

Environmental Impact Assessment
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Lecture 25

EIA- Law, Policy and Institutional Arrangements for EIA Systems (Part-XIII) Transport, Landscape and Visual

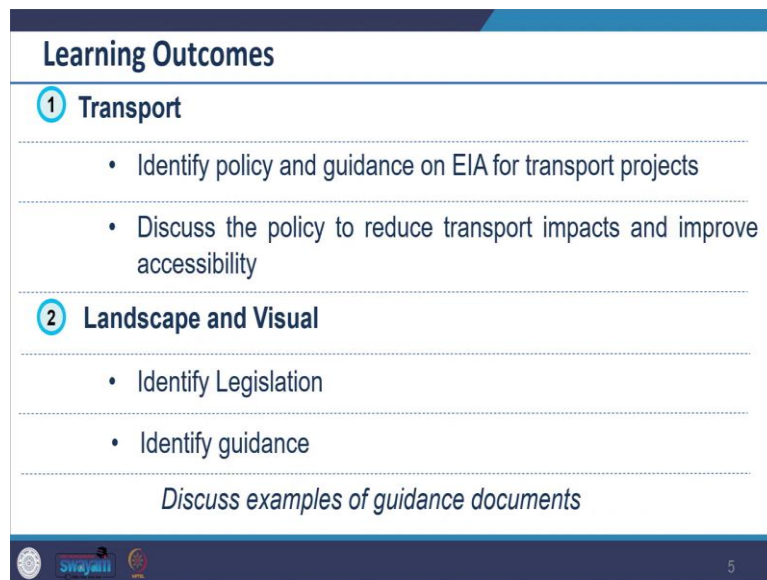
Welcome to the course- Environmental Impact Assessments, in the series of law policy and institutional arrangements for EIA systems, today, we will be covering 2 subtopics. So, we will be looking at transportation and then, we will also look at landscape and visual. So, what are the policies and all kinds of arrangements for that, and what kind of standards are there?

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Coverage	
①	Transport
	<ul style="list-style-type: none">• Policy and guidance on EIA for transport projects• Policy to reduce transport impacts and improve accessibility
②	Landscape and Visual
	<ul style="list-style-type: none">• Legislation on Landscape and Visual• Guidance on Landscape and Visual <p style="text-align: center;"><i>- Guidance documents on landscape and visual impact assessment related to Roads, Renewable Energy and others</i></p>

So, accordingly, our coverage would be, that we will be looking at policies and guidance on EIA for transport projects. So, what are the policies and guidance involved, then we will look at policy to reduce transport impacts and improve accessibility. So, what kind of policies are being adopted you should recollect our initial lectures on how we understand policies and the different modes and techniques that are used. So, in the landscape and visual section, we will again look at the legislation or landscape and visual and then look at some of the guidance, we will look at some of the examples as well.

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Learning Outcomes

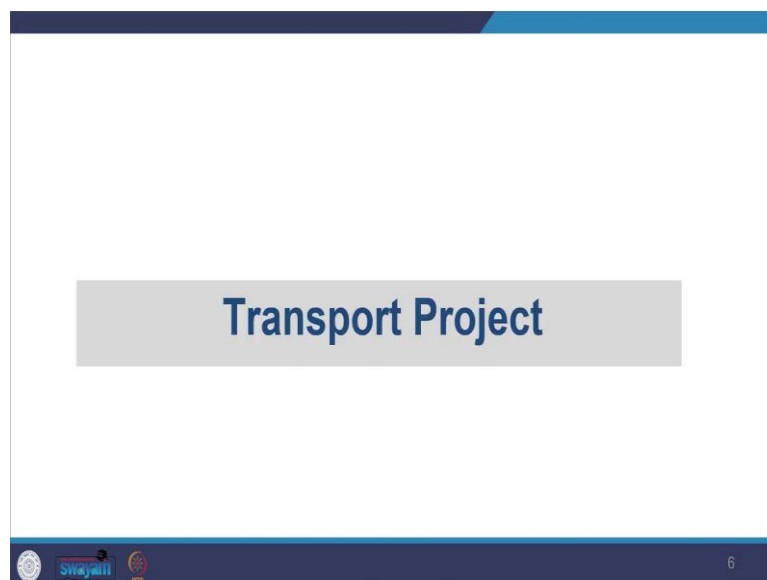
- 1 Transport**
 - Identify policy and guidance on EIA for transport projects
 - Discuss the policy to reduce transport impacts and improve accessibility
- 2 Landscape and Visual**
 - Identify Legislation
 - Identify guidance

Discuss examples of guidance documents

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So, our learning outcomes expected learning outcomes are that, after completion of this particular session, you should be able to identify policies and guidelines related to transport projects, when you undertake EIA for transport projects. And then, you should be able to discuss the policy to reduce transport impacts and how, and what kind of policies are adopted for improving accessibility. Then, in the landscape and visual section, again, you are expected to identify legislation, and then identify guidance, and then discuss these with the help of examples of various guidance documents.

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Transport Project

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Policy and Guidance on EIA for Transport Projects



So, looking at the first section on the transport project, in this, we will look at the policy and guidelines on EIA for the segments. So, we see that there are several institutions both at the national level and international levels that, have developed guidance on transport policy and they have been trying to promote sustainable transport, and they have also given guidelines on methods and different approaches, which one should adopt to evaluate environmental impacts.

So, if we see that, roads have like, they have a range of environmental impacts, and the ranges would depend on land use as the kind of land use where and in what context it is like for example, if it is in the road is coming up in an urban setting, the impact would be different, and the road is coming and the rural setup in the impact would be different and the land use might also change accordingly.

So, you will also see that environmental impact will also vary with the construction of the new roads. So, where you are doing your new road construction, the nature of environmental impact would vary. And then it would vary also with the regeneration project. So, if you are regenerating, you are dealing with regeneration projects, which we, where you are uplifting or improving the existing roads, then also the nature of impact would be different. So, you keep that, in mind and then see how different impacts vary as per the nature of the project.

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World Bank Guide, 1997

A Handbook on Roads and the Environment

Key objective:
Integrate environmental thinking into road planning and management,
Improve communication among different disciplines and interest groups, which often use different concepts and terminology

Link: <https://www.cbd.int/financial/doc/wb-roadsandenvironment1997.pdf>

(Therivel, R. and Wood, G., 2018)

The slide also features a blue sidebar with the book's cover. The cover includes the World Bank logo, the title 'Roads and the Environment: A Handbook', and four photographs showing road construction, a road winding through a hilly landscape, a person walking on a dirt road, and a person on a bicycle on a paved road. The cover also lists the editors: 'Edited by Kim Simons and Christopher Hahn'. The slide number '12' is visible in the bottom right corner.

So, we see the World Bank's extensive guide, and the guide indicates how to consider the environment in the planning and management process of the road. They show how to establish clear communication between different work and interest groups related to the project. So, when you are dealing with roads, you will have different groups which will be involved, and then there will be different domains and there will be different agencies which will be involved.

So, how do you take care of that? So, that, all will come here. And then guidebook also shows how to implement the environmental strategies and how to follow up on the proposed environmental strategy. So, what kind, how you are going to implement those strategies in your project, and then how you will take care of the follow-up, like when the project is done, how you are going to follow up that, those environmental strategies are followed or not.

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Five Types of Environmental Impact Assessments (EIAs) applied to Road Projects

- **Project-specific EIA**, assessing individual new roads (or public transport infrastructure)
- **Programmatic EIA**, examining a number of individual projects that may be delivered together as a package or programme
- **Summary environmental evaluation**, focusing on specific categories of impact and their mitigation
- **Regional EIA**, examining all the planned projects within a specified geographical area at the sub-national level
- **Sectoral EIA**, strategically assessing all projects of a certain type, such as transport infrastructure in a relatively large geographical area

(Therivel, R. and Wood, G., 2018)

swayamprakash

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So, through the guide, we see 5 types of environmental impact assessments for the roads you see, which are like you see project-specific EIA. So, you must have heard about this project specifically Yeah, yeah. So, in that, project-specific EIA you have individual new roads or public transport infrastructures are assessed through the category of project-specific EIA. So, the project-specific environmental assessment is the most common form of EIA. So, this very commonly used format of EIA, where we review individual new projects road projects, and we have like this is a very usual and commonly used one.

So, we have considerable experience in this regard. And we know how to handle most of the aspects of it. Conceptually, if we see EIA, EIA facilitates the identification of potential impacts on the local and the immediate environment within the context of the region or a sector. So, conceptually when we handle EIA, that, is what we see that will be the potential impact of it on the local and the immediate environment of a particular project in the region or particularly on that, sector. So, this project-specific EIA addresses this basic requirement and addresses the practice of EIA.

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Benefits:
Project-specific EIA allows road agencies to

- Familiarize themselves with the environmental status of the proposed site and anticipate any environmental impacts that may arise from the road project
- Highlight likely design problems, thus permitting the agency to make early changes and avoid costly delays at a later stage
- Integrate the project into the existing environment

(The World Bank, 1997, Pg. 8)

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So, there are benefits of project-specific EIA, though it is very common, it is a simplistic approach and it handles only single individual projects, but there are benefits of this. So, it allows road agencies to make clear of themselves about what is the environmental status of the proposed site. So, what is this situation there, and identify any environmental impacts that, may arise that, may come up because of the proposed road project?

So, this allows the authority to raise alarm on any design problems they see. So, if there is any problem with the project, they can rectify it. So, it also allows the rectification of this at an initial stage. Because of these steps, also facilitates better integration of the project into the existing environment.

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(Therivel, R. and Wood, G., 2018)

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So, another type of EIA, we learn through the guidance includes programmatic EIA, in this programmatic EIA, we examine several individual projects that, may be delivered together as a package of a program. So, you might have heard about the program that, we are going to build several roads and so on in a particular area. So, it is seen in all totality. So, programmatic EIA has been developed for the concentration of groups

of projects in a cumulative manner, which are similar in type scope, and scale and whose impacts are generally well understood.

So, we know about it, they are similar. So, do not do one like individual EIA for that. So, we can do it for the complete group of projects. Examples of this include sewage treatment facilities, road maintenance and rehabilitation projects, and small bridge constructions. So, another type is the summary environmental evaluation. So, this is also like the rapid assessment.

So, in which the focus is on specific categories of impact and their mitigation. So, this type of study focuses on specific impacts and then mitigation, the results of this type of study can take a variety of forms. So, they are sometimes represented as a self-standing mitigation plan or you can also have an environmental management plan. So, you this screening scoping and consultants task are normally used to decide this summary Environmental Assessment here.

So, another type, that we see is the Regional EIA. So, under this regional EIA, we look at the planned projects within a specified geographical area. So, this geographical area can be at the sub-national level or any other like it can be at the district level state level, intra-district level, or interstate level, and that kind of project is evaluated under this regional EIA.

So, Regional EIA is used to assess environmental effects relating to the broad spatial context of the proposed project. And then the main purpose of this the main purpose is to assess the cumulative and the other potential effects. So, what will happen cumulatively taking all together and looking at the impact of the divisional level and what kind of potential effects will happen of the projects on this particular region geographical area, which we are looking at and this area again could be the administrative region or the environmental region.

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Objective of REA

- To assess the cumulative and other potential effects that all projects (present and future) proposed for a geographic area or administrative region might have on the environment

(The World Bank, 1997, Pg. 9)

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So, whichever boundary we define here are examples of these regional EIA could be the like, you can have environmental areas like coastal zones, you can have forest regions or you can have watershed regions or you can have certain administrative boundaries like you can look at the municipality level or you can look at the state level or district level. So, you see that regional environmental assessment can cover 1 project or several multi-sectoral projects and one can see all of them together in a particular geographical context. So, at the end of all these categories, we see Sectoral EIA,

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(Therivel, R. and Wood, G., 2018)

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So, through this, all the projects of a certain type are strategically evaluated. So, you take all within the sector, what projects will come and you evaluate them for example, transport infrastructure and relatively larger geographical area. So, all the transportation infrastructure would be evaluated for its total impact. So, the main idea of the Sectoral EIA is to look at the macroscale.

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Objective of the Sectoral EIA

- To assess macroscale development alternatives and, through this process, formulate sound environmentally based advice on appropriate and sustainable development goals

(The World Bank, 1997, Pg. 10)



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So, that means, the gross, gross impact like getting a gross sense like totally what is going to happen in this area. So, you assess you evaluate the micro-scale scenario here and through this process, you formulate sound environmentally based strategies on what kind of sustainable development strategies have to be taken.

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Sectoral EIA

- Highlights the benefits and costs of undertaking sector-wide action by comparing one strategy with another
- In the context of roads, address a sector-wide investment in a relatively large geographic area (example -State, integrating environmental concepts and strategies into the transportation planning process)

(The World Bank, 1997, Pg. 10)



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So, we see that, sectoral EIA highlights, the benefits, and costs of undertaking sector-wise action by comparing one strategy with the other. So, it allows you to compare what is a better strategy and so, on. And particularly in the context of roads, the Sectoral EIA might address a sector-wide investment in a relatively larger geographical area. So, you can also evaluate how that, when the sector is making certain investments, so, they can evaluate what kind of impact it will have.

So, this was about the World Bank. Now, you see that the European Investment Bank also follows similar strategies. So, they under their policy that, under policy, they only finance those kind of projects, which are more on the sustainability lines. So, all the transportation which are on these who which addressed to sustainability. So, they only finance those kind of projects.

For example, you have rail projects or public transportation projects they would fund so, rail projects water, and public passenger transport and also, they have been supporting intermodal transport systems one connecting to the another and how people can have seamless movement and then also tele working by like supporting information and communication technologies.

So, then there can be less need for really commuting and they also support projects for balanced regional development and also kind of projects of urban regeneration and development and so on. So, you see that, in they have certain strategies, where they support some kind of such kind of projects, where sustainability addressed.

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European Investment Bank (EIB), 2013

- The EIB calculates the economic returns of its projects using internationally accepted methods
- Beyond financial viability considerations, it also appraises the socio-economic costs and benefits to make sure that the projects the EIB finances constitute a sound contribution to society at large

The Economic Appraisal of Investment Projects at the EIB
Version March 2013 – Under review

Link:
https://www.eib.org/attachments/thematic/economic_appraisal_of_investment_projects_en.pdf

(Therivel, R. and Wood, G., 2018)

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So, the European Investment Bank calculates the economic returns of its project using internationally accepted methods. And, and then they look at not and they not only look at the financial viability aspect, but they also look at the socio-economic costs and benefits which the project brings so, that, weigh the address the address to the larger environmental and social goals.

So, you see that, the bank highlights environmental issues at the global and the regional levels. So, the range of issues which we have already discussed in the environmental status. So, the bank addresses these issues and concerns through international cooperation. So, they all have that cooperation and then they support each other for this range of projects.

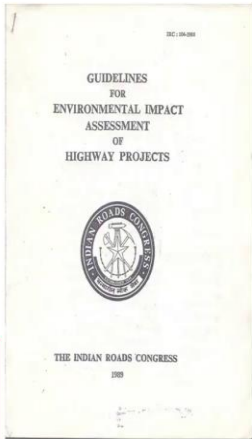
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Indian Guidance

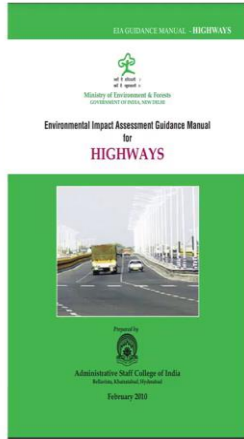
- Guidelines for Environmental Impact Assessment of Highway Projects, 1989
- Environmental Impact Assessment Guidance Manual for Highways, 2010

Link:

- http://environmentclearance.nic.in/writereaddata/form-1a/home/links/highways-10_may.pdf
- <https://theibrarofcivilengineer.files.wordpress.com/2015/09/irc-104-1988-guidelines-for-environmental-impact-assessment-of-highway-projects.pdf>



THE INDIAN ROADS CONGRESS
1989



Environmental Impact Assessment Guidance Manual
for
HIGHWAYS
February 2010

(Therivel, R. and Wood, G., 2018)

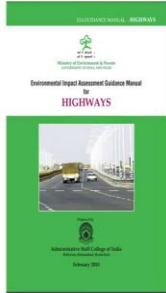
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So, now moving on, we see that, different countries have national guidance for instance, we see in India government has prepared manuals for the different sectors, and those kinds of support are created. And these guides we see guidelines have been created for an EIA for highway projects and how this can be done.

So, you see that this manual is created to help the project proponent and consultant in the preparation of the EIA report, and it also has, like the regulatory authority to how they can review the report and as well as inform the public about various environmental issues. So, with this manual, they are not only helping the proponent to prepare the reports but also the authority to guide them on how the review has to take place at the same time also inform the public about what to expect, what range of problems one project or highway project might bring in. This EIA guideline and the manual addresses related environmental concerns for specific sectors. So, you see a lot of manuals there.

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Environmental Impact Assessment Guidance Manual for Highways, 2010



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Link:

- http://environmentclearance.nic.in/writereaddata/form-1a/home/links/highways-10_may.pdf

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So, this one consists of 12 chapters considering to generic structure as per EIA notification. So, you can see the EIA manual here, which you can see, what kind of general information for the highway project has to be given and then the environmental clearance process and what kind of terms of reference would be there and

what will be the validity of the environmental clearance, you would look at project description, analysis of alternatives, how the alternatives have to be seen, what kind of considerations have to be taken and how you set up the baseline study description of the environment.

Then you are going to look at the potential impact and then how environmental monitoring program the EMP, what kind of impact is happening and how you are going to mitigate those, and what extra studies you would undertake. So, you see this manual is available for highway and the link is also provided to you for further if you wish to download and see that.

Annexure 8 Highway Projects in Hilly Areas - Checklist for Erosion Control

Does the road construction projects estimate provide for the necessary measure against soil erosion?

Have soil maps and aerial photographs studies and investigations been made to locate areas or sections with high erosion potential?

Has erosion potential been considered for each alignment?

Have geological maps been studied or local geological department consulted to avoid unstable strata? Does the selected alignment follow the lie of the land and avoid large-scale cutting?

Has use of tunnels to avoid deep cuts been investigated?

Is the road alignment respect to damage/erosion by streams and torrents?

Is consultation/co-ordination with other departments like forest department necessary? If so, have they been consulted?

How will adjacent and nearby streams, ponds and lakes be affected by project construction?

Does the road cross section involve a lot of disturbance to the natural ground?

Are the design cut slopes stable for the type of strata?

Are slope-stabilizing structures like breast walls, pitching etc. required?

Does the cut hill face require any special treatment to prevent slips?

Has the area of clearing and grubbing been clearly demarcated?

Has a work schedule been worked out for the different construction operations?

What erosion control works are required before clearing and other works are started?

Are any temporary erosion control measures required between successive construction stages?

Have settlement traps, benches, catch water drains, ditch paving, slope protection works and other erosion control items been identified on the plans and provide in the proposals?

Have the location and alignment of culverts been fixed with due consideration to erosion at outlets and siltation at inlets?

Have the necessary erosion control measures been taken at the outfalls of culverts?

Has the proper disposal of surplus excavated material been thought of and provided for?

Do any of the design measures require modification in the light of field conditions?

(Source: Hill Road Manual: IRC: SP-48-1998)

(EIA Guidance Manual – Highways, 2010, Pg. 73)

Annexure 9 General Standards for Discharge of Effluents

Sl. No.	Parameter	Standards			
		Inland surface water (a)	Public sewers (b)	Land for irrigation (c)	Marine coastal areas (d)
1	Colour (color)	—	—	—	—
2	Suspended solids mg/l Max.	100	400	100	1. For process water 100 2. For cooling water effluent 10% above total suspended matter of effluent
3	Particle size of suspended solids	Shall pass 800 Micron IS sieve	—	—	1. Filterable solids max. 3 mm 2. Sedimentable solids max. 60 microns
4	pH Value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
5	Temperature	Shall not exceed 3°C above the receiving water temperature	—	—	Shall not exceed 3°C above the receiving water temperature
6	Oil and grease mg/l Max.	10	20	10	20
7	Total residual chlorine mg/l Max.	1.0	—	—	1.0
8	Ammonical Nitrogen as N ₂ mg/l Max.	10	10	—	50
9	Total residual nitrogen as NH ₃ mg/l Max.	100	—	—	100
10	Free ammonia as NH ₃ mg/l Max.	5.0	—	—	5.0
11	Bio-chemical oxygen demand (5 days at 20°C) mg/l max.	30	100	100	100
12	Chemical oxygen demand mg/l max.	250	—	—	250
13	Arsonic acid as As ₂ O ₃ mg/l max.	0.2	0.2	0.2	0.2
14	Mercury as HgO mg/l max.	0.01	0.01	—	0.01
15	Lead as PbO mg/l max.	0.1	1.0	—	2.0
16	Cadmium as CdO mg/l max.	2.0	1.0	—	2.0
17	Hexavalent chromium as CrO ₃ mg/l max.	1.0	2.0	—	1.0

(EIA Guidance Manual – Highways, 2010, Pg. 74)

Annexure 11 Indian Road Congress Code of Practices for Highway Projects

S.No.	Subject matter related to recommended code of practices	IRC Code
1.	Hill Road Manual	IRC: SP-48-1998
2.	Recommendations for Road Construction in Waterlogged Areas	IRC: 34-1970
3.	Guidelines for use of Fly Ash in Road Embankments	IRC: SP: 58-2001
4.	Ribbon development along Highways and its prevention	IRC: SP: 15-1996
5.	Guidelines for Environmental Impact Assessment of Highway Projects	IRC: 104-1988
6.	Guidelines on Road Drainage	IRC: SP: 42-1994
7.	Report containing recommendations of the IRC regional workshops on Highway Safety	IRC: SP: 27-1984
8.	Recommended practice for Borrow pits for Road Embankments constructed by Manual operation	IRC: 10-1961
9.	Road accident Forms	IRC: 53-1982
10.	Proceedings of International Seminar on sustainable development in Road Transport	8.10.2001
11.	Highway Safety Code	IRC: SP: 44-1996
12.	Guidelines for Pedestrian Facilities	IRC: 103-1988
13.	Guidelines on Safety in Road Construction Zones	IRC: SP: 55-2001
14.	Recommended practice for treatment of embankment slopes for erosion control	IRC: 36 – 1974
15.	Guidelines on bulk bitumen transportation and storage equipment	IRC: SP: 39
16.	Manual on landscaping of roads	IRC: SP: 21 – 1979
17.	Road safety for children	IRC: SP: 32 – 1988

(EIA Guidance Manual – Highways, 2010, Pg. 80)

Annexure 12
International Good Practices

International Good Practices

It also provided collections of 'good practice' guidelines, technical circulars, and policies, manuals, specifications to address environment issues

These are grouped into:

1. Planning and design
2. Construction management aspects
3. Management of sensitive receptors

(EIA Guidance Manual – Highways, 2010, Pg. 81)

Following boxes include compendium of 'good practice' guidelines, technical circulars, and policies, manuals, specifications etc., developed by road agencies and sectoral ministries to address environment issues. These are grouped into: 1. Planning and design 2. Construction management aspects and 3. Management of sensitive receptors.

1. Planning and Design of Roads

These manuals provide useful alternatives that can be adapted to develop cost effective solutions for Indian roads. Issuing authority: Department of Main Roads, Queensland government, Australia

- › Road traffic noise management, 2000
- › Road landscape manual, 1997
- › Roads in the wet tropics, 1988
- › Road drainage design manual, 2002
- › Guidelines for the treatment of noise & vibration in national road schemes, 2004. The guidelines are being validated and are still to become a final document
- › Road runoff & drainage environmental impact and management options, 2009. Issuing authority: Austroads Inc., Australia
- › A guide to best practices for achieving context sensitive solutions, 2002. NCHRP Report 488

2. Construction Management Aspects

- › Implementation of site safety cycle and provision of welfare facilities for workers at construction sites, 2002. The circular focuses on site safety
- › Additional measures to improve site cleanliness and control mosquito breeding on construction sites, 2003. This carries measures to improve the hygiene surrounding a construction site with a wider responsibility on public work contractors
- › Management of construction & demolition material including rock, 2002. The circular focuses on the reuse of waste material and encourages onsite sorting of construction and demolition related waste material
- › Tailored specifications for site cleanliness and safety, 2002
- › Waste management on construction site, 2003. This circular is meant for urban solid waste management during construction. It recommends sorting of material and is therefore relevant to the transport sector
- › Role of department safety and environmental advisor on health, safety and environmental protection on construction sites, 2003. This circular along with the implementation of site safety (circular mentioned above) provide useful inputs towards developing comprehensive safety documents covering implementation. Issuing authority: Environment, transport & works bureau, Govt. Secretariat, Hong Kong


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So, this manual provides you with other like, it also gives you the checklist, and it also gives you the general standards for discharge of effluence. And then it also gives you a Code of Practice for highway projects. So, what you are going to refer to and it also guides people about international good practices. So, it provides how you have to look at the planning and designing aspect construction management aspect, and how you are going to take care of the sensitive receptors. So, that, all things are provided here.

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India's Guidance Document on Green National Highways Corridor Project

- Provides Environmental Management Framework to deal with Environmental Issues during Planning, Design and Construction of Roads Under the Project



Green National Highways Corridor Project

Environmental Management Framework

A Guidance Document to deal with Environmental Issues during Planning, Design and Construction of Roads Under the Project

Revised Draft Version
November 30, 2019

Ministry of Road Transport and Highways
Government of India

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And you also see that you have a national guidance document on the green national highway corridor project as well. This is provided to deal with the environmental issues during the planning, design, and construction of roads under the project. So, you see the Environmental Management Framework is also provided.

(Refer Slide Time: 19:18)


Botswana's Guidance

Planning and Environmental Impact Assessment of Road Infrastructure

Objective of the Guideline

- to achieve a comprehensive technical basis for decision-making through integrating Environmental Impact Assessments into the planning process

(Therivel, R. and Wood, G., 2018)



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We see that the countries also provide national guidance. So, we can see here, that Botswana provides guidance here in its environmental impact assessment of road infrastructure. This particular guidance gives methodology on how to undertake an environmental impact assessment for the road project. So, you can see here the planning and environmental impact assessment of road infrastructure.

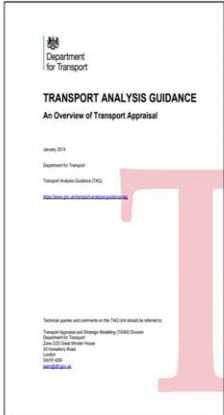
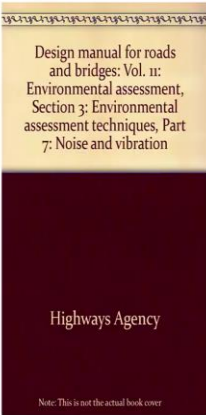
The objective of this guidance is to achieve a comprehensive technical basis for decision-making. So, the decision can be taken based on a comprehensive technical study, and then it would also integrate all the aspects of it and it is taken care of with the due process.

(Refer Slide Time: 20:11)


UK Guidance

- Transport Analysis Guidance
- Design Manual for Roads and Bridges Vol. 11

Link:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936759/tag-overview.pdf

(Therivel, R. and Wood, G., 2018)



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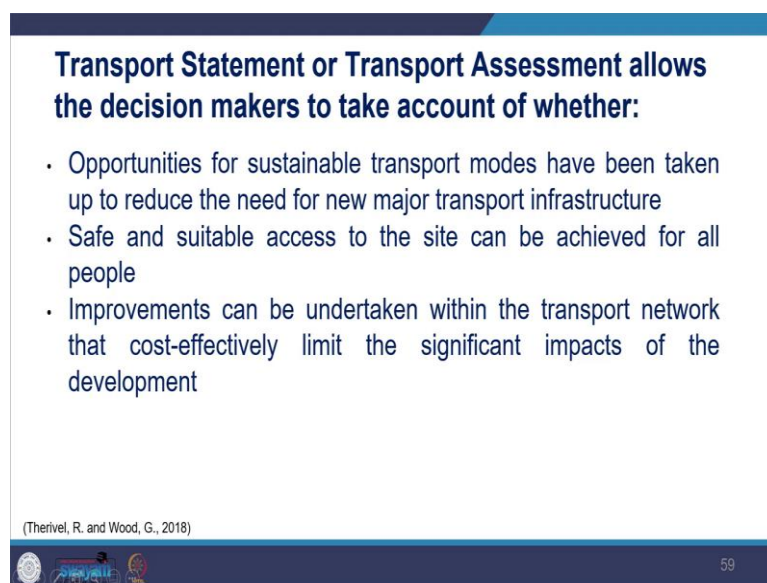
You also see TAG web-based Transport Analysis Guidance, which says the guidance, and as a toolkit, it works this has software tools and it allows you to do transportation modeling here and allows you to review all the methods here. So, those were the only available guidelines.

(Refer Slide Time: 20:38)



Now, we will look at what kind of policies are adopted to reduce transport impacts and improve accessibility. So, you can reflect that, whenever the development projects come, it generates a substantial level of new travel and traffic development, projects of transport, so always there are chances of new travel and traffic arising out of it.

(Refer Slide Time: 21:05)

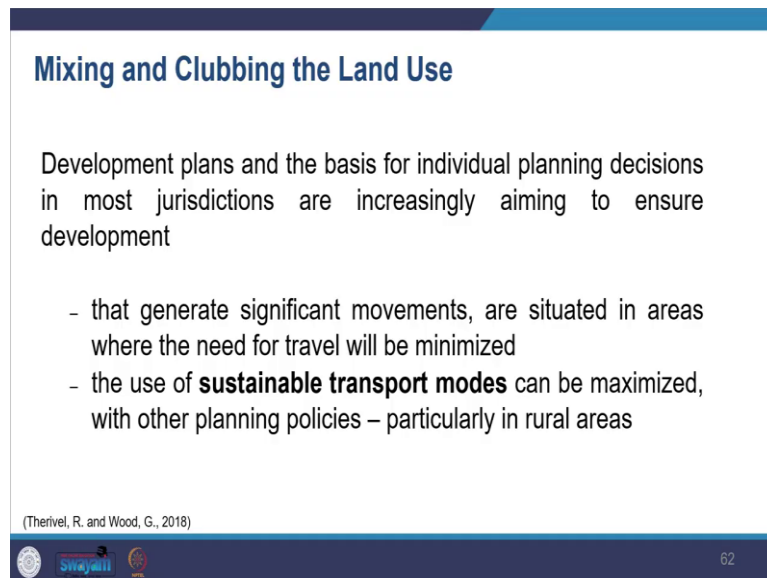


So, these days as a part of good practice across the world, it is a practice to have transport status statements. So, the transport statement is prepared or you have a transport assessment. So, these are done for any kind of project, because certain kinds of impacts are going to happen. So, when these things are prepared, it allows the decision makers the ones who decide whether the project has to come or not.

So, they can make certain decisions and they ensure that, whatever has come up, they have made every effort to make this, they are making every effort, they ensure that, every effort has been made to reduce the need of the project. So, in the first place, one should see that there should be no need for a new project or major infrastructure to come up.

So, they try to review that, those efforts have been made, and then also to see that, the project could have been handled with other means also, but by just not creating a new project safety and suitability are also duly considered. So, they also review that, enough has been checked to see that, mixing and clubbing of land use has been done to minimize the travel demand and then also use has been made of sustainable transport modes. We are seeing that most and most of the jurisdictions these days are making significant moves towards reducing the travel need, and then also looking at the sustainable transport mode.

(Refer Slide Time: 22:54)



Mixing and Clubbing the Land Use

Development plans and the basis for individual planning decisions in most jurisdictions are increasingly aiming to ensure development

- that generate significant movements, are situated in areas where the need for travel will be minimized
- the use of **sustainable transport modes** can be maximized, with other planning policies – particularly in rural areas

(Therivel, R. and Wood, G., 2018)

swajail 62

And that can be done by mixing and clubbing of the land use. And then FA emphasis also put on how to have efficient delivery of goods and supplies and how to prioritize pedestrians and cyclists and then how to give high-quality public transport facilities. So, you must be seeing how comparatively from the previous time you have a better quality of public transportation and then how to create safe and secure layouts and then also you have for the E Vehicles you have enough charging plugins and then you also promote ultra-low emission vehicles. And then you also take care of people with disability and you do not take care and only one mod but you take care of that, and all modes of transport. So, that, was our first part where we dealt with the transportation and then what kind of guidance are there and what kind of references are available to undertake impact evaluation in those areas. So, we are moving into the second part of our lecture today.

(Refer Slide Time: 24:13)

Landscape and Visual

Legislation on Landscape and Visual

US - National Park Service Organic Act, 1916

Act set up National Parks with the purpose to

“conserve the scenery and the natural and historic objectives and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations”

ACT TO ESTABLISH A NATIONAL PARK SERVICE (ORGANIC ACT), 1916

AN ACT TO ESTABLISH A NATIONAL PARK SERVICE,
AND FOR OTHER PURPOSES,
Approved August 25, 1916 (39 Stat. 535)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That there is hereby created in the Department of the Interior a service to be called the National Park Service, which shall be under the charge of a director, who shall be appointed by the Secretary and who shall receive a salary of \$4,500 per annum. There shall also be appointed by the Secretary the following assistants and other employees at the salaries designated: One assistant director, at \$2,500 per annum; one chief clerk, at \$2,000 per annum; one draftsman, at \$1,800 per annum; one messenger, at \$600 per annum; and, in addition thereto, such other employees as the Secretary of the Interior shall deem necessary: *Provided*, That not more than \$8,100 annually shall be expended for salaries of experts, assistants, and employees within the District of Columbia not herein specifically enumerated unless previously authorized by law. The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (U.S.C. title 16, sec. 1.)

Link:
<https://www.nps.gov/learn/management/upload/1916%20ACT%20T0%20ESTABLISH%20A%20NATIONAL%20PARK%20SERVICE-5.pdf>


So, we are going to look at the Landscape and visual part. So, for that, we will look at the legislation components. So, till now the landscape legislation. Till now landscape legislation is normally limited to regulation that, protects landscape designation. So, you see, for example in the US, you will see here that,

the National Park Service, Organic Act of 1916 has set up a National Park and then the purpose of setting up this national park is to conserve this scenery.

Conserve this scenery and the natural and historic objectives and the wildlife they are in and provide for the enjoyment of the same in such a manner and by such means as we will leave them unimpaired, so no kind of damages or damage happens to that, and it allows the enjoyment of the future generation as well. So, you see how even scenery is given importance here.

(Refer Slide Time: 25:14)

UK - National Parks and Access to the Countryside Act, 1949



National Parks and Access to the Countryside Act 1949

1949 CHAPTER 97 12 13 and 14 Geo 6

An Act to make provision for National Parks and the establishment of a National Parks Commission; to confer on the Nature Conservancy and local authorities powers for the establishment and maintenance of nature reserves; to make further provision for the recording, creation, maintenance and improvement of public paths and for securing access to open country, and to amend the law relating to rights of way; to confer further powers for preserving and enhancing natural beauty; and for matters connected with the purposes aforesaid.

[16th December 1949]

Link: <https://www.legislation.gov.uk/ukpga/Geo6/12-13-14/97> (Therivel, R. and Wood, G., 2018)

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So, likewise, we find the UK National Park and Access to the Countryside Act 1949. This Act covers national parks and areas of outstanding natural beauty in the country, where the focus is on the conservation and enhancement of the natural beauty wildlife, and cultural heritage of the landscape. So, this Act makes provisions for the National Park and also makes the establishment of the National Park Commission and then it has assigned them roles and responsibilities it gives them certain powers on how they can take care of it.

(Refer Slide Time: 25:53)

National Parks Act 1980 in New Zealand's

National Parks:

'areas of New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique, or scientifically important that their preservation is in the national interest'

(Therivel, R. and Wood, G., 2018)

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So, we also see the National Park in 1980 in New Zealand. So, where national parks are designated by the act, and they are considered areas of New Zealand that, contain scenery of such distinctive quality and ecological systems or natural features, are so beautiful, unique, and scientifically important that their preservation is in the national interest. So, they highlight their beauty, and then they act to protect those places.

(Refer Slide Time: 26:29)

New Zealand - National Parks Act, 1980

Version as at 28 October 2021

Principles to be applied in national parks

- Parks to be maintained in natural state, and public to have right of entry
- Indigenous plants and animals to be preserved
 - Introduction of biological organisms



National Parks Act 1980

Public Act 1980 No 66
Date of assent 17 December 1980
Commencement see section 1(2)

Note

The Parliamentary Counsel Office has made editorial and format changes to this version using the powers under [subpart 2](#) of Part 3 of the Legislation Act 2019.

Note 4 at the end of this version provides a list of the amendments included in it.

This Act is administered by the Department of Conservation.

Link:

<https://www.legislation.govt.nz/act/public/1980/0066/latest/whole.html#:~:text=It%20is%20hereby%20declared%20that,quality%2C%20ecological%20systems%2C%20or%20natural>

(Therivel, R. and Wood, G., 2018)



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So, according to the provision efforts are made to maintain the park and then also to maintain the indigenous plants, and also look at the biological organisms. So, in India, we see that we do not focus on the landscape. But our prime focus is on wildlife, we see the wildlife protection act 1972, which gave the powers to the central and the state governments to establish protected areas.

So, we have already seen these how we have sanctuaries, National Park conservation reserves, and so on, for protecting the animal and plant species in that, particular region, area, or place. So, if we have not highlighted the core of, the visual or the landscape part, but the at the core of it as the wildlife.

(Refer Slide Time: 27:13)

European Landscape Convention or Florence Convention, 2000

COUNCIL OF EUROPE LANDSCAPE CONVENTION
CONVENTION DU CONSEIL DE L'EUROPE SUR LE PAYSAGE
Drawn by Alberto Floridi

The Convention is aimed at: the protection, management and planning of all landscapes and raising awareness of the value of a living landscape

(Therivel, R. and Wood, G., 2018; Council of Europe, 2022)

79

We also find the European landscape invention, also known as the Florence convention for protection management and planning of the landscapes.

(Refer Slide Time: 27:24)

Guidance on Landscape and Visual

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Further, looking into the guidance on how to undertake that, landscape and visual and further, we will be also looking in the Methods section. So, right now, we are just covering the guidance here.

(Refer Slide Time: 27:34)

United States Guidance on Visual Impact Assessment and Visual Resource Management

- Visual Impact Assessment and Visual Resource Management were developed in the 1970s by the Forest Service and the Department of Transportation, and subsequently the Federal Highway Administration
- The Forest Design Service set the standard for integration of aesthetic considerations in large-scale resource management decisions


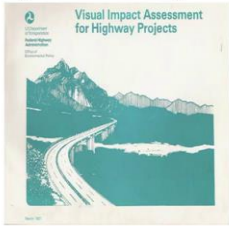


Figure 2. Cover of the 1983 version of FHWA's VEA guidance. Source: FHWA.

(Therivel, R. and Wood, G., 2018)

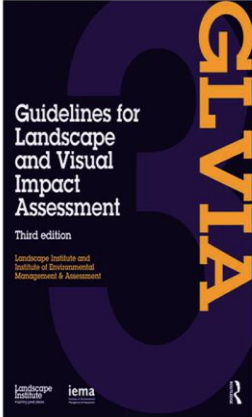
Link: <https://www.nrc.gov/docs/ML1224/ML12241A377.pdf>

So, you have guidance related, you see that, the Forest Service and Department of Transportation, which is now known as Federal Highway Administration in the USA has developed visual impact assessment and visual resource management. It was created and developed in the 1970s. So, you find them that, these guidelines are available. So, if you are interested in doing that, or you are nearly required to do that, then you can refer to these. We also find standards by Forest Design Services, which gives standards for the integration of aesthetic consideration in large-scale resource management decisions. So, what standards have to be followed?

(Refer Slide Time: 28:21)

Key source of guidance in the UK

This provides guidelines to achieve consistency, credibility and effectiveness in landscape and visual impact assessment



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(Therivel, R. and Wood, G., 2018)

Link: <https://www.routledge.com/Guidelines-for-Landscape-and-Visual-Impact-Assessment/Institute-IEMA/p/book/9780415680042>

And then we also see guidance in the UK, where you have landscape Institute and institution of environmental management and assessment guidelines. These guidelines are for landscape and visual impact assessment. So, here, it provides guidelines on how to achieve consistency, credibility, and effectiveness in landscape and visual impact assessments. So, this is also available and I have also given you the link for downloading purposes and you can look at the table of contents.

(Refer Slide Time: 28:50)

Landscape and Visual Impact Assessment

By UK Landscape Institute (2011)

Guidelines for Landscape and Visual Impact Assessment
Third edition

Landscape Institute
Institute of Environmental Management and Assessment

Landscape Institute (2011) *Photography and photomontage in landscape and visual impact assessment*, Advice Note 01/11, London: Landscape Institute.

Photographs and visualisations

8.15 [FIGURE 8.2A-B] Photographs can have an important role to play in communicating information about the landscape and the visual effects of a proposed development, although it is acknowledged that they cannot convey exactly the way that the effects would appear on site. In dealing with **landscape effects** photographs should be included in the Environmental Statement to illustrate the landscape character of the site and its context. It is not possible to include photographs of every part of every different landscape and so photographs should be selected to illustrate a representative range of landscape character types or areas and some of their important key characteristics. When incorporating photographs the following points should be considered.

Link: <https://www.northumberland.gov.uk/NorthumberlandCountyCouncil/media/Planning-and-Building/Planning%20Inquiries/H4-GLVIA3-3rd-Edition-APP-P2935.pdf>

Photomontage

8.18 Photomontage is the most widespread and popular visualisation technique for illustrating changes in views and visual amenity. A photomontage is the superimposition of an image onto a photograph for the purpose of creating a representation of potential changes to any view. Its main advantage is that it can illustrate the development within the 'real' landscape and from known viewpoints. The Landscape Institute has provided comprehensive guidance on this subject, noting that:

'The objective of a photomontage is to simulate the likely visual changes that would result from a proposed development, and to produce printed images of a size and resolution sufficient to match the perspective in the same view in the field.'

(Landscape Institute, 2011)

(Therivel, R. and Wood, G., 2018)

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Then you also find advice notes on photography and photomontage in landscape and visual impact assessments. So, how by photography and photomontage you can undertake your landscape and visual impact assessment? So, you also see Hong Kong Environmental Protection Department has also developed guidance on landscape and Visual Impact assessment.

(Refer Slide Time: 29:13)

Guidance on Visual Simulations

BEST PRACTICE GUIDE
VISUAL SIMULATIONS BPG 10.2

Prepared by New Zealand Institute of Landscape Architects

Link: https://hzila.co.nz/media/uploads/2017_01/vissim_bpg102_jo_wfinal.pdf

(Therivel, R. and Wood, G., 2018)

90

Then, you also see New Zealand Institute of Landscape Architects has prepared similar guidelines for visual simulation so you can do simulations and see the purpose of this guideline is to promote best practice standards and procedures and preparation and use of visual simulation by landscape professionals. So, you can see here how it allows us to see the existing stimulated view and then as built viewed through this practice guidance.

(Refer Slide Time: 29:43)

Landscape in IFC's - Performance Standard 6

Biodiversity Conservation and Natural Resources

International Finance Corporation
WORLD BANK GROUP
Creating Markets, Creating Opportunities

Sustainability » Policies & Standards » ESG Performance Standards

Performance Standard 6

The Business Case for Sustainability | ESG Resources for Companies | **Policies & Standards** | Publications | News | Contacts

Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012)

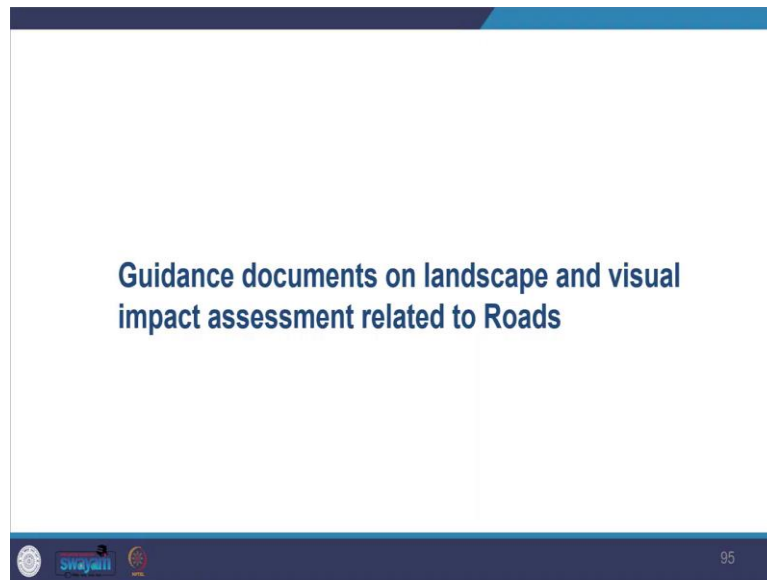
Biodiversity loss can result in critical reductions in the resources provided by the earth's ecosystems, which contribute to economic prosperity and human development. This is especially relevant in developing countries where natural resource-based livelihoods are often prevalent. PS6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and managing living natural resources adequately are fundamental to sustainable development.

Link:
https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards/ps6 (Therivel, R. and Wood, G., 2018)

92

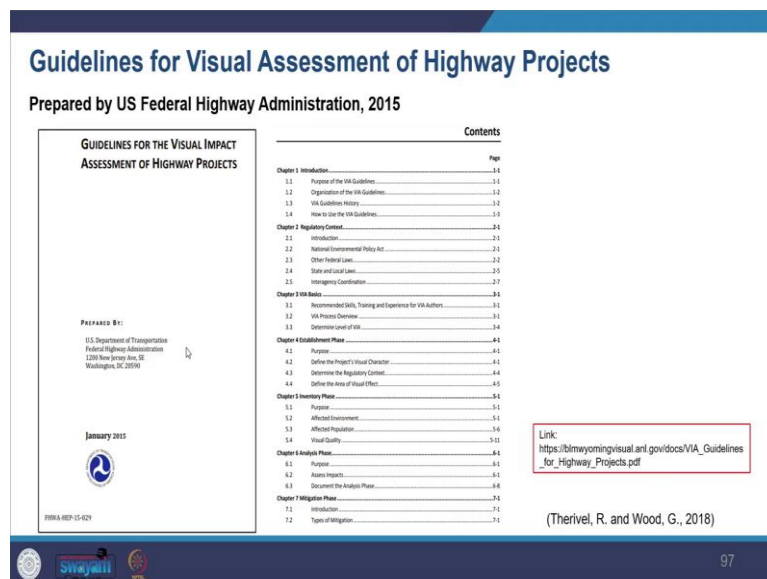
Then you also find the IFC standard. They also emphasize the significance of landscape and it is covered under performance standard six under Biodiversity Conservation and Natural Resources. So, you can find these here as well. And then it is PS6 lays, lays importance gives importance to the landscape. And it has certain points like for certain projects, values are assigned for these biodiversity and ecosystem services, which we have already discussed. So, I am going to not cover a detail here.

(Refer Slide Time: 30:24)



We also find another guidance document on landscape and visual impact assessment related to specific types of developments such as roads and renewable energy. So, let us look at the guidance document on landscape and visual impact assessment related to roads. So, we are going to just quickly look at some of the examples, and documents that are there, these are Sectoral-specific guidelines, which are there.

(Refer Slide Time: 30:58)



So, you have for roads you have used US Federal Highway Administration has developed a guideline for your visual assessment of highway projects. So, I have also given you the link here. You can see the table of contents where you can see what kind of regulatory context is there, what basics are there, what kind of different phases would be there, and what you are supposed to undertake in those phases.

(Refer Slide Time: 31:25)

Evaluation of Methodologies for Visual Impact Assessment

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP REPORT 741

Evaluation of Methodologies for Visual Impact Assessments

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Ann Arbor, MI

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TRANSPORTATION RESEARCH BOARD

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Prepared by US National Cooperative Highway Research Program's (2012)

Link: <https://www.nap.edu/catalog/22644/evaluation-of-methodologies-for-visual-impact-assessments>

(Therivel, R. and Wood, G., 2018)

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So, you also find with regards to roads, find US National Cooperative Highway Research Program has also developed evaluation methodologies for visual impact assessments. So, you can also find different kinds of visual impact assessments.

(Refer Slide Time: 31:38)

UK (former) Department of Transport's Design Manual for Roads and Bridges index (1993)

UK Department for Transport's Transport Analysis Guidance: WebTAG (DfT 2013)

Guidance

Transport analysis guidance

Transport analysis guidance (TAG) provides information on the role of transport modelling and appraisal.

From: [Department for Transport](#)

Published 29 October 2013

Last updated 13 October 2021 — [See all updates](#)

Link: <https://www.gov.uk/guidance/transport-analysis-guidance-tag#contents>

This content contains guidance on the conduct of transport studies

The guidance includes or provides links to advice on how to:

- set objectives and identify problems
- develop potential solutions
- create a transport model for the appraisal of the alternative solutions
- how to conduct an appraisal that meets the requirements of the Department for Transport (DfT)

(Therivel, R. and Wood, G., 2018)

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In the UK you see that the Department of Transport design manual for roads and bridges in the index is available, you also see web TAG by the UK Department of Transport. This guidance includes and provides links to advice on how to set objectives and identify problems, how to develop potential solutions and create a transport model for appraisal of alternative solutions. So, how you can evaluate the solutions also, and how you can conduct an appraisal that, meets the requirements of the Trans Department of Transport? So, you can see here, that these are all available guidelines for the purpose. And then you see New South Wales.

(Refer Slide Time: 32:30)

New South Wales (Australia) Roads and Maritime Service's (2020) Guideline for Landscape Character and Visual Impact Assessment

- *This document has been prepared to guide the preparation of landscape character and visual impact assessments for road and maritime work in accordance with Beyond the Pavement*
- *It relates to broader planning and design exercises and environmental assessment investigations which are undertaken iteratively to inform project teams about the effects of a proposal and it informs environmental approval processes defined by the Environmental Planning and Assessment Act 1979 (EP&A Act)*

Link: <https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/guideline-landscape-character-and-visual-impact.pdf>

(Therivel, R. and Wood, G., 2018)

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Roads and Maritime Services also provides guidelines for landscape character and visual impact assessment. And this document the purpose of this document is to guide the preparation of landscape character and visual impact assessment for road and maritime work.

(Refer Slide Time: 32:51)

Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy in 2015

OBJECTIVES

- To evolve a policy framework for plantation along National Highways;
- To reduce the impact of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants;
- To provide much needed shade on glaring hot roads during summer;
- To reduce the impact of ever increasing noise pollution caused due to increase in number of vehicles;
- To arrest soil erosion at the embankment slopes;
- To prevent glare from the headlight of incoming vehicles; .
- To moderate the effect of wind and incoming radiation;
- To create employment opportunities for local people;

(Megforest, 2015)

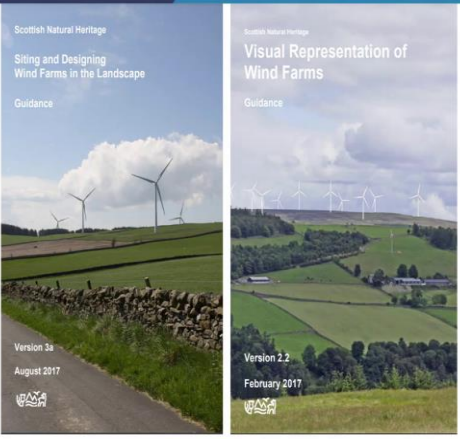
110

We see that the Indian government has also launched its Green Highway Plantation Transplantation Beautification and Maintenance policy in 2015. The policies aim to help the environment help local communities and generate employment by planting trees along all the highways in the country must have noticed while traveling the kind of change that has come up.

(Refer Slide Time: 33:16)

Guidance documents on landscape and visual impact assessment related to Renewable energy

- **Guidelines on the Environmental Impacts of Wind Farms and Small Scale Hydroelectric Schemes, 2001**
- **Guidance on the Siting and Designing Wind Farms In The Landscape, 2017**
- **Guidance on Visual Representation of Wind Farms, 2017**



(Therivel, R. and Wood, G., 2018)

<https://www.nature.scot/sites/default/files/2017-11/Siting%20and%20designing%20windfarms%20in%20the%20landscape%20-%20version%203a.pdf>

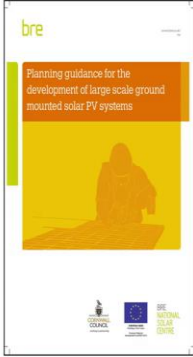
<https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf>

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So, now looking at the guidance document on landscape and visual impact assessment related to renewable energy. So, you see, the Scottish Natural Heritage guidelines are there. It provides guidelines on the environmental impacts of wind farms and small-scale hydroelectric schemes. Then you also find the guidance on citing and designing wind farms and then you also find guidance on visual representation of wind farms.

(Refer Slide Time: 33:52)

BRE's Planning Guidance for the development of large-scale ground mounted solar PV systems, 2013



https://www.bre.co.uk/filelibrary/pdf/other_pdfs/KN5524_Planning_Guidance_reduced.pdf


- Rising energy costs and the support of the Feed in Tariff (FiT) and the Renewable Obligations Certificates have significantly increased the financial viability and attractiveness of installing solar PV panels
- These installations may be roof / wall mounted or standalone / ground mounted
- **This national guidance provides best practice planning guidance in respect of how large ground mounted arrays are developed setting out planning considerations and requirements**

(Therivel, R. and Wood, G., 2018)

Then you also see planning guidance for the development of large-scale ground-mounted Solar PV systems. So, those are also provided. I have given you the link as well.

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Northern Ireland Environment Agency's guidance Wind Energy Developments, 2010



https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/Wind%20Energy%20Development%20in%20Northern%20Ireland%20Landscapes_0.pdf

4.4 Assessment of Landscape and Visual Impacts

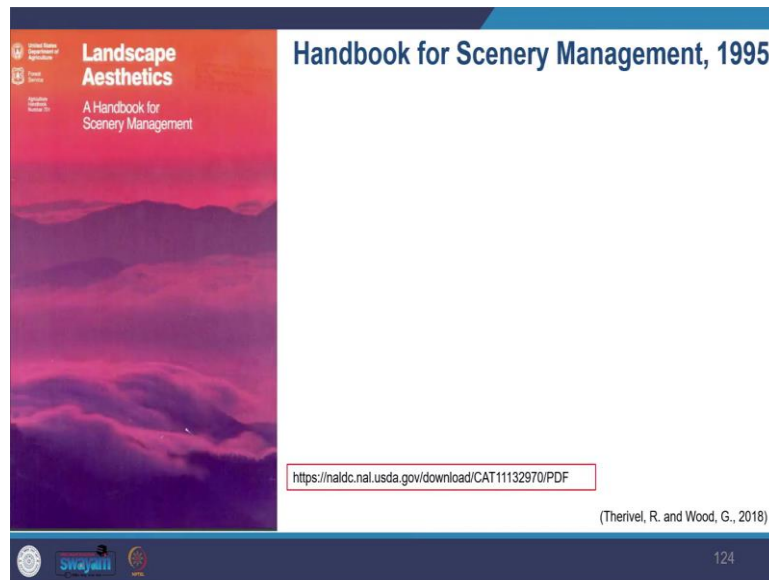
For most wind energy developments, submission of an Environmental Impact Assessment (EIA) will be required. For smaller developments that do not require a full EIA the planning authority will often still require information describing environmental impacts and how they have been addressed. An assessment of landscape and visual impact will normally be a central part of the EIA for wind energy developments; key good practice requirements for landscape and visual impact assessment (LVIA) are summarised in Table 6. Definitions of LVIA terms can be found in Annex 2. Further advice on LVIA can be found in Landscape Institute and Institute of Environmental Management and Assessment (2002) *Guidelines for Landscape and Visual Impact Assessment*, 2nd edition, Spon.

- This supplementary planning guidance is intended to provide broad, strategic guidance in relation to the landscape and visual impacts of wind energy development.
- Every development proposal is unique, and there remains a need for detailed consideration of the landscape and visual impacts of individual applications on a case by case basis, as well as for consideration of other issues referred to in PPS18 and other regional policy

(Therivel, R. and Wood, G., 2018)

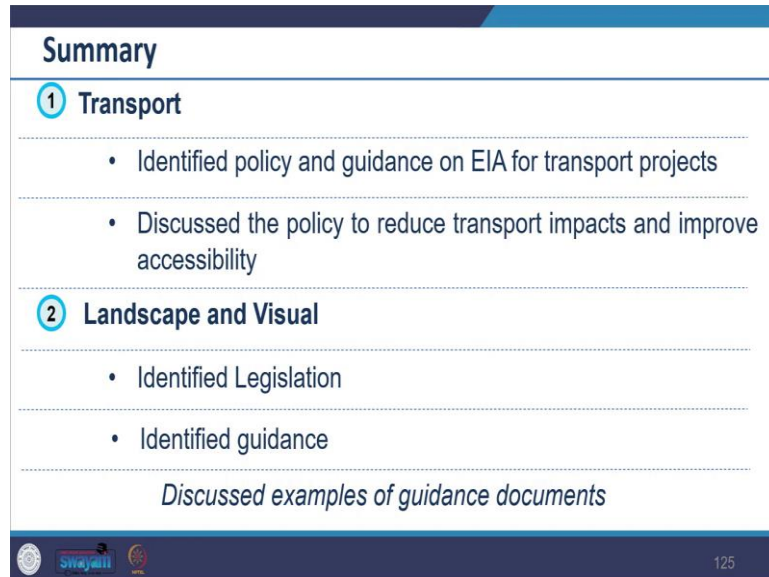
Then you also see Northern Ireland environmental agency has also developed a guidance on wind energy development, which includes a section on landscape and visual impact assessment. And then you also find supplementary planning guidance on wind energy which is developed by Northern Ireland landscape companies. So, you can see here.

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Then you also see US Department of Agriculture Forest Service has also developed a handbook for scenery management. The scenery management system is a tool for integrating the benefits, values, desires, and preferences regarding aesthetics and scenery for all levels of land management planning. So, alright, we will end here. So, this was about the landscape and visual impact assessment. So, summarizing what we covered today.

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So, we looked at the transport sector, we looked at the policies and guidelines which are there and then we also looked at the policies generally adopted for reducing the impact of transportation and then to improve the accessibility path. Then we looked at landscape and visuals and then we identified various legislations and then we also looked at various guidance. And then we also looked at some Sectoral-specific guidance on how to take care of, and how to conduct landscape and visual assessment.

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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 **Therivel, R., & Wood, G. (2018). Methods of Environmental and Social Impact Assessment.**
<https://lcn.lccn.gov/2017010184>
- 3 **Environmental Impact Assessment Guidance Manual for Highways, 2010**
http://environmentclearance.nic.in/writereaddata/form-1a/homelinks/highways-10_may.pdf
- 4 **India's Guidance Document on Green National Highways Corridor Project**
<https://documents1.worldbank.org/curated/en/214931577448618247/pdf/Environmental-Management-Framework-A-Guidance-Documents-to-deal-with-Environmental-Issues-during-Planning-Design-and-Construction-of-Roads-Under-the-Project.pdf>


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So, these were the references for today.

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Suggested Watch and Read




https://www.youtube.com/watch?v=Uxh3MxOvD&ab_channel=TheHindu



https://www.youtube.com/watch?v=77FibelaChQM&ab_channel=WTG







https://www.youtube.com/watch?v=9Gh8d_WFTQ



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These are the suggested watch and read so you can look at more of the literature and videos in this regard.

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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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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. Thank you.