1.5°C). As we mentioned earlier, each state/country must report to their efforts to combat GHG emissions or mitigation measures in every five years.

Agreement provides autonomy to the states/countries to decide on their own to address climate change. But their successive efforts must be progressive one compared to previous ones. There are three important components in the Paris agreement. Firstly, states/countries must take transparent measures to address or mitigate climate change and their agreed contribution. Secondly, there will be global stock taking process which will be assessed periodically to recognize collective progress towards the Agreement's long-term goals. Thirdly, there will be a compliance system that facilitates member states/countries. It was recognized by the previous studies that the measures taken to mitigate and adapt to climate change might affect human rights. First of its kind, Paris Agreement accepted the relationship between climate change and human rights like right to life, right to health, right to food, and right to housing, with marked departure from earlier climate change instruments. It contained explicit reference. In addition to this, states/countries need to formulate necessary laws to improve socio-economic conditions of vulnerable to address human rights issues. Yet, until recently, no legally binding international climate instrument explicitly recognised the existence of intersections between human rights concerns and climate change.

As far as India is concerned, the Paris Agreement requires India to submit its national contribution every five years, ensuring that each contribution is a progression on the previous one. It also requires India to report periodically on its actions to achieve and implement its contribution. In addition, India should 'strive' to submit long-term low-GHG development strategies within which these national contributions will sit. The Paris Agreement makes India to formulate necessary policies to address energy requirements, environment and development. As mentioned earlier, each member states need to submit periodically about their progress. To do the same, India must collect quantitative data rigorously to show the progress. Qualitative data may be helpful to recognize the impact of policies on vulnerable. Although, India was able to reduce poverty among vulnerable considerably over plan period, it needed to take further measures to address poverty and vulnerability in certain geographical areas. The measure taken at this issue must be in a right direction. India has responsibility at the international level too. With regard to reducing GHG emissions to bring temperature at certain levels, countries must share burden equitably. Countries like India must give voice in this direction.

16.7 INDIA'S RESPONSE FRAMEWORK

India is one of the fastest-growing economies of the world with deficient energy sources to meet the growing economy. India has more than one billion population. Out of them, 800 million people (79.9 per cent of the population) live on less than the US \$ 2 per day. More than 700 million people cook on traditional cookstoves using crop waste and animal residue. More than 400 million people do not have access to electricity. India stands at 128th position in the World Human Development Index. Further, the rural population is more vulnerable to climate variability as they have low adaptive capacity concerning extreme and fluctuating weather condition. The IPCC assessment report reveals the following:

- Increase in rainfall over the Indian sub-continent by 6-8 per cent.
- Extreme rise of maximum and minimum temperature is expected in the West Coast of India and West Central India.
- Heat spell has become common in Northern India.
- There were around 15 significant droughts in the past 50 years, which affected the productivity of rain-fed crops in drought years.
- Food security is under threat due to the occurrence of drought and flood, and variability in the climate.

The adverse impact of climate change has already threatened the existing livelihood in India, for which India has undertaken various sectoral mitigation measures to contribute towards the objectives of United Nations Framework Convention on Climate Change (UNFCCC). India's development plan is based on the primary principle of sustainability, along with inclusive economic growth. There have been initiatives taken in sectors like coal and oil, renewable energy, hydropower, social energy, energy efficiency and conservation, transport, agriculture, power sector, and so on. The broad areas where the adaptation measures have been carried out include:

- Crop Improvement
- Drought Proofing
- Health
- Risk financing
- Disasters management
- Livelihood Preservation

16.8 NATIONAL ACTION PLAN ON CLIMATE CHANGE

National Action Plan for Climate Change (NAPCC) was formulated and released on 30th June, 2008. The guiding principles for NAPCC are given below:

- Formulation of inclusive, climate change policies by protecting the rights of the poor and vulnerable;
- Achieving national growth objectives by taking measures in a definite direction that must address ecological sustainability which further address greenhouse gas mitigation;
- Devising efficient and cost-effective strategies for end use demand side management;
- Developing and deploying appropriate technologies for both adaptation and mitigation of greenhouse gases emission extensively at an accelerated pace;
- Encouraging all stakeholders to develop a new and innovative forms of market, regulatory and voluntary mechanisms to promote sustainable development;
- Ensuring effective implementation of programme through unique linkages, including with civil societies and local government institutions and through public-private partnership;
- Encouraging international cooperation for research, development, sharing and transfer of technologies enabled by additional funding and a global IPR regime that facilitates technology transfer to developing countries under UNFCCC.

Based on the above-mentioned guiding principles, the Government of India has developed eight National Missions.

- 1) National Solar Mission (NSM);
- 2) National Mission for Enhanced Energy Efficiency (NMEEE);
- 3) National Mission on Sustainable Habitat (MNSH);
- 4) National Water Mission (NWM);
- 5) National Mission for Sustaining the Himalayan Ecosystem (NMSHE);
- 6) National Mission for a Green India (GIM);
- 7) National Mission for Sustainable Agriculture (NMSA); and
- 8) National Mission on Strategic knowledge for Climate Change (NMSKCC).

These missions will be implemented through different ministries based on their subject matter. Apart from ministries assigned to the task, Ministry of Finance, Planning Commission, experts from industry, academics and civil society will be part of the mission. The institutional structure depends upon task allocated for particular mission. Each ministry implements the mission by formulating necessary policies and programmes and develop detailed mission document which will be placed in the individual ministry website. We will discuss mission goals, strengths and weaknesses.

National Solar Mission

Mission has ambitiously targeted to generate considerable percentage of solar power by each state in India individually and country as a whole. The Mission's Renewable Purchase Obligations (RPOs) and auction process has brought fair degree of transparency and accountability to the process. According to the reports, the mission could able to achieve a substantial amount of work in the Phase I. The Mission has failed to recognize the potential off-grid generation which might helpful for poor and vulnerable. India is implementing various sustainable development programmes from first five-year plan period onwards. The success of solar water heater scheme of Ministry of Non-Conventional and Renewable Energy in 1990s in the State of Karnataka and Maharashtra might be notable example for emulation.

- The National Solar Mission aims at generating 20,000 MW of solar power by 2022.
- The Mission also has other targets: 2000 MW of off-grid solar plants, and 20 million square meters of solar collectors to be installed. In addition, 20 million solar lighting systems will be created/distributed in rural areas, saving about 1 billion litres of Kerosene every year.

National Mission for Enhanced Energy Efficiency (NMEEE)

The mission has introduced innovative measures like Perform, Achieve and Trade (PAT), Super-Efficient Equipment Programme (SEEP), and Market Transformation for Energy Efficiency (MTEE). The mission has made available necessary funds to achieve targets like Partial Risk Guarantee Fund (PRGF) and Venture Capital Fund for Energy Efficiency (VCFEE). The mission target was not holistic rather it targets only sub-sectors. It concentrates only on large scale industries.

National Mission on Sustainable Habitat (MNSH)

Mission plan was integrated with already existing plan Jawaharlal Nehru Urban Renewal Mission and tried to bring smart cities with energy efficient components. Mission must integrate their ideas by using bottom-up approach to the planning and all its planning should be from stakeholders' perspective.

National Water Mission (NWM)

Mission affirms to bring comprehensive data base on the existing water sources. Study must be conducted on the relationship between water and climate change. Identifying existing water sources and restoring and rejuvenating with the help of communities are significant.

National Mission for Sustaining the Himalayan Ecosystem (NMSHE)

The mission aims to evolve policy and management strategies for protecting and sustaining the Himalayan Mountain ecosystem including Himalayan glaciers. Further, it aims to establish "an observational and monitoring

network” to assess the resources and ecosystem health of Himalayan ecosystem. The mission recognises the importance of the Himalayas in sustaining large number of people and serves as an opportunity to promote a mountain-driven rather than plains-driven approach. Poor and vulnerable people are directly affected by the deforestation, depletion of natural resources and the construction of dams.

National Mission for a Green India (GIM)

The overarching target of the GIM is to double the area to be taken up for afforestation/eco-restoration in India in the next 10 years, taking the total area to be afforested or eco-restored to 20 million ha. This would increase the above and below ground biomass in 10 million ha of forests/ecosystems, resulting in increased carbon sequestration of 43 million tons CO₂e annually. Mission has ambitious plan to regulate and institutionalize local community level institutions. Mission will identify best practices and same will be used as learning sites.

Key features of GIM include:

- Increasing the quality of our forest cover by increasing the cover and density of our medium density and degraded forests.
- Taking a holistic view of forestry, and not merely focus on plantations to meet carbon sequestration targets.
- Focusing on decentralization and involving existing local governance institutions. Forests are the main source of livelihood to over 200 million people in India and hence GIM will actively try to secure the participation of local communities.

National Mission for Sustainable Agriculture (NMSA)

Mission understood the problems faced by country especially agriculture sector with regard to climate change. But mission failed to understand the problems of marginal and small farmers. Identifying and scaling up of agriculture based on agro-climatic zone is important. The mission fails to address fuel and fertiliser shortages. In the era of post-globalization and mechanization of agriculture, the sector altogether faces different kinds of problem.

National Mission on Strategic Knowledge for Climate Change (NMSKCC)

It is significant to encourage all stakeholders to do research on long-term consequences of climate change. Knowledge gap and the impact of socio-economic changes must be identified through research.

Check Your Progress 2

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

1) What is GIM? Explain its key features.

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2) What are the eight missions under National Action Plan on Climate Change (NAPCC)?

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16.9 STATE GOVERNMENTS' EFFORTS TO ADDRESS CLIMATE CHANGE: STATE ACTION PLAN

The central government formulated NAPCC and requested all State governments to formulate State Action plan on Climate change (SAPCC). In 2009, the Government of India notified state governments to come up with their own climate change policies related to mitigation and adaptation. The plans and actions should be aligned with their respective state priorities as well as the NAPCC goals. Hence, the State Action Plan on Climate Change (SAPCC) in India is the most notable policy reflecting the nature of decentralized climate change mitigation framework of the country.

The State governments need to take following steps before implementing “State Action Plan on Climate Change”. It required to seek prior approval from the Ministry of Environment, Forest and Climate Change (MoEFCC) before implementation of activities listed therein. For implementation of SAPCCs, a combined budgetary requirement of INR 11.32 lakh crores (USD 188.66 billion) has been received by the ministry (MoEFCC, 2014). Ministry will scrutinize the proposal and disburse the required amount as per needs of the State governments. However, States may receive all necessary help from the centre to implement their plans to achieve national targets and priorities related to climate change.

India has vast geographical area having varied agro-climatic conditions. It is important to formulate policies by considering all these factors. Central government broadly frame the policies and state and local governments make necessary changes in the same to suit their local conditions and implement the same within the decentralized framework of mitigation strategies. India as mentioned earlier is a federal State and always involves every level of governance structure for a critical policy intervention. Delivery of services and implementation will be effective only if all are involved in it. With regard to climate change policy, disaggregated climate data clearly indicates that the vulnerabilities and opportunities will be well understood at the state and local level than at the country level. Through states, national policies reach to a large number of sectors and actors effectively while addressing state priorities at the same time. In addition, measurement and monitoring at the state level can be taken up more efficiently. For this reason, many of the national policies in India are implemented through the states. Some other standalone programmes like renewable purchase obligations, implementation of feed-in-tariffs, setting up of state energy conservation funds, implementation of small and hybrid hydroelectric systems and energy conservation building codes are some of the examples of policies that are implemented through the states. Almost all of these now come together within the larger umbrella of the state action plans.

It is significant for the learners to remember the following points related to policies.

- The Ministry of Environment, Forest and Climate Change requested all Indian States to develop action plans by defining their activities and programmes to be undertaken with the aim of adaptation and mitigation in consonance with the objectives of NAPCC.
- The objectives of the NAPCC were to ensure sustainable development in the country. It will provide guidance to formulate necessary policies in a sustainable manner in future. This can be achieved only through the active support of State and local governments. Hence, the Government of India has encouraged the State Governments to develop State Action Plan on Climate Change (SAPCC).
- SAPCCs would address the need of the country as well as provide direction to achieve the same. It would help identify measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively.
- It wants to advance India's development and climate change-related objectives of adaptation and mitigation.
- GIZ and other organizations such as the United Nations Development Programme (UNDP), UK Department for International development and The World Bank are providing technical assistance to the interested Indian States in the development of SAPCC.

- The State-level plans are not only important for implementation of the NAPCC, but also inclusion of particular regional and local characteristics and specific concerns of vulnerable sectors and communities within each State. Let's now see few examples.

16.9.1 Tamil Nadu

The State of Tamil Nadu in order to further their proactive measures against climate change; and in response to National Action Plan on Climate Change (NAPCC), established the Tamil Nadu State Climate Change Cell (TNSCCC). It has also established web portal to disseminate information. The cell has visualized for building the capacity of all the stakeholders to respond climate change with various measures. It has a vision to make the state resilient. It has planned to collect necessary data and analyse the same to disseminate scientific information among farmers', fishermen, general public, policy planners', decisions makers', bureaucrats' and others. The important scientific contribution to address climate change was the development of "ClimaRice". "ClimaRice" is indeed an "Intercontinental collaborative project" entitled "Climate Change and persistent Droughts: Impact, vulnerability and adaptation in rice growing sub-divisions in India". Through this project, climate change impacts on Cauvery Basin of Tamil Nadu, which is drought prone have been investigated both in the current and projected climate scenarios. Eventually, a series of adaptation measures have been developed with an aim of sustaining the production in the Cauvery Basin.

The strategies suggested as part of the project to address climate change in the Cauvery basin are:

- Creating awareness among farmers' and other stakeholders to do minimum tillage to retain soil carbon content;
- Strategies to develop and promote the "use of drought and flood tolerant varieties";
- Promoting the crop rotation practices that augment soil productivity;
- Short duration pulse crops are recommended as relay crop, which would enrich the soil with nitrogen, improve soil fertility, and reduce dependence on the chemical fertilizers and pesticides;
- Encouraging the use of quality inputs like quality seeds, and market intelligence;
- Encouraging the farmers to grow green manure crops, and use biofertilizers;
- Introduction of modified cultivation methods such as "System of Rice Intensification"; and
- Promotion of crop residue retention on soil to build up soil biomass.

The broad strategies for climate change adaptation in agriculture and horticulture sector in Tamil Nadu are given in the box 16.1.

Box 16.1: Broad strategies for climate change adaptation in agriculture and horticulture sectors in Tamil Nadu

- Sowing is recommended to be in consonance with the onset of South-west and North- east monsoons;
- Soil erosion must be managed through measures such as minimum tillage, mulching, etc.;
- Soil health and soil nutrient content may be improved through soil-test based Integrated Nutrient Management;
- Promotion of Integrated Pest and Disease Management;
- Water-use efficiency can be improved through methods such as drip, sprinkler irrigation, etc.;
- System of Rice Intensification (SRI) can double or triple current rice yields;
- Emphasis must be on to develop and introduce new crop varieties that are tolerant to high temperature and water stress;
- “Crop Diversification” is recommended to augment the livelihoods;
- Integrated Farming System is recommended to utilize the farm resources efficiently.
- Risk Mitigation Measures such as compulsory crop insurance are recommended to compensate for the crop losses due to extreme weather events;
- Supply of quality agricultural inputs;
- Capacity building on latest agricultural technologies;
- “Rain water management practices at household and landscape level”;
- “Institute a long-term rice varietal development program to make available new rice varieties and conserving local gene pool through public-private partnership, and actively engaging local farmers, women, and other local agencies in the process”.
- “Help farmers adopt tailored farming practices including soil nutrient management, choice of crop and cultivars, and pests and disease management as per the suitability/potential of different agro-climatic zones based on weather-based advisories derived from climate analysis of the local area and forecasting which includes probable occurrence of pests and disease”.

- “Support research on weather-based crop insurance schemes to cover risks of increasing intensities and frequencies of extreme weather events. The challenge is to develop a weather-based index to simplify the insurance claims and payment procedures”.

Reference: <http://www.environment.tn.gov.in/doc/TNSAPCC%20PDF/Chapter%205%20Sustainable%20Agriculture%20.pdf> ; Government of Tamil Nadu. 2013. State Action Plan on Climate Change. Chennai: Government of Tamil Nadu.

16.9.2 Delhi

Cities in India are expected to grow with approximately additional 500 million populations. In this transition, governments at all levels especially city government need to equip themselves to address the needs of population in the areas of physical infrastructure, social infrastructure, housing, water, public transportation, health, education, sewage system and solid waste management. Cities, especially mega cities in India with high concentration of population are at risk from the impact of climate and related issues.

Delhi, the capital of India, with geographical area of 1483 square km with high air pollution has developed specific agenda to address and combat climate change. Delhi face threat from climate change and related issues on infrastructure, human lives, human health, personal property, environmental quality and future prosperity. Delhi has introduced a Delhi Climate Change Agenda (2009–2012) by incorporating actions to address the issues raised in the Prime Minister’s National Action Plan on Climate Change. Delhi Government’s agenda aims to reduce Delhi’s carbon footprint by identifying 65 set of action points. These actions will be addressed by taking appropriate measures at the policy level by the various departments of Delhi government. For example, the government of Delhi introduced compressed natural gas (CNG) fuelled buses for public transport by replacing existing diesel fuelled buses. Delhi government with the help of central government implemented Jawaharlal Nehru Urban Renewal Mission (JNURM) in 2005 itself to address issues related to urban development. But these schemes should be integrated with climate adaptation, mitigation and climate change related risk management.

Delhi cabinet has decided to upgrade energy efficiency of existing government buildings through retrofitting which are to be carried out by energy service companies in a performance contracting mode. The objective is to ensure that the government buildings can achieve at least rating of one star from BEE under their office building labelling programme. Delhi government is also considering the installation of energy efficient water and wastewater treatment operations and methane recovery and reuse for a CDM project.

16.9.3 JHARKHAND

Jharkhand has area coverage of 79,714 square km. Jharkhand has 24 administrative districts. Ranchi is the state capital as well as an industrial city. It has rich physiographic characteristics. The rivers Swarnrekha, Koyal, Shankh and Damodar flow through the State and are utilized for irrigation in many places in the State. Jharkhand has around 40 per cent of the country's mineral resources such as coal, iron ore, copper, uranium, mica, bauxite, granite, limestone, silver, graphite, magnetite and dolomite. It possesses about 40 per cent of the country's mineral wealth. 11 per cent to the State's GSDP comes from mining and quarrying activities. The State mineral reserves include coal, iron ore, bauxite, copper, mica, graphite, manganese, lead, silver, uranium and limestone. The State exports minerals to Bangladesh, Nepal, South Africa and Saudi Arabia. As regards the measures with respect to climate change mitigation, the state has proposed a scheme called Jharkhand Solar Policy (2015).

Jharkhand Solar Policy 2015

The objective of the scheme is to encourage participation of private sector to set up solar power-based projects in the State and increase solar power generation to 2500 MW by the year 2020 in a phased manner.

The Jharkhand Renewable Energy Development Agency (JREDA) was incorporated as a society in the year 2001 for promoting use of renewable energy sources in the state. Being a nodal agency, JREDA is working for implementation of fiscal and financial incentives made available by the Ministry of New and Renewable Energy Sources (MNRES), Govt. of India and Indian Renewable Energy Development Agency (IREDA).

16.10 ASSESSMENT OF STATE ACTION PLANS ON CLIMATE CHANGE

This section broadly assesses the existing State Action Plans to address climate change. India has to prepare detailed nation-wide project for 15 agro-climatic zones with varying vulnerabilities. By considering the vastness and varying agro-climatic zones, central government made all States to participate actively to address climate change by assessing their own vulnerabilities. It needs to prepare detailed plan document on par with NAPCC. It needs to identify projects and prepare budgeting and monitoring mechanisms. State governments have freedom to involve local self-governments to implement projects related to climate change. This exercise was considered as one of the biggest in the world. The State Action Committees submitted 32 plan proposals to the Union Ministry of Environment, Forest and Climate Change (MoEF&CC). The Common framework document for SAPCCs circulated by MoEF&CC requires States to assess "the physical and economic impact of and vulnerability to climate change on the most vulnerable sectors and vulnerable groups". This is very

important to plan, adopt and implement mitigation strategies. For example, States like Tamil Nadu, Gujarat, Maharashtra, Karnataka, Orissa, West Bengal and Andhra Pradesh have long coast lines. These States are vulnerable to frequent cyclone and flood. Fishermen and cities close to coastal areas get affected by the unexpected monsoons. It is necessary for these states to assess vulnerability of fishermen and others who are directly depended on sea for their livelihoods. The analysis of Centre for Science and Environment (CSE) shows that “the SAPCCs submitted by most states lack detailed vulnerability assessments. Some are so broad and general that they risk overlooking specific local issues, while others like Gujarat, Odisha and Tamil Nadu have assessed their vulnerability based on a few projects. SAPCCs of Mizoram and Uttarakhand do not even mention vulnerability assessment”. According to the report prepared by CSE, the Uttarakhand State has conducted several consultations among civil society groups and academics to recognize the severity of climate vulnerabilities. The result of the consultation was missing in the report. Punjab conducted stakeholder consultation for preparing its SAPCC. Mizoram neither held consultations with civil society nor vulnerable communities. Some have adopted international and national level models and used the same to assess and prepare vulnerabilities. But these models have their own limitations with respect to projects, region or State specific changes and vulnerabilities. India’s climate system is monsoon driven. States must plan adaptation and mitigation strategies according to climate change projection scenarios. According to CSE analysis, “Mizoram and Odisha lack climate projections in their SAPCCs, while others, including Gujarat, rely on climate models used by the UK. Madhya Pradesh made mid-century and end-century projections based on secondary data collected from various sources. CSE researchers found that the states are depending on secondary sources due to lack of domestic climate models. The outcomes of such projections based on flawed models have a degree of uncertainty as climate change impact is highly local in nature” (Down to Earth, 2018).

The next comes finance. The States have no clarity about financing. It has assumption that the central government or international organization would provide required finance to implement their projects. States like Madhya Pradesh demanded Rupees 4,700 crores, while Tamil Nadu demanded more than Rupees 400,000 crores. Gujarat allocated around 80 per cent to the water sector. Most states do not depict the true picture of their vulnerability in the SAPCC document and the required steps that need to be taken to enhance their adaptive capacity and reduce their vulnerability to climate change extremes. The documents lack mentioning the effective monitoring and evaluation institutions for the project implemented to address climate change. States such as Kerala and Uttarakhand, are in the process of revising their SAPCCs to meet their domestic and international objectives after recognising the inadequacy in the existing document. “The state of Mizoram has initiated a ninth mission on health, in addition to the eight national-level missions for

climate change. The state government is of the opinion that health is one of the major climate change impacts and hence has included it as an additional mission. The National Adaptation Fund for Climate Change (NAFCC) is funding a project to augment livelihood of rural communities by building resilience in agriculture. The project is being implemented by the state agriculture department and is currently in its third year” (Down to Earth, 2018).

Check Your Progress 3

Note: i) Use the space given below for your answers.

ii) Check your answers with those given at the end of the unit.

- 1) Write short note on the policies of the State of Tamil Nadu to mitigate climate change.

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- 2) What is State Action Plan on Climate Change?

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16.11 LET US SUM UP

The climate change is the biggest threat in the 21st century. The international scientific community urged the world to stabilize the level of emissions in the atmosphere in order to avoid future potential impact. In doing so, the countries have proposed several international summits to discuss climate change and to find solution to the problems of climate change. This process is started in the year 1988 in Toronto as a World Conference on Changing Atmosphere. The conference recommends reducing carbon dioxide emission by 20 %. In the same year Intergovernmental Panel on Climate Change (IPCC) met in Geneva and assessed the state of scientific knowledge on climate change, evaluated its impact and brought realistic solution. The first IPCC report was published in the year 1990. All these events led to the world community to conduct series of climate conferences. Further, we have studied about Kyoto Protocol and Paris Agreement on Climate Change.

Through this unit, we have discussed that India has taken a firm and reasonable stand towards climate change negotiations. The State Action Plan on Climate Change (SAPCC) and its impact too discussed in the unit.

16.12 KEY WORDS

International Organization: Organization which presents at international level with scope of dealing issues among nations.

Niti Aayog: It is a premier think tank of Government of India to provide critical knowledge for policy formulation.

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16.14 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) The key issues discussed at Copenhagen summit are as follows:

- Continuing negotiations of Kyoto protocol.
- Making governments to commit midterm GHG emissions reduction.
- Developing, monitoring, reporting and verification methods.
- Funding for adaptation and mitigation.
- Transferring technology to the developing countries.

2) India's expectation from Copenhagen summit

- International cooperation should be there to combat climate change.
- The outcome of the negotiations in the Copenhagen should be fair and equitable. It must be in accordance with the principle of common but differentiated responsibilities and respective capabilities as per 1992 Rio declaration.
- Summit should provide a space to accelerate socio-economic development in order to eradicate poverty through ecologically sustainable manner.

Check Your Progress 2

1) GIM means Green India Mission. Key features of GIM include:

- Increasing the quality of our forest cover by increasing the cover and density of our medium density and degraded forests.
- Taking a holistic view of forestry, and not merely focus on plantations to meet carbon sequestration targets.
- Focusing on decentralization and involving existing local governance institutions. Forests are the main source of livelihood to over 200 million people in India and hence GIM will actively try to secure the participation of local communities.

2) The eight National Missions under National Action Plan on Climate Change are as follows:

- National Solar Mission (NSM);
- National Mission for Enhanced Energy Efficiency (NMEEE);
- National Mission on Sustainable Habitat (MNSH);
- National Water Mission (NWM);
- National Mission for Sustaining the Himalayan Ecosystem (NMSHE);
- National Mission for a Green India (GIM);
- National Mission for Sustainable Agriculture (NMSA); and
- National mission on Strategic Knowledge for Climate Change (NMSKCC).

Check Your Progress 3

1) The State of Tamil Nadu in order to further their proactive measures against climate change; and in response to National Action Plan on Climate Change (NAPCC), established the Tamil Nadu State Climate Change Cell (TNSCCC). It has also established web portal to disseminate information. The cell has visualized for building the capacity of all the stakeholders to respond climate change with various measures. It has planned to collect necessary data and analyse the same to disseminate scientific information among farmers', fishermen, general

public, policy planners', decisions makers', bureaucrats' and others. The important scientific contribution to address climate change was the development of "ClimaRice". "ClimaRice" is indeed an "Intercontinental collaborative project" entitled "Climate Change and persistent Droughts: Impact, vulnerability and adaptation in rice growing sub-divisions in India". Through this project, climate change impacts on Cauvery Basin of Tamil Nadu, which is drought prone have been investigated both in the current and projected climate scenarios. A series of adaptation measures have been developed with an aim of sustaining the production in the Cauvery Basin.

- 2) Government of India formulated NAPCC and requested all State governments to formulate State Action plan on Climate change (SAPCC). In 2009, the Government of India notified state governments to come up with their own climate change policies related to mitigation and adaptation. The plans and actions should be aligned with their respective state priorities as well as the NAPCC goals. The State Action Plan on Climate Change (SAPCC) in India is the most notable policy reflecting the nature of decentralized climate change mitigation framework of the country. SAPCCs would address the need of the country as well as provide direction to achieve the climate change mitigation and adaptation.