

Use of the Action Impact Matrix (AIM) to analyse Climate Change linkages with Sustainable Development

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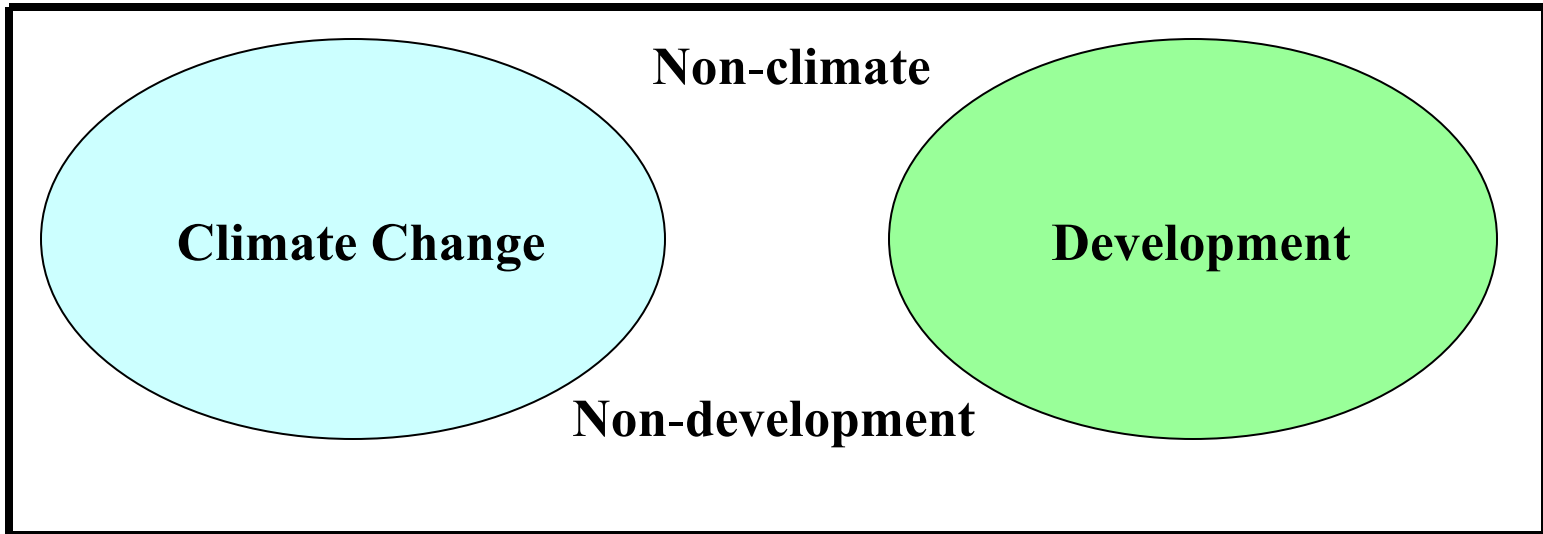
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Tracing the Two-way Links Between Climate Change and Sustainable Development

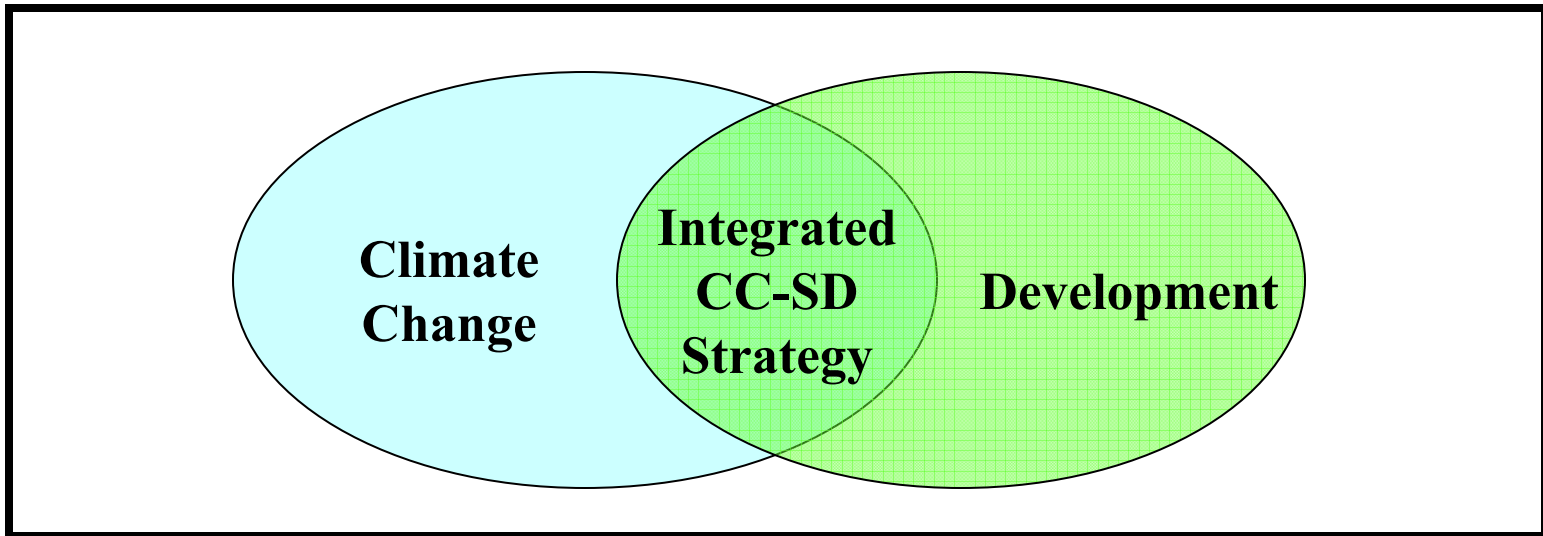
CC → SD

SD → CC





Former Viewpoint – AR1



Desirable Viewpoint (policy relevant) – AR4



Concluding Thoughts on Climate Change and Sustainable Development

- CC policies must be integrated within overall national SD strategy**
- Adaptation and vulnerability reduction is critical for developing countries (avoid adverse CC impacts)**



ADAPTATION AIM



Matrix AED

Effects of key VA areas on development goals and policies

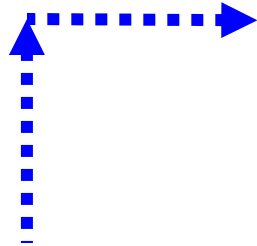
		Vulnerability & Adaptation (VA) Areas		
		Economic	Environmental	Social
	
<u>Dev. Goals/Policies</u>				
(A)			
(B)			
(C)			
(D)			



Matrix DEA

Effects of development goals and policies on key VA areas

		Vulnerability & Adaptation (VA) Areas		
		Economic	Environmental	Social
	
<u>Dev. Goals/Policies</u>				
(A)			
(B)			
(C)			
(D)			



AIM methodology

- 1. Determine the most important national goals & policies**
2. Determine critical vulnerability and adaptation (VA) areas relevant to climate change.
3. Determine status of VA areas subject to only natural climate variability
4. Determine impacts of climate change on VA areas
5. Identify how goals/policies might affect VA areas.
6. Identify how VA areas might affect goals/policies.
7. Prioritize most important interactions and determine appropriate remedial policies and measures
8. Perform more detailed studies and analysis of key interactions and policy options identified above.



Make a list of possible Row Headings and give description

Country Specific Sustainable Development Goals and Policies

Example: Growth

Description:

One of the major objectives of the government is to increase the rate of economic growth, and thereby eliminate poverty. In order to obtain a high growth rate a sound macroeconomic foundation is necessary. According to the policy document of the present government it expects 6 – 8 percent growth rate in next five years.



AIM methodology

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Make a list of possible Column Headings

Key VA areas relevant to climate change

Examples: Economic - *Agricultural Activity*

Social - *Health*

Environmental - *Water Resources*



Insert prioritized variables into column (1-5) and row (A-F) heading areas highlighted

		Vulnerability & Adaptation (VA) Areas								
		Eco n1	Eco n2	Eco n3	Env 1	Env 2	Env 3	Soc 1	Soc 2	Soc 3
		Agr outp ut			Wate r Res.			Healt h		
<u>Dev. Goals/Policies</u>										
(A)	Growth									
(B)										
(C)										
(D)										
(E)										
(F)										



Filling in the Cells of the Adaptation AIM

Each cell is assigned a value according to the following guidelines:

Scoring Key

- 3 = High negative (undesirable) impact/effect
- 2 = Medium negative (undesirable) impact/effect
- 1 = Low negative (undesirable) impact/effect
- 0 = No impact/effect
- 1 = Low positive (desirable) impact/effect
- 2 = Medium positive (desirable) impact/effect
- 3 = High positive (desirable) impact/effect



AIM methodology

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Incorporating the impacts of climate change into the Adaptation AIM

Insert values of S0 into cells

	Vulnerable and adaptation (VA) areas			
	Economic		Environmental	Social
	(1) Agricultural output	(2) Industrial Activity	(3) Water Resources	(4) Health
	<u>(S0) Status (only natural variability)</u>	-1		



In a parallel matrix, we need to include the reasoning behind the values given for S0

	Vulnerable and adaptation (VA) areas			
	Economic		Environmental	Social
	(1) Agricultural output	(2) Industrial Activity	(3) Water Resources	(4) Health
	<u>(S0) Status</u> <i>(only natural variability)</i>	-1: Agricultural output seems to be decreasing		



AIM methodology

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- 4. Determine impacts of climate change on VA areas**
5. Identify how goals/policies might affect VA areas.
6. Identify how VA areas might affect goals/policies.
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Incorporating the impacts of climate change into the Adaptation AIM

Insert values of S1 into cells

	Vulnerable and adaptation (VA) areas			
	Economic		Environmental	Social
	(1) Agricultural output	(2) Industrial Activity	(3) Water Res	(4) Health
<u>(S0) Status (only natural variability)</u>				
(S1) Status (with climate change)	-2			



In a parallel matrix, we need to include the reasoning behind the values given to each cell

	Vulnerable and adaptation (VA) areas			
	Economic		Environmental	Social
	(1) Agricultural output	(2) Industrial Activity	(3) Water Res	(4) Health
<u>(S0) Status (only natural variability)</u>				
(S1) Status (with climate change)	[-2]Agricultural output in the tropics, is likely to decrease with changing weather patterns and increase in temperatures			



AIM methodology

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- 5. Identify how VA areas might affect goals/policies.**
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Matrix AED : Insert values into the cells

		Vulnerable and Adaptation (VA) Areas			
		Economic		Environmental	Social
		(1) Agricultural output	(2) Industrial Activity	(3) Water Resources	(4) Health
(S0) Status (only natural variability)		-1			
(S1) Status (with climate change)		<u>-2</u>			
<u>Dev. Goals/Policies</u>					
(A)	Growth	-2			
(B)	Poverty alleviation	-3			
(C)	Food Security	-2			
(D)	Employment	-1			



Matrix AED:

Text description of reasons for numerical values assigned.

Example

Cell A1: [-2] Loss:

A decrease in agricultural output due to climate change, would have a moderate negative impact on growth by decreasing the income from agricultural produce, and increasing food imports.



AIM methodology

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- 6. Identify how goals/policies might affect VA areas.**
7. Prioritize most important interactions and determine appropriate remedial policies and measures
8. Perform more detailed studies and analysis of key interactions and policy options identified above.



Matrix DEA: Insert values into the cells

		Vulnerable and Adaptation (VA) Areas			
		Economic		Environmental	Social
		(1) Agricultural output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (only natural variability)</u>		-1			
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1			
(B)	Poverty alleviation				
(C)	Food Security	+1			
(D)	Employment				



Matrix DEA:

Text description of reasons for numerical values assigned.

Example

Cell A1:[-1] Loss:

Growth would have a negative effect on agriculture due to increased industrial activity



AIM methodology

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8. Perform more detailed studies and analysis of key interactions and policy options identified above.



Analysing Matrix AED

Highlighting the most harmful linkages

		Vulnerable and adaptation (VA) areas			
		Economic		Environment al	Social
		(1) Agric. output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (only natural variability)</u>		-1			
<u>(S1) Status (with climate change)</u>		<u>-2</u>			
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1			
(B)	Poverty alleviation	-2		-3	
(C)	Food Security	-2			
(D)	Employment	-1			



Analysing Matrix DEA

Highlighting the most harmful linkages

		Vulnerable and adaptation (VA) areas			
		Economic		Environmental	Social
		(1) Agric. output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (only natural variability)</u>					
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1	+2	-3	+1
(B)	Poverty alleviation				
(C)	Food Security				
(D)	Employment				
<u>(S1) Status (with climate change)</u>		<u>-2</u>	+1	-2	-1



Analysing Matrix AED

Highlighting significant rows and columns

		Vulnerable and adaptation (VA) areas			
		Economic		Environmen tal	Social
		(1) Agric. output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (only natural variability)</u>		-1	2		
<u>(S1) Status (with climate change)</u>		<u>-2</u>	-1		
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1	-1	-2	-1
(B)	Poverty alleviation	-2	+1	-2	-2
(C)	Food Security	-2	-1	-3	-1
(D)	Employment	-1	+1	-2	-2



Analysing Matrix DEA

Highlighting significant rows and columns

		Vulnerable and adaptation (VA) areas			
		Economic		Environmenta I	Social
		(1) Agric. output	(2) Industrial Activity	(3) Water Resources	(4) Health
		<u>(S0) Status (only natural variability)</u>			
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1	+2	-1	+1
(B)	Poverty alleviation	+1	+1	+1	+2
(C)	Food Security	+2	-1	-2	+2
(D)	Employment	-2	+2		+2
<u>(S1) Status (with climate change)</u>		-2	+1	-2	-2

AIM methodology

1. Determine the most important national goals & policies
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Matrix AED

Policy Options and Areas for Further Study

		Vulnerable and Adaptation (VA) Areas			
		Economic		Environmenta I	Social
		(1) Agricult. output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (only natural variability)</u>		-1	2		
<u>(S1) Status (with climate change)</u>		<u>-2</u>	-1		
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1	-1	-2	-1
(B)	Poverty alleviation	-2	+1	-2	-2
(C)	Food Security	-2	-1	-3	-1
(D)	Employment	-1	+1	-2	-2

Matrix DEA

Policy Options and Areas for Further Study

		Vulnerable and Adaptation (VA) Areas			
		Economic		Environmental	Social
		(1) Agricultural output	(2) Industrial Activity	(3) Water Resources	(4) Health
<u>(S0) Status (without climate change)</u>					
<u>Dev. Goals/Policies</u>					
(A)	Growth	-1	+2	-3	+1
(B)	Poverty alleviation	+1	+1	-1	+2
(C)	Food Security	+2	-1	-1	+2
(D)	Employment	-2	+2		+2



Recommendations from Sri Lanka Workshop



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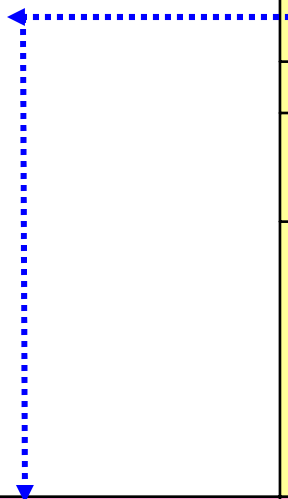
Options for Adaptation

**MIND-C3D Training Workshop on
Climate Change and Sustainable Development
30 May – 2 June 2005, Trans Asia Hotel,
Colombo**



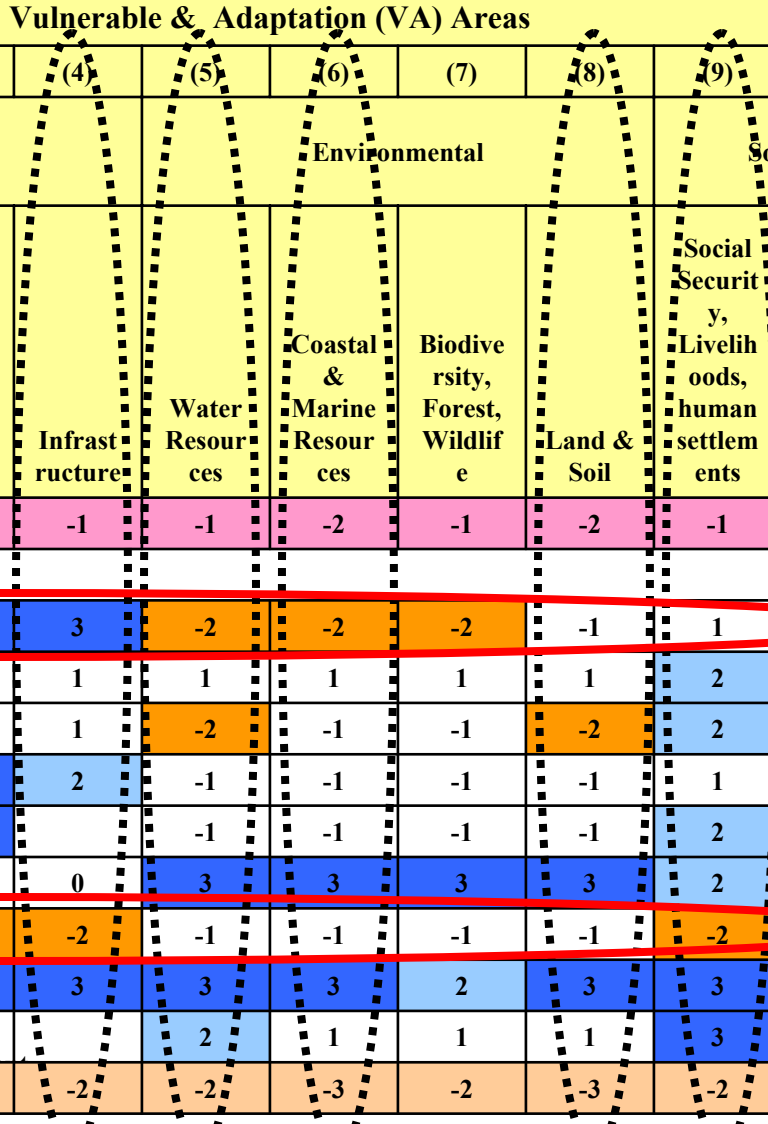
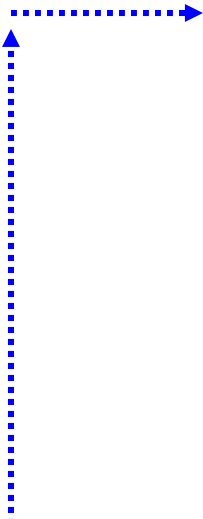
Adaptation Effects on Development (AED-AIM): SL - CC Impacts and Effects of VIA Areas on Development Goals/Policies

		Vulnerable & Adaptation (VA) Areas									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Economic				Environmental				Social	
		Agr Output	Fishery Production	Trade and Industry, Tourism	Infrastructure	Water Resources	Coastal & Marine Resources	Biodiversity, Forest, Wildlife	Land & Soil	Social Security, Livelihoods, human settlements	Health & Sanitation
(S0)	Status (Natural variability)*	1	0	1	-1	-1	-2	-1	-2	-1	0
(S1)	Status (+CC Impacts)**	-2	-1	0	-2	-2	-3	-2	-3	-2	-1
<u>Dev. Goals/Policies (+CC Impacts)</u>											
(A)	Economic Growth	-2	-1	-1	-3	-2	-2	-1	-2	-2	-2
(B)	Poverty reduction /rural development	-2	-1	-1	-2	-1	-2	-2	-2	-2	-2
(C)	Food security (self sufficiency)	-3	-2		-2	-3	-2	-2	-2	-2	
(D)	Employment & education	-1	-1	-1	-2	-2	-2	-1	-2	-2	-2
(E)	Infrastructure			-1		-1	-2	-1	-2	-2	-1
(F)	Sustainable management of natural res		-1	-1	-1	-2	-2	-2	-2	-2	
(G)	Budget defecit reduction	-2	-1	-2	-2	-2	-2	-1	-2	-2	-2
(H)	Good governance				-1	-1	-1	-1	-1	-1	-1
(I)	Water and sanitation				-2	-3	-2	-2	-2	-2	



Development Effects on Adaptation (DEA-AIM): SL - CC Impacts and Effects of Development Goals/Policies on VA Areas

		Vulnerable & Adaptation (VA) Areas									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Economic			Environmental				Social		
		Agr Output	Fishery Production	Trade and Industry, Tourism	Infrastructure	Water Resources	Coastal & Marine Resources	Biodiversity, Forest, Wildlife	Land & Soil	Social Security, Livelihoods, human settlements	Health & Sanitation
(S0)	Status (Natural variability) *	1	0	1	-1	-1	-2	-1	-2	-1	0
<u>Dev. Goals/Policies (No CC Impacts) => **</u>											
(A)	Economic Growth	1	1	3	3	-2	-2	-2	-1	1	2
(B)	Poverty reduction /rural development	1	1	1	1	1	1	1	1	2	2
(C)	Food security (self sufficiency)	2	2	1	1	-2	-1	-1	-2	2	1
(D)	Employment & education	-1	0	3	2	-1	-1	-1	-1	1	2
(E)	Infrastructure	2	2	3		-1	-1	-1	-1	2	2
(F)	Sustainable management of natural res	1	1	1	0	3	3	3	3	2	3
(G)	Budget deficit reduction	-2	-2	-2	-2	-1	-1	-1	-1	-2	-2
(H)	Good governmace	2	2	3	3	3	3	2	3	3	2
(I)	Water and sanitation					2	1	1	1	3	3
(S1)	Status (+CC Impacts)**	-2	-1	0	-2	-2	-3	-2	-3	-2	-1



Some Policy Options



Impact of budget deficit reduction on infrastructure

- Need for investment into infrastructure (esp. rural roads, drainage);
- due to the increase in extreme weather events from climate change there will be adverse effects on social security, livelihoods and human settlements - these should be exempt from budget cuts



Impact of economic growth on water resources



- Need to formulate a policy, legal instruments and transparent mechanisms for implementation to ensure improved efficiency of water use, pollution controls, regulations for water allocation;
- also need for valuation of water as a resource for different uses



Impact of food security on water resources



- improve efficiency of water use,
- pollution controls,
- regulations for water use,
- water allocation policies,
- valuation of water as a resource for different uses,
- legal instruments to be put in place especially for sustainable agriculture and land use.
- enforce policies on best practices.
- institutional structuring for enforcement & monitoring,
- Proper implementation of existing policies and legal instruments.
- Develop proper marketing channels for alternative crops to move people away from high water consuming crops,
- Reduce post harvest losses.
- **Research options –**
 - cultivation options and crop varieties which require less water.
 - compile all available research studies on agriculture and give to relevant institutions to implement.
 - better irrigation systems that are more cost effective.



Impact of food security on land and soil

- Develop more intensive cultivation in a sustainable manner rather than extensive cultivation.
- More emphasis on extending current Soil Conservation and Land Use Act to other districts also. For example, land that slopes more than 30° and above 5000 ft should not be cultivated.
- Need for coordination and communication between national, regional, local private, and government institutions and NRMC etc.
- Importance of agroforestry should be stressed. Awareness and education programs for agriculture and forestry officers.
- Incentives and penalty systems by government to conserve soil and prevent degradation, especially in upper catchment areas.
- Promote homegardens with crops that are not destructive to land
- **Research options**
 - better soil conservation measures, tillage, conservation of soil moisture,
 - classification of various lands depending on the land capability for different uses,
 - food crops that are not destructive to land and soil.





Effect of economic growth on coastal and marine resources

- Enforcement of environmental safeguards and regulations.
- Importance of enforcing Coast Conservation Act and National Environmental Act



Thank You



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