

Environmental Impact Assessment
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Lecture – 20

EIA – Law, Policy, and Institutional Arrangements for EIA Systems
(Part-VIII) Ecosystem Services

Welcome to the course Environmental Impact Assessments. In our first week of lectures, we looked at the global environmental status and we looked at biodiversity; and then we also looked at the land and soil. In all of these, we did come across the concept of ecosystem services. So, we are going to now look into what are the legal legislations which, at the international level, and national level, are available for the purpose; and in which context we work. So you might recollect how we see these things as ecosystems.

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How did we identify the different kinds of ecosystems from provisioning services to regulating services, supporting services, and cultural services? So we had seen all this, you may recollect. And today we are going to look at the legislation part of it, the policy and guidelines in this area. So, we highlighted the global decline in the extent of what is happening conditions, and functionality of ecosystems, and their capacity to provide services; like how they really, what kind of services they provide.

And, then we also looked at what kind of change is happening in that; and what are these consequences, what serious consequences we are going to face; because of the decline in the ecosystem services. So, we also looked at various drivers of change through the report, that we were studying. So in this particular lecture, we will develop a further understanding of law, policy, and institutional arrangement for ecosystem services. So accordingly, our coverage will include.

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Coverage	
1	Background on Ecosystem Services
2	International agreements and policy objectives
3	National Ecosystem Services Policy: Indian Context
4	Examples of Initiatives Related to Ecosystem Services in India
5	International Examples of ecosystem services policy, legislation
6	International Finance Institutions
7	Guidance on Integrating Ecosystem Services in ESIA

Now, we will look at the context of the ecosystem services. And then we will look at the international agreements and policy objectives; we will also look at the National Ecosystem Services Policy in the Indian context. Then, will also look at the examples of initiatives related to ecosystem services in India.

Thereafter, we will look at the international examples of how things have been taken care of. And then we will also look at, like, what requirements are laid by the international finance institutions for ecosystem purposes. Lastly, we will look at guidance on how to integrate all these ecosystem services, the requirements, and the understanding into the EIA process.

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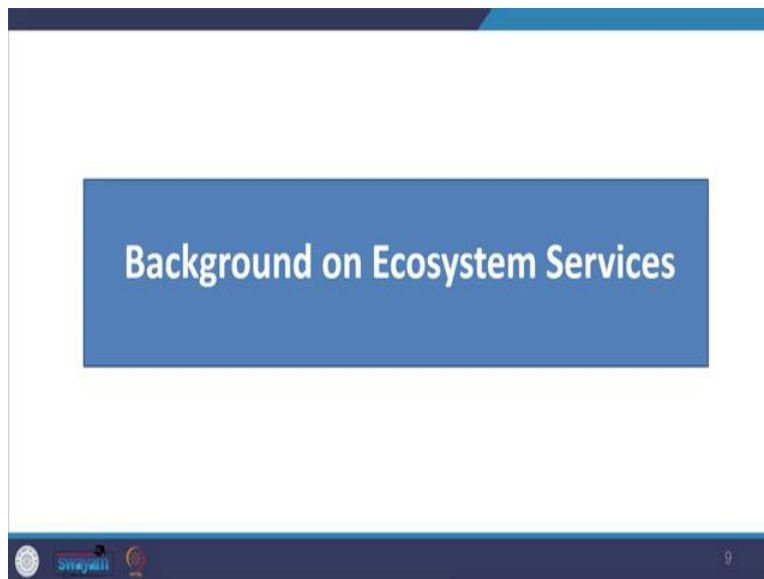
Learning Outcomes	
1	Contextualize of Ecosystem Services
2	International Agreements and Policy Objectives
3	National Ecosystem Services Policy: Indian Context
4	Examples of Initiatives Related to Ecosystem Services in India
5	International Examples of ecosystem services policy, legislation
6	International Finance Institutions
7	Guidance on Integrating Ecosystem Services in ESIA

The learning outcomes, which are expected from you after completion of this session include that you should be able to contextualize the ecosystem services in the policy framework. Further, you should be able to identify and relate international agreements and policy objectives; and then also see how they translate to international-level legislation or the regional level legislation. You should be able to identify various national ecosystem

services policies from the Indian context. Further, you should be able to quote or discuss some of the examples of the initiatives related to ecosystem services; and then you should also be able to relate some of the international examples.

Further, you should be able to identify International Finance Institutions; and what kind of tools they use for making people abide by, or to undertake ecosystem services assessment. Further, you should be able to identify, what kind of guidance is available to integrate ecosystem services into the EIA system.

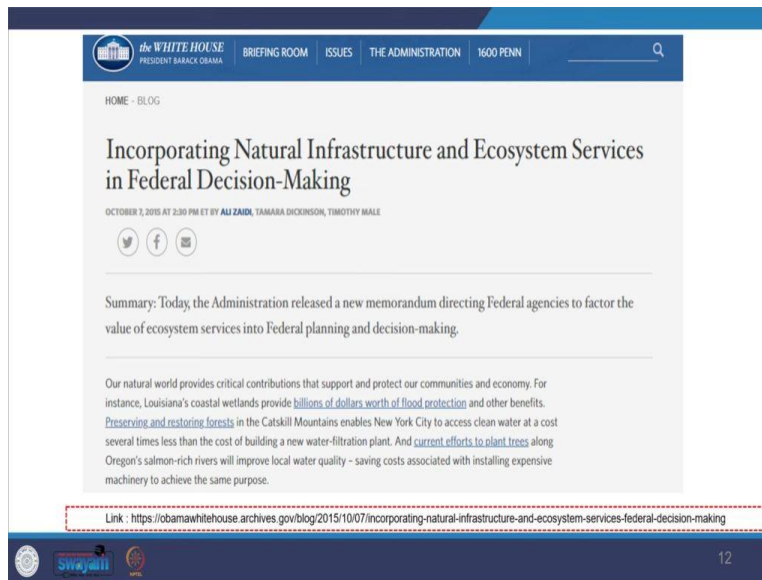
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So, now looking at the background of ecosystem services, we see that there is an increase in considerations and concerns for ecosystem services; and it is becoming very common now. So generally, most of the government policies or the development work are encouraged to be within the environmental limits.

So generally, there might not be a very distinct policy for this, but then it is usually encouraged for all kinds of development work to take care of the environmental limits, and the carrying capacity of the environment. So, that has been encouraged in all kinds of government policies. And we see that different government takes different initiatives for the purpose; so everyone's approach, every nation's approach is very different in this regard.

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So, for example, we can see that in the USA, the White House released a memorandum in 2015, which directed the Federal agencies; the central government, who consider the value of ecosystem services in their central planning and decision-making. So, they announced, they declared or released a memorandum in this regard. This memorandum instructed the agencies, the planning agencies, and the decision-making agencies to develop and institutionalize policies. So, they would develop policy, they would create institutions and bodies for this.

So, the ecosystem services are considered in the development project and the decision-making process. This would be taken care of through a lot of appropriate planning investment or regulatory context. So, whichever tool the tools which we studied about; so, through all those things, it is required, it is advised to be taken care of. So, further, this particular memorandum also established a process for the federal government to develop more detailed guidance. So, to facilitate that, to help people incorporate these in their work; it helped them.

It gave them a process and also helped them to help them through guidance, and other support documents and tools, which would be required in terms of like policy, programs, and projects to maintain the ecosystem. So, that was done. So, here you can see the snip of the memorandum, and you can see the purpose; and what all the instructions have been given; and the link is also provided to you.

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Gross Ecosystem Product (GEP)

Indicators to measure the total economic value of all ecosystem products and services.

- GEP is the total value of final ecosystem goods and services supplied to human well-being in a region annually, and can be measured in terms of biophysical value and monetary value.
- Ecosystems that can be measured include natural ecosystems such as forests, grassland, wetland, desert, freshwater and ocean, and artificial systems that are based on natural processes like farmland, pastures, aquaculture farms and urban green land

Link: [https://www.iucn.org/asia/countries/china/gross-ecosystem-product-gep%EF%BC%89#--text=Gross%20Ecosystem%20Product%20\(GEP\)%20aims%20biophysical%20value%20and%20monetary%20value](https://www.iucn.org/asia/countries/china/gross-ecosystem-product-gep%EF%BC%89#--text=Gross%20Ecosystem%20Product%20(GEP)%20aims%20biophysical%20value%20and%20monetary%20value)

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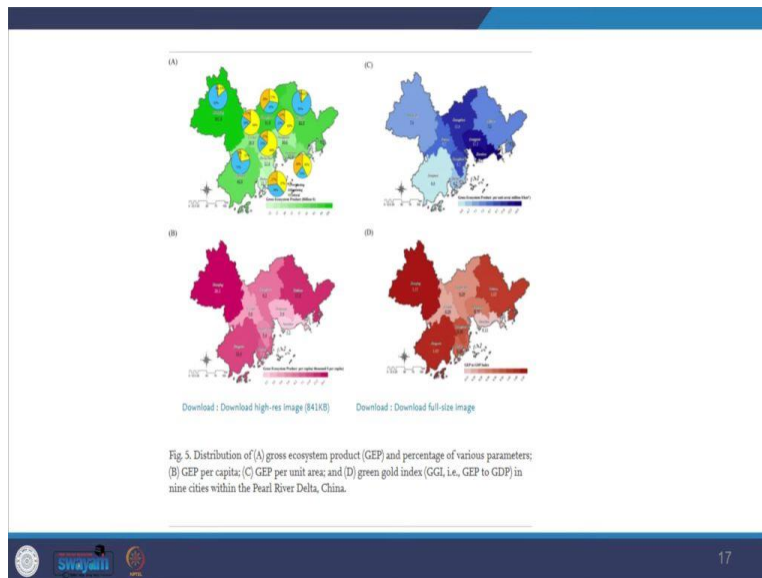
So, we also see that there is also increasing use of the concept of gross ecosystem products GEP. So, which is aligned with the gross domestic product in the economic term; so, now how you look at it from the environmental ecosystem term. So gross ecosystem product specifically means, or captures the total economic value of all the ecosystem products. So, any place what kind of ecosystem products they have, it gives economic value to that product as well as the services one gets. This gross ecosystem product is the total value of the final ecosystem, goods, and services supplied to human well-being; for our well-being in the region annually.

So, that is how it captures, it looks at the total figure, and it looks at the annual figure; and can be measured in terms of biophysical value and monetary value. So here, biophysical values are also given or it is given in terms of money. So, what kind of products or what kind of services are included?

So you can see that ecosystem measured, and it may include like the forests, what kind of grasslands are there, wetlands, the quantification of the quality of that; desert, freshwater, and ocean, and artificial systems that are based on a natural process like farmland, pasture, aquaculture farms, and urban green land.

So, you see that you have a new concept here, and then how what kind of things are measured and in an annual term. So, such kind of initiatives are also helping, aligning with the larger goal of protecting the ecosystem services and products.

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So, China in particular has adopted this gross ecosystem product GEP; in collaboration or with the support of the IUCN International Union for Conservation of Nature. So, in the image, you can see how a study has calculated ecosystem products in nine cities within the Pearl River Delta in China, you can see here. So, you would also find ongoing initiatives under various IUCN teams in India as well.

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IUCN and India

- The Mangroves for the Future (MFF)
- Address threats to all coastal and marine ecosystems and communities across Asia.
- MFF in India currently focuses on building socioecological resilience of local coastal communities.
- Key outputs
 - Include strengthening of livelihoods and income security
 - Science based policy recommendations,
 - Knowledge and awareness products,
 - Capacity building of stakeholders for enhanced governance

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

So, which is aligned with the ecosystem services; so you see the Mangroves for Future MFF project, which is an initiative to address the risk we have in the coastal and marine ecosystem. And the risk is there for the communities in this coastal and marine ecosystem area across Asia. So, this particular project focuses on that and India is part of that. In India, we particularly focus on building the socioecological resilience of local coastal communities. So, the key output that we are looking at from India or through this project is that we are looking at strengthening livelihood.

Like how people who are dependent on these ecosystem services, their livelihood; and income security can be assured or improved upon. Then we are looking at science-based policy recommendations. So, like how these can improve, and then what kind of policy interventions need to be taken care of. And then creating knowledge and awareness of these products; and then also looking at capacity building of stakeholders for enhanced governance. So, if the community is aware, all the stakeholders are aware, so it will help in improving the governance.

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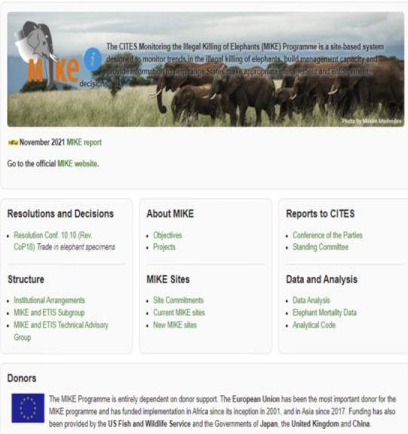
IUCN and India

Theme Species:

- Monitoring the illegal killing of elephants (MIKE)
- International collaboration under convention on international trade in endangered species of wild fauna and flora (CITES)
- Support elephant range countries in tracking trends related to the
- Illegal killing of elephants across Africa and Asia.

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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https://cites.org/eng/program/mike/index.php/portal

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So we also find another initiative MIKE, which is monitoring the illegal killing of elephants initiative. So, this is an international collaboration under conservation on international trade in endangered species of wild fauna and flora sites, which you may recollect that we have come across many times. So, through this support is extended in the elephant range countries, so which are the elephant range countries that through this IUCN extend support to these countries; they track trends related to the illegal killing of elephants across Africa and Asia.

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IUCN and India
Theme Water:

- The Regional Capacity Building - Water Governance project seeks to develop training modules for professionals, bureaucrats and diplomats.

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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So, under the theme of water, we see another kind of intervention that is going on that is like regional capacity building, where they are training people on water governance spots. So, this project mainly focuses on water governance and training them for that purpose; and looks at developing training modules for professionals, bureaucrats, and diplomats; so, how they would be trained, how they would be trained, so how that capacity can be developed here.

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IUCN and India
Theme Forest :

- Forest landscape restoration (FLR)
- Regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes.
- Restoring a whole landscape “forward” to meet present and future needs and to offer multiple benefits and land uses over time.

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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We see another intervention, which is forest landscape restoration FLR. It is another initiative where they are focusing on the process of regaining ecological functionality; like what kind of, how what kind of processes can restore the functionality of all these ecosystem services. And it would eventually help in enhancing the human well-being our well-being. It also looks at deforested areas and degraded forest landscapes.

It is more than just planting trees; it is like looking at restoration of the entire landscape; and making it futuristic as well to meet the needs of the future, as well as well as restoring their current status, restoring or improving their current status. So, that is what the project looks into. And then we also see another that is, you have a project under the theme of climate change.

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IUCN and India
Theme Climate Change :

- Initiative has been taken in the Indian Himalayan Region, Where they look at the impacts of climate change on livelihood needs of the people living in the three Himalayan States.
 - Uttarakhand, Himachal Pradesh and Sikkim

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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And you will see that to cope with the uncertainties of climate change, we have discussed that like a lot of uncertainties of climate change. So, this initiative is to help people cope up with these uncertainties, communities cope with these uncertainties. This particular project focuses on the Indian Himalayan region, where they look at the impacts of climate change on the livelihood needs of people living in Himalayan states; particularly, they look at Uttarakhand, Himachal Pradesh, and Sikkim. So, likewise, we also see this would be more of a concern for EIA.

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IUCN and India
Theme Business and Biodiversity:

- IUCN and Tata Steel through the partnership have adopted a policy
- **To include no net loss of biodiversity.**
- In addition, site-specific biodiversity management plans for Tata Steel's mining operations in India, to minimize impacts on biodiversity have been developed and are currently under implementation.

Other Partnerships

- IUCN Tata Power
- IUCN Aditya Birla Group ABG

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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We see that IUCN and India together also work on business and biodiversity, where you see interventions like IUCN and Tata Steel, they have entered a partnership; and have adopted a policy to include no net loss of biodiversity; and no net loss of biodiversity. So here, they have site-specific biodiversity management plans, and Tata Steel adopts this during the mining operations in India to minimize the impact of biodiversity. What it could have if it had been developed? So they look into that, that screening is done here, and it is also under implementation. Along similar lines, you would see that they have collaborated with Tata Power, and then also with Aditya Birla Group ABG, you will find that.

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IUCN and India
Theme Business and Biodiversity:

- **Leaders for Nature (Lfn)** :seeks to engage leading private sector companies in various sectors to bring about transformational change in the way businesses should mainstream biodiversity concerns into its entire chain of operations.
- **The Sustainable Agriscape for Future (SAFF)** – a partnership with ITC is being implemented in the Munger district of Bihar.
- Under this programme, ecosystem based interventions are being implemented for better crop productivity, while establishing sustainability of various ecosystem services.

Link: https://www.iucn.org/sites/dev/files/content/documents/iucn_india_factsheet_june.pdf

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Then they also have a similar theme, they have leaders for nature, where they look at how to engage leading private sector companies in various sectors to bring about this kind of transition; where they look at the biodiversity concerns in their entire operation. Further, we see that they also have sustainable agriscape for the future, where they are building partnerships with ITC. And then looking at how this program can improve the ecosystem services as well as how it improves the returns from those interventions.

So, we see that there are many ways in which governments are trying. However, we see that this very limited approach to how these ecosystem services have been incorporated with the EIA system, which is yet in the process of being done. So now, looking at some of the international agreements within which we are doing. So they are not a very unique or distinctive policy you see, but they have been worked around to be implemented. So, looking at the international agreements and the policy objectives, we see that there are a range of international environmental agreements.

By now, you have seen so many international agreements, which have been addressing the environmental concern. So, you may also reflect the management of global environmental resources is a difficult task; so that is not easy. So, how did these policy tools help to cope with this?

So, the diverse, multimodal things helped you to cope with such kind of environmental concerns. So, another level of difficulty that we see is that at the international level, it is like it binds the nations to agree to certain causes. But it is at the local and the national or regional level where these things are translated; so, that context you need to keep in mind.

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Main international agreements created to address biodiversity conservation are the

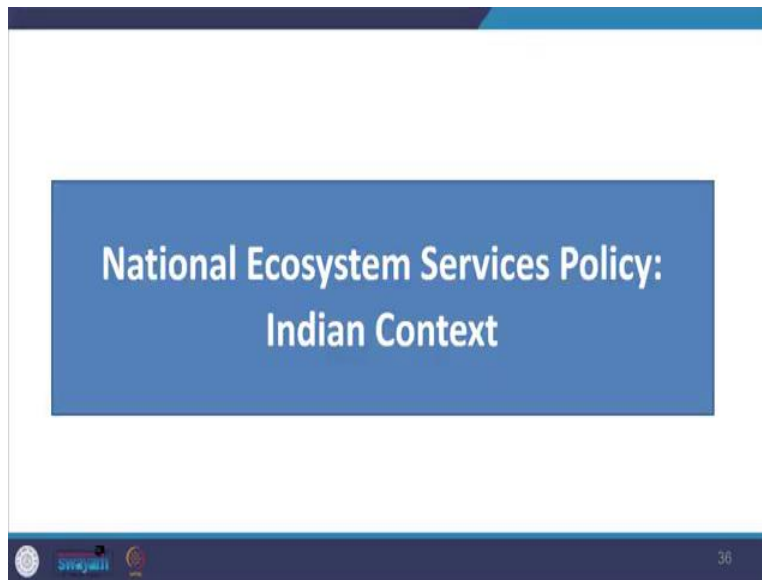
- **Convention of Biological Diversity (CBD),**
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),**
- **Convention on the Conservation of Migratory Species of Wild Animals (CMS),**
- **The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA),**
- **Convention on Wetlands (also known as the Ramsar Convention),**
- **World Heritage Convention (WHC)**
- **International Plant Protection Convention (IPPC)**

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And looking at the international environmental agreements, you can see these are the key ones, we have also seen this before. So, you have a convention of biological diversity, the convention of biological diversity, then you also see conservation on International Trade in Endangered Species of Fauna and Flora.

Then, you also see the Convention on Conservation of Migratory Species of Wild Animals, The International Treaty on Plant Genetic Resources for Food and Agriculture, the Convention on Wetlands; the you also see World's Heritage Convention, and then the International Plant Protection Convention. So, you see all these which are there; so, we do abide by these.

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So, looking at like Indian context, coming to national ecosystem services policy. We see that in our place as we have seen this in our initial legislation part.

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The present environmental legislation framework of India. It is an Umbrella Policy Act which we have is the Environmental Protection Act of 1986; within that Umbrella Act, all these comes. Then we also find the law related to the management of forests and wildlife, which is like in Forest Conservation Act of 1980 we see. We also see the Wildlife Protection Act 1972. So, in India, this is the Umbrella Act which we see; but we do not have a specific law or a policy on ecosystem services. But, we do have some related policies and laws on ecosystem service.

So, which can be aligned is the Indian Forest Act of 1927, which helps to define what kind of concessions would be given to villagers. And then there are also village forests, which are constituted; then you also have

protected forest and transit of forest produce. So, all these provisions are made within the Indian Forest Act; then you also see the Forest Rights Act of 2006. Then you also see the guidelines and orders issued by the Ministry of Environment and Forests in terms of joint forest management, and best practices for the extraction of medicinal plants.

They all are important for the sustainability aspects and also to embrace sustainability, and economic sustainability development at the local level. We find the Wildlife Protection Act of 1972; so it looks into the management of national park and wildlife sanctuary protection, like identified species and communities, and also the conservation of different reserves. Then, you also find the Biological Diversity Act 2002, which provides guidance and sustainable use of biodiversity; then gives access and benefit sharing of biodiversity for commercial use, identification of species for conservation, and then also takes care of the documentation path.

Then you also see the Protection of Plant Varieties and Farmers Rights Act; you also find the scheduled tribe and Other Traditional Forest Dwellers Act also referred to as Forest Rights Act 2006. So, this one defines community, forest resources, and what is accessible; so they community, critical wildlife habitat. It also provides ownership of minor forests produced by the local community; so they have access to these resources this ecosystem services. And provides a period for the security of forest-dwelling communities. So, it protects them, and it maintains that relationship which is required.

And then the functioning of the provision is also linked with the performance of ecosystems, in terms of delivering the ecosystem services for livelihood; so, this takes care of that. Then you also find certain state-level legislation, which is very particular to different states. For example, you would find the United Khasi Jaintia Hills autonomous district, the Management and Control of Forest Act 1958. And then you also find Garo Hills autonomous district Management and Control of Forest Act 1961; all of these recognize this traditional forest land use system; such as (())(23:02), Law Kim Thong, and Law (niam).

So, they recognize those kinds of services, the casual services, the resource services they receive; and they protect it. And then you may also find wetland rules, and then also there have been a lot of studies, which have taken place to understand this biodiversity and ecosystem services.

So, we also see certain aligned acts with this that as the Water Prevention and Control of Pollution Act. And then we also see the Water Cess Act, Air Act, and Public Liability Insurance Act. So, all these acts also become the foundation of the domestic environmental regulations that we see here.

So, in the context of the conservation of the ecosystem of water resources and atmosphere; so they provide for setting up of a pollution control board. So, we see the role of pollution control boards at the central, at state levels; they are empowered to prevent control and reduce air and water pollution. And to advise the government on matters related to such kinds of pollution. So, you see that the Central Pollution Control Board coordinates

the activities of the state boards as well. So, you see that these acts also specify the industrial units have to provide on-demand all information regarding the effluent treatment methods.

So, what kind of industry, what industries, what kind of interventions they are taking, so, that that they are liable to provide. And then through this, they can also use a legal framework, where they can collect taxes, charges, or fees for the ecosystem services. So, in India currently, we see that there are a range of price and market-based instruments; if you recollect, we have studied the price and market-based instruments; such as, they apply tax, charge, charge for the services, or set fees for the ecosystem goods and services.

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• **Convention on Biological Diversity CBD**

Key agreements adopted during the Earth Summit held in Rio de Janeiro in 1992

- India is a Party to the Convention on Biological Diversity (CBD)

Access and Benefit Sharing (ABS)-

- System in which genetic resources may be accessed, and benefits resulting from their use shared by users with countries that provide them.

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So, if you will recollect India is a signatory to the Convention on Biological Diversity CBD. And this is one of the key agreements, which was adopted during the Earth Summit held in Rio de Janeiro in 1992. So, we are signatories to that, and a lot of our activities align with that. So, if we are signatories, then how do we translate it into national or regional policies and the project? So, being a party to the convention, we must prepare a national biodiversity strategy and action plan for implementing the convention at the national level. So, we developed a national policy and micro-level action strategy on biodiversity in 1999.

And then we also adopted that eventually in National Environmental Policy. So, we adopted that eventually in the National Environmental Policy In 2006; and then we also saw National Biodiversity Action Plan was developed through the comprehensive inter-ministerial process. So, through this how did we; we were signatories, and then we prepared the national policy and micro-level action strategy on biodiversity. Then we adopted it in NEP and eventually prepared the National Biodiversity Action Plan.

So, One of the three objectives of the Convention on Biological Diversity, we see that one key element is access and benefit Sharing ABS. So, This ABS refers to the process, ways, and methods, in which the genetic

resources may be accessed, by other nationalities as well; and then the host community, how they can get the benefits of sharing it with outsiders outside the country, so, it takes care of that.

So, this convention prescribes that access to genetic resources is subject to national legislation. So, what rules do we have? Accordingly India after an extensive consultation process enacted the Biological Diversity Act in 2002; to give effect to the provision of CBD, including those related to it.

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India has also prepared a **National Biodiversity Action Plan (NBAP)** in 2008, and an Addendum to NBAP was prepared in 2014 with 12 National Biodiversity Targets, developed in line with the 20 **Global Aichi Biodiversity** targets.

Annual Report
2020-21

Government of India
Ministry of Environment, Forest and Climate Change

(MoEFCC,2021)

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So, India had prepared a National Biodiversity Action Plan in 2008; so, it added to that. Further in alignment with that, it also prepared National Biodiversity Targets NBTs in 2014. And where they prepared 12 National biodiversity targets and they were aligned with the 20 Global IT, I key biodiversity targets.

We also find the Nagoya Protocol on ABS, it was adopted under the same convention, and it was adopted in 2010. And then the main purpose of this was the fair and equitable sharing of benefits, arising from the utilization of these resources; including appropriate access to resources and appropriate transfer of relevant technologies here. And then you see that India signed this protocol in 2011 and ratified it in 2012. It came into force in 2014, and it is being implemented at the national level through this Biodiversity Act.

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Nagoya UN Biodiversity Summit in October 2010,

- 192 countries (and the European Union) agreed to a new “Strategic Plan” of action on biodiversity and ecosystems, with the following vision:
 - “By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.”



Methods of Environmental and Social Impact Assessment, Roy Emberton, Richard J. Wenning and Jo Treweek, 2018, Pg 447

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The Nagoya protocol would also contribute to the other objectives as well, relating to conservation and sustainability. The idea was that the biodiversity-rich countries would get benefits by sharing those services, and it would be also translated to the local community. And they would be encouraged to conserve and make sustainable use of these biodiversity resources.

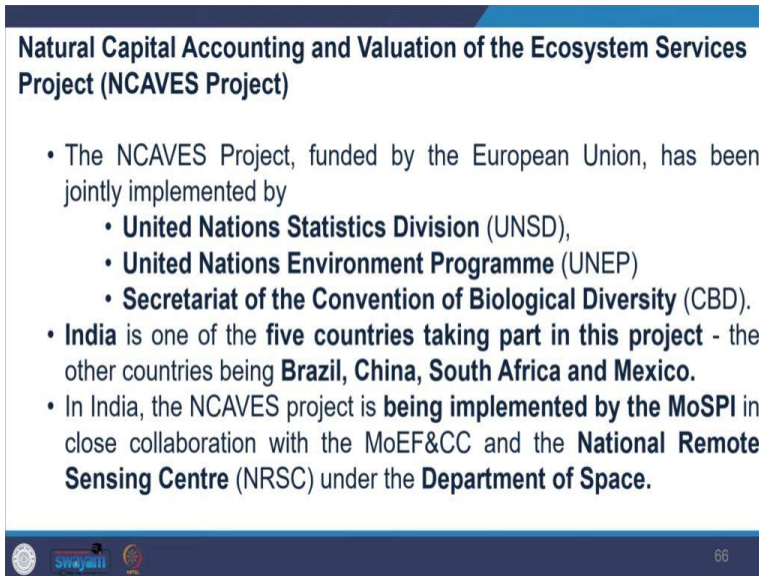
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Examples of Initiatives Related to Ecosystem Services in India

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Now, looking at the examples of initiatives related to ecosystem services in India, like what kind of initiatives we are taking.

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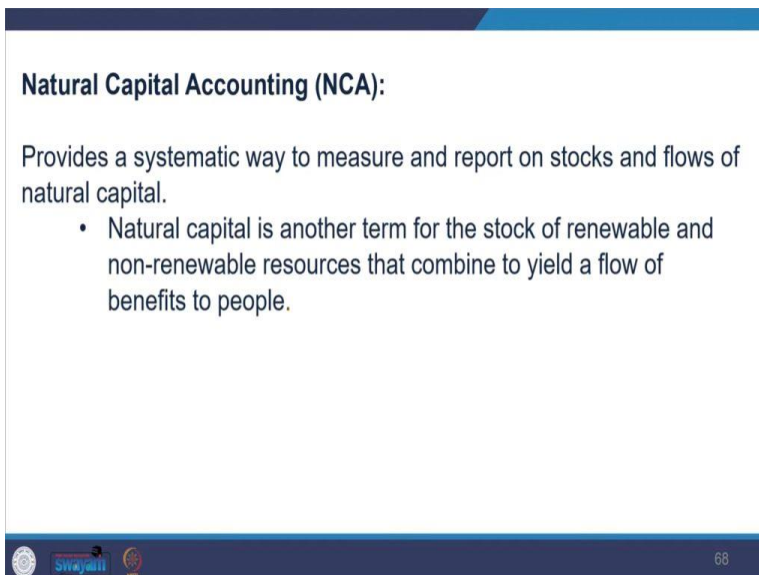
Natural Capital Accounting and Valuation of the Ecosystem Services Project (NCAVES Project)

- The NCAVES Project, funded by the European Union, has been jointly implemented by
 - **United Nations Statistics Division (UNSD),**
 - **United Nations Environment Programme (UNEP)**
 - **Secretariat of the Convention of Biological Diversity (CBD).**
- **India** is one of the **five countries taking part in this project** - the other countries being **Brazil, China, South Africa and Mexico.**
- In India, the NCAVES project is **being implemented by the MoSPI** in close collaboration with the **MoEF&CC** and the **National Remote Sensing Centre (NRSC)** under the **Department of Space.**

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So, we see that natural capital accounting and valuation of ecosystem services project, which is the NCAVES Project you can see. So, now in this project, you see that it is funded by the European Union; and it is implemented by the United Nations Statistics Division. Where India is one of the five countries taking part in this project; and this project is implemented through the Ministry of Environment Forests and Climate Change, and also the National Remote Sensing Center NRSC under the Department of Space. So, this is taken and you can also see look at the concept of natural capital accounting.

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Natural Capital Accounting (NCA):

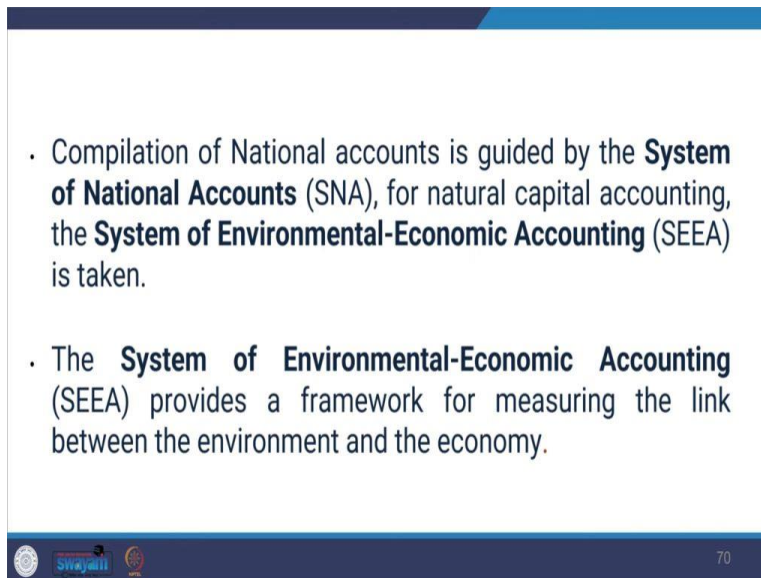
Provides a systematic way to measure and report on stocks and flows of natural capital.

- Natural capital is another term for the stock of renewable and non-renewable resources that combine to yield a flow of benefits to people.

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So, it is an umbrella term covering efforts to make use of an accounting framework to provide a systematic way to measure and report stocks and flows of natural capital. So, we are also looking at how these national capitals are, and then how the stock is, and how the flow is happening. So, this NCA covers accounting for individual environment assets or resources, both biotic and abiotic; and through this project, it has been seen.

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- Compilation of National accounts is guided by the **System of National Accounts (SNA)**, for natural capital accounting, the **System of Environmental-Economic Accounting (SEEA)** is taken.
- The **System of Environmental-Economic Accounting (SEEA)** provides a framework for measuring the link between the environment and the economy.

And then you can see that there has been a compilation of the national account of the country, which is guided by a system of national accounts. And then you also see a system of environmental-economic accounting, which is also taking care of all these ecosystem services. So, this system is a central framework, where they give you a method or process, which is adopted as an international statistic standard by the UN Statistical Commission. And this accounts system brings into direct focus, the relationship between the environment and economy; which otherwise is not revealed through the other process. So, that is highlighted here.

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EnviStats India

- The scope of **environment statistics** encompasses all dimensions of the **environment, Earth, Water or Air, the biotic and abiotic matter** found within the natural environment, and various concerns arising out of impacts of human footprints on it.
- The objective : To provide information about the environment, its changes over time and across locations, and the main factors that influence them.

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- Atmosphere And Ozone Layer
- Climate Change

EnviStats India 2021, Vol. 1: environment statistics

31/03/2021 | Ministry Of Statistics And Programme Implementation

Environment statistics enumerate various aspects of the environment and human interactions with it. The scope of environment statistics encompasses all dimensions of the environment, be it Earth, Water or Air, the biotic and abiotic matter found within the natural environment, and various concerns arising out of impacts of human footprints on it. The objective of environment statistics is to provide information about the environment, its changes over time and across locations, and the main factors that influence them. Ultimately, environment statistics aim at providing statistical information to improve knowledge of the environment, to support evidence-based policy and decision making, and to provide information for the general public, as well as for specific user groups.

Tags: Environment India Statistics Biodiversity Forests Ecosystems Land

<http://www.indiaenvironmentportal.org.in/content/470163/envistats-india-2021-vol-1-environment-statistics/>

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Then, we also see EnviStats India. So, environmental statistics provides various aspects of environmental and human interaction; so, it provides that and the scope of this statistics is that, it provides all dimensions of environments, earth, water, air, and so on. So, it gives you all the details. And then what kind of changes are happening over time and in different locations; and what are the different factors, which are influencing them; so, that kind of information it provides.

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National Mission for Green India (GIM)

- One of the eight Missions under the National Action Plan on Climate Change (NAPCC).
- Launched in February, 2014

Objective:

- To safeguard the biological resources of our nation and associated livelihoods against the danger of adverse **climate change**
- To recognize the vital impact of forestry on **ecological sustainability, biodiversity conservation and food-, water- and livelihood-security.**

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Then, we also see the national mission for green India. So, here you see that Green India Mission, GIM is one of the eight missions under the national action plan on climate change, which is being adopted; and it was launched in 2014. And then the main idea of this was to safeguard the biological resources of our nation, and like also take care of the livelihoods; and protect the livelihood with the negative impact of climate change.

So, the idea was also to recognize the vital impact of forestry and ecological sustainability, biodiversity conservation, and food, water, and livelihood security. So, one was to protect, protect safeguard, the second was to acknowledge the importance of it. So this was, these were the examples from India; we also find some international examples of initiatives.

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The UK

- National-level Ecosystem Assessment, in line with the Millennium Ecosystem Assessment's approach.
- Estimated Value– Example -coastal wetland provided flood protection , and the benefits were worth £1.5 billion annually

Methods of Environmental and Social Impact Assessment, Roy Emberton, Richard J. Wenning and Jo Treweek, 2018, Pg 307

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So, you can see that the UK is one of the first countries to carry out national-level ecosystem assessment. And then they did it in line with the Millennium Ecosystem Assessment approach, which is, which is a framework; which is designed how to assess what kind of ecosystem services are there.

And following this assessment, helped them to recognize what is the value of the ecosystem, what kind of resources they have; and what is the value of those resources. So, for example, you can see that they found out that coastal wetlands provided flood protection in the range of 1.5 billion pounds annually.

So, that was like the cost of the environment; that kind of services that environment was providing, that kind of protection that environment was providing. So, they have also noticed that there has been a decline in ecosystem services.

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• England's Biodiversity 2020 strategy to “**support healthy well-functioning ecosystems** and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people”

• **Nature Improvement Areas** -conserve areas of particular importance for biodiversity and ecosystem services through management and establishment

• Restoration of degraded ecosystems as a contribution to climate change mitigation and adaptation.

Methods of Environmental and Social Impact Assessment, Roy Emberton, Richard J. Wenning and Jo Treweek, 2018, Pg 307

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Further, we also see that they have England's Biodiversity 2020 strategy and the idea was to support a healthy well well-functioning ecosystem; and then establish a network between the ecological system. So, they identified nature improvement areas, which were like the main idea of conserving areas of particular importance for biodiversity and ecosystem services. And this they would conserve through management and by setting up this nature improvement area. Apart from this, they would also restore the degraded ecosystem, and then contribute towards climate change, mitigation, and adaptation.

So, we further see that the EU also published a vision and mission for 2020 for biodiversity, and they had certain targets to be met by 2050, to take care of the natural capital; and how they can be protected and; further, how they can stop the loss of biodiversity.

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Vietnam,

- **Decision 380** sets up a pilot policy for payments for Forest Environmental Services, collecting money from entities that benefit from ecosystem services provided by healthy forests.

Methods of Environmental and Social Impact Assessment, Roy Emberton, Richard J. Wenning and Jo Treweek, 2018, Pg 448-449

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Now looking at Vietnam, we see that they have a pilot policy, where they have worked out payment for the forest, and environmental services; so, you pay for whatever services are provided. So, collecting money from entities that benefit from those kinds of services, could help them to protect the forest as well as take care of the forest.

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United States

Food, Conservation, and Energy Act of 2008

- Establishes technical guidelines that measure the environmental services benefits from conservation and land management activities.

The Oregon Senate Bill 513

- Creates an Ecosystem Services Markets Working Group to advance policy recommendations for creating a framework of integrated ecosystem services markets in Oregon that produce positive ecological.

Bharati Law Review, July – Sept., 2013

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Now looking at US, in US, you can see that there is the Food, Conservation, And Energy Act of 2008, which was established to provide technical guidance that would provide measurements of environmental services. What kinds of benefits are being derived, and it would also help in conservation and land management?

We also see Oregon Senate Bill 513, and through this, they created an ecosystem service market, working group. And this working group would advance policy recommendations for creating a framework for

integrating ecosystem services markets, in the state, and state; and so that they could have positive results for ecology.

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Brazil

Acre State Legislature

- Establishes the System of Incentives for Environmental Services, the institutional and legal framework for Acre to measure and value its environmental services.
- State of **Amazonas drafts** a policy on environmental services would implement PES programs in the state.

Bharati Law Review, July - Sept., 2013

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So, looking at Brazil, we see another Acre State Legislature. So, this was established to provide incentives for environmental services, and also to set up an institution and legal framework for Acre; and then to measure and assign value to all these services. We also see that they have what you will also look at in the methods part; that they have the state of Amazon's draft, where they prepared a policy on paying for ecosystem services PES program in the state; so, will be looking at it later again. So that was about some of the examples from the international initiatives.

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International Finance Institutions

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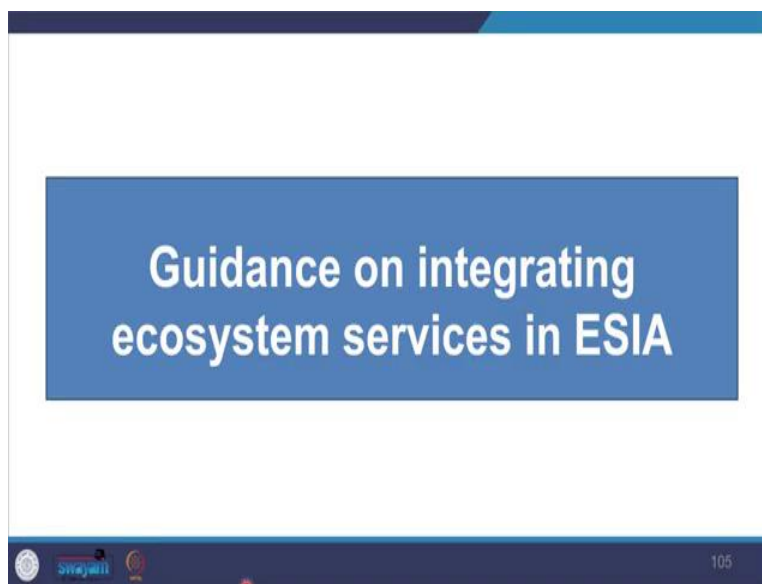
So, now we also see how international finance institutions ensure that people undertake the EIA process, how they undertake it; and consider what kind of impact it would have on ecosystem services.

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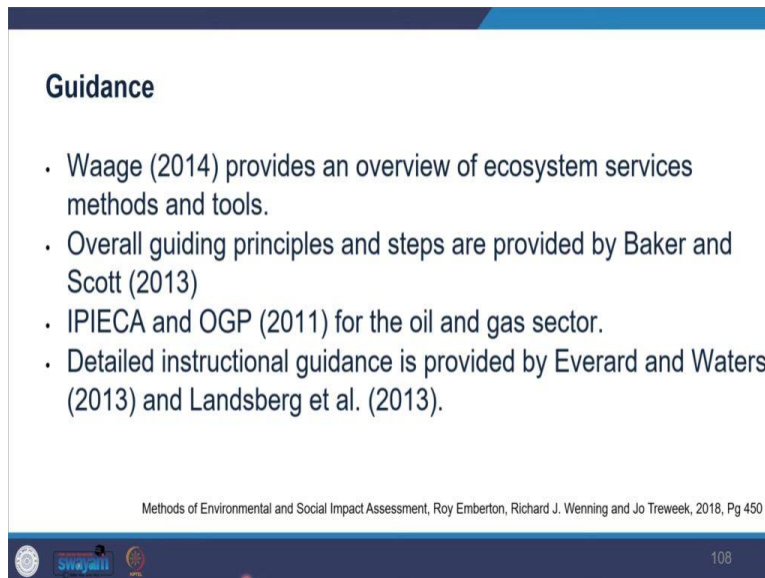
So, we see these agencies in particular international finance institutions, World Bank, through its performance standards 1, 4, 5, 6, 7, and 8. Now, they all refer to ecosystem services, and in particular performance standard 6; which requires that the client who is looking for a loan for their developmental project, have to show how the benefits of these ecosystem services. How they are going to maintain it, and if something is happening; then how they can mitigate it; and what kind of measurements they are taking as. And it is advised that they maintain the value and functionality of the priority services. So, you see that when institutions like this imply; you see that institution like this when they asked, so these all things are streamlined in the EIA process.

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Now moving on, we all, will see what kind of guidance is available about, how to go about integrating ecosystem services in EIA.

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Guidance

- Waage (2014) provides an overview of ecosystem services methods and tools.
- Overall guiding principles and steps are provided by Baker and Scott (2013)
- IPIECA and OGP (2011) for the oil and gas sector.
- Detailed instructional guidance is provided by Everard and Waters (2013) and Landsberg et al. (2013).

Methods of Environmental and Social Impact Assessment, Roy Emberton, Richard J. Wenning and Jo Treweek, 2018, Pg 450

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So, there are limited guidelines, but you can see the available guidelines, you can see the list here. So, there are a couple of studies that provide methods and tools; and how these have to be incorporated. We are going to see this more when we deal with the EIA method section; where we will learn about how to undertake EIA. What will be the procedure of taking EIA when we deal with the ecosystem services; so some of the references are given here. So that was for this session.

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Summary

- 1 Background on Ecosystem Services
- 2 International agreements and policy objectives
- 3 National Ecosystem Services Policy: Indian Context
- 4 Examples of Initiatives Related to Ecosystem Services in India
- 5 International Examples of ecosystem services policy, legislation
- 6 International Finance Institutions
- 7 Guidance on Integrating Ecosystem Services in ESIA

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References

- 1 EIA Training Resource Manual, UNEP, 2002;
https://wedocs.unep.org/bitstream/handle/20.500.11822/26503/EIA_Training_Resource_Manual.pdf?sequence=1&isAllowed=y
- 2 ADB Sustainable Development Timeline;
<https://www.adb.org/sites/default/files/publication/29664/world-sustainable-development-timeline.pdf>
- 3 UN Climate Talks;
<https://www.cfr.org/timeline/un-climate-talks>
- 4 The Sustainable Development Agenda;
<https://www.un.org/sustainabledevelopment/development-agenda-retired/>



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So, summarizing what we learned in the session we looked at the context of ecosystem services. We have seen some of the ecosystem services concepts before, and then we are going to touch upon them later when we do the methods section. Then we also looked at the National Ecosystem Service Policy what India has; and what kind of policies aligned together to address the cause. And then we looked at some of the examples at the national level as well as the international level; and then we looked at like what kind of requirements are there, by the international finance institutions.


Then we looked at some of the available guidance, about how to integrate ecosystem services into the EIA process. So, these were the references that we used for today's session.

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Suggested Watch and Read




<https://www.youtube.com/watch?v=6KxE4Kv9A8>



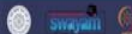
https://www.youtube.com/watch?v=C38e3_Saxg










<https://www.youtube.com/watch?v=7iyYwF1F8xY>



<https://www.youtube.com/watch?v=ku0Nmh47VTA>


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 Please feel free to ask Questions. 
Let us know about any Concerns you have 
 Do share your Opinions, Experiences and
Suggestions.
Looking forward to Interacting and
 Co-learning with you while exploring EIA 

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And then there are a lot of examples we could not cover a lot of them. So, there are suggested watch and read which you can see. Look at all the case studies if you wish to. So, those are available for you here and please feel free to ask questions. Let us know about any concerns you have to share your opinions, experiences, and suggestions. Moving forward to interacting and Co-learning with you while exploring EIA. Thank you.