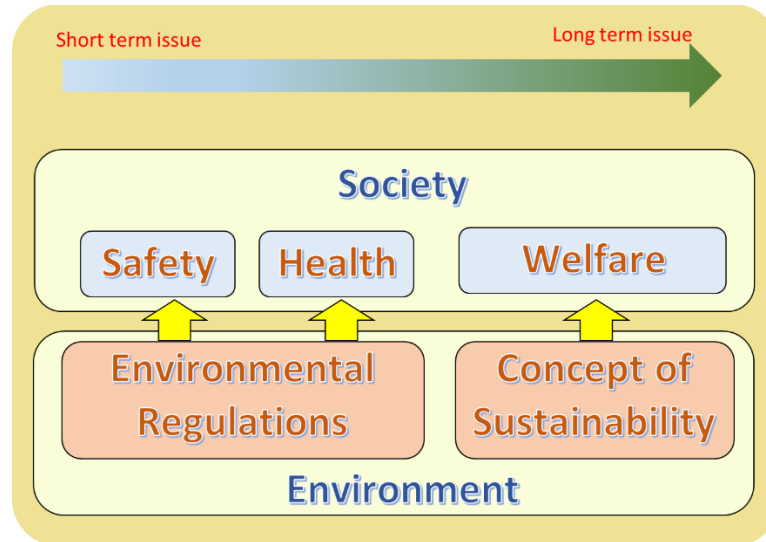


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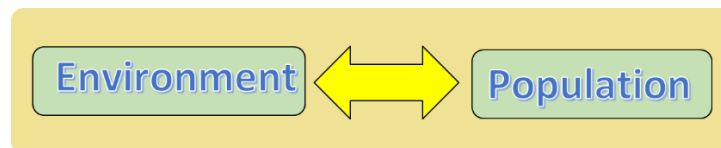
Chapter 16 and 17

Introduction:

As professionals we need to take care of safety, health, and the welfare of the society. There is always interaction between society and environment. The source of all environmental regulations is to support safety and health for the society. Safety is a short-term action and health is the bad impact which is generated in longer terms or mid-term situations. Welfare of society in regards to the environment is a long-term phenomenon. To protect the environment in long term the concepts of sustainability should be applied to human activities.



One fundamental step to mitigate the problem is controlling population.



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Each problem can be discussed in three levels: macro level, meso level and micro level.

Table 1: Dealing with Environmental Threats

	Applicability
Macro Scale	Needs international treaties
Meso Scale	Countries, cities laws regulate them
Micro Scale	In homes

Environmental Threats:

There are three elements of environment; air, water, and soil. Therefore, environmental threats can be categorized in 6 groups.

Table 2: All Environmental threats

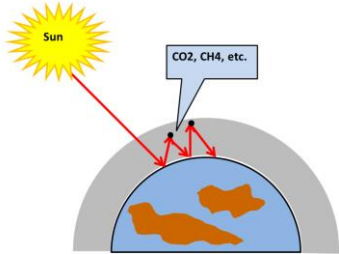
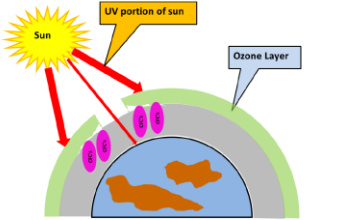
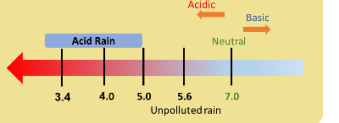
	Air	Water	Soil
Macro Scale	1 - Green House Gas emission -Ozone layer depletion -Acid rain	4 - Ocean pollution (e.g. oil spill)	7 - Soil contamination
Meso Scale	2 - Local air pollution	5 Local water body pollution	8 -Solid waste
Micro Scale	3 - Indoor air pollution	6 NA	9 NA

Some of environmental threats are discussed in the book and are summarized here:

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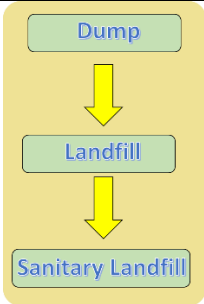
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Table 3: Dealing with Environmental Threats

	Topics	Guilty parties	Dealing		
			Generation	Transfer	Recipient
Green House Gas emission		CO ₂ , CFC's, CH ₄ , Ozone(O ₃), NO ₂ ,	Elimination of gas emitters, Implementation 3R approach	Not available	Not available
Ozone Layer Depletion		CFC's	Elimination of gas emitters, Implementation 3R approach	Not available	Not available
Acid rain		Emission of acid gases like CO ₂ , SO ₂ , NO _x SO _x + NO _x + water droplets → Sulphuric-Nitric Acid	Elimination of gas emitters, Implementation 3R approach	Not available	Not available
Local Air pollution		Six main pollutants: -Carbon Monoxide (CO) -Sulfur Oxides (SO ₂ & SO ₃) -Nitrogen Oxides (NO _x) -Unburnt Hydrocarbons	Elimination of gas emitters, Implementation 3R approach	Available	Putting masks

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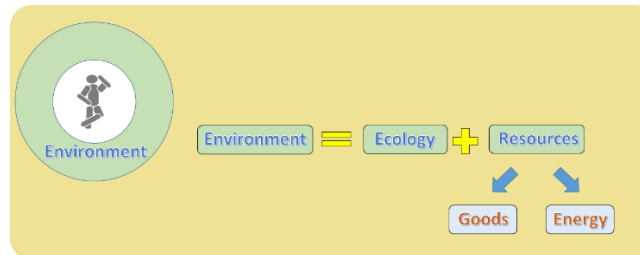
	Topics	Guilty parties	Dealing		
			Genertion	Transfer	Recipient
		-Ozone (O ₃) -Particulates They can also be combined together and generates another problem like: Smogs			
Water pollution	-Realease of contaminated water kills the water animals and plants directly - Realease of contaminated water may stimulate growth of plants and then kills the water animals by depleting the level of dissolved oxygen in water.	-Physical contaminants: Heat, suspended solids -Chemical contaminants: heavy metals, Acidification -Organic contaminants: -Biomatter contaminants: pathogens (disease-causing bacteria)	Implementation 3R approach	Not available	Not available
Solid Waste		Mainly human activities	Elimination of waste generators, Implementation 3R approach	Not available	Not available

Sustainability Threats:

We are living in environment. We use environment for enjoyment and for usage. We use two aspects of environment; Natural resources (goods) and energies (e.g. fossil fuels).

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From sustainability view point, we deal with three elements of environment and also energy. Therefore, sustainability threats can be theoretically categorized to 12 groups. But presently there few sustainable threats are available.

Table 4: All Environmental unsustainable actions

	Air	Water	Land	Energy
Macro Scale	1 - Climate Change -Fossil fuel depletion	4 NA	7 NA	10 Energy conservation
Meso Scale	2 - Energy Consumption	5 -Water over-consumption	8 NA	11 Energy conservation
Micro Scale	3 NA	6 Water over-consumption	9 NA	12 Energy conservation

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Table 5: Dealing with Environmental Threats

	Topics	Guilty parties	Dealing		
			Generation	Transfer	Recipient
Climate Change	<pre> graph LR A[Gas Emission] --> B[Green House Effect] B --> C[Global Warming] C --> D[Climate Change] </pre>	CO ₂ , CFC's, CH ₄ , O ₃ , NO ₂	Elimination of gas emitters, Implementation 3R approach	Not available	Not available
Fossil Fuel Depletion	Decrease of fossil fuel resources and the sole source of energy	Over consumption of energy	-Reducing wasteful consumption -Increasing efficiency of energy users -Finding other resources for energy	Not meaningful	Not meaningful