

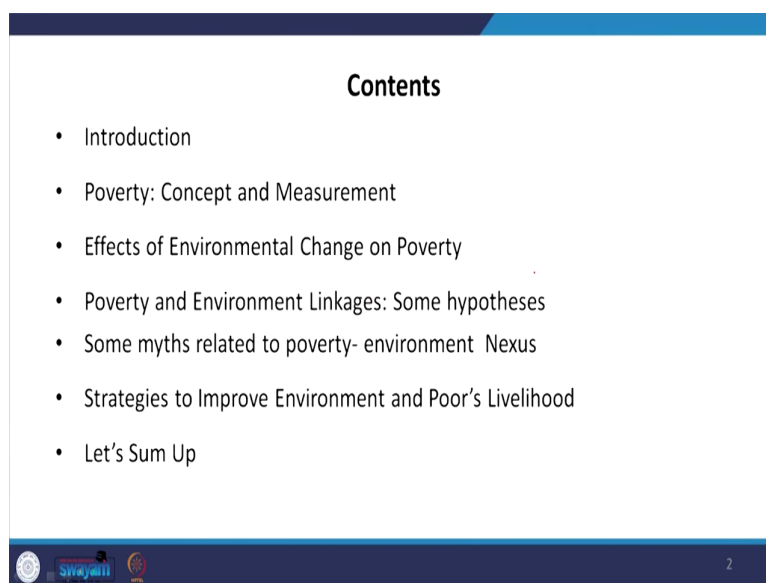
Introduction to Environmental Economics
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Lecture – 16
Poverty and Environment Linkages – I

Dear students, in the preceding lecture I explained the relationship between economic growth and environment. In that lecture, you have studied how economic growth affect the economic growth affect the environmental conditions, and you have also studied environmental Kuznets curve which clearly indicates that in the initial stage of economic development pollution increases, but after a particular level of economic development pollution start declining. So, this is known as environmental Kuznets curve.

Today, in this lecture you will study about the linkage between Poverty and Environment. Poverty, how poverty affect the environment and how environment affect the poverty, so this interrelationship between poverty and environment will be discussed in this lecture.

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- Poverty: Concept and Measurement
- Effects of Environmental Change on Poverty
- Poverty and Environment Linkages: Some hypotheses
- Some myths related to poverty- environment Nexus
- Strategies to Improve Environment and Poor's Livelihood
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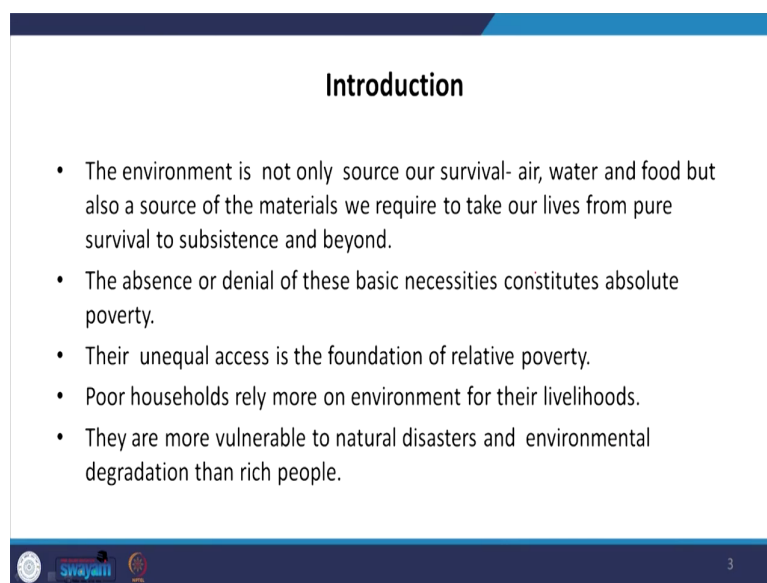
Let me first explain or tell you the main content of this lecture. Apart from introduction of the lecture you will study about the concept of poverty, what is poverty, how it is measured, and then you will study about the effects of environmental changes on poverty. Changes maybe in a positive direction or changes maybe in a negative direction, there maybe improvement in environment. So, if there is a improvement in environment, how it is going to affect the poverty and if there is a degradation in environment how it is going to affect the poverty.

So, effects of environmental change on poverty will be examined in next subsection. Then, we try to establish the relationship or linkages between poverty environment and there are certain hypothesis which will be examined, and after that some myths related to the poverty environment nexus will be examined and finally, you will know what kind of strategy can be

adopted to improve both, the environmental conditions as well as reduce the poverty. And then finally, we will come up to the lecture.

Environment is not only source of our survival like air, water, food, these are very much essential for our survival, but environment also is a source of various materials we require to take our lives from pure survival to subsistence and beyond.

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Introduction

- The environment is not only source of our survival- air, water and food but also a source of the materials we require to take our lives from pure survival to subsistence and beyond.
- The absence or denial of these basic necessities constitutes absolute poverty.
- Their unequal access is the foundation of relative poverty.
- Poor households rely more on environment for their livelihoods.
- They are more vulnerable to natural disasters and environmental degradation than rich people.

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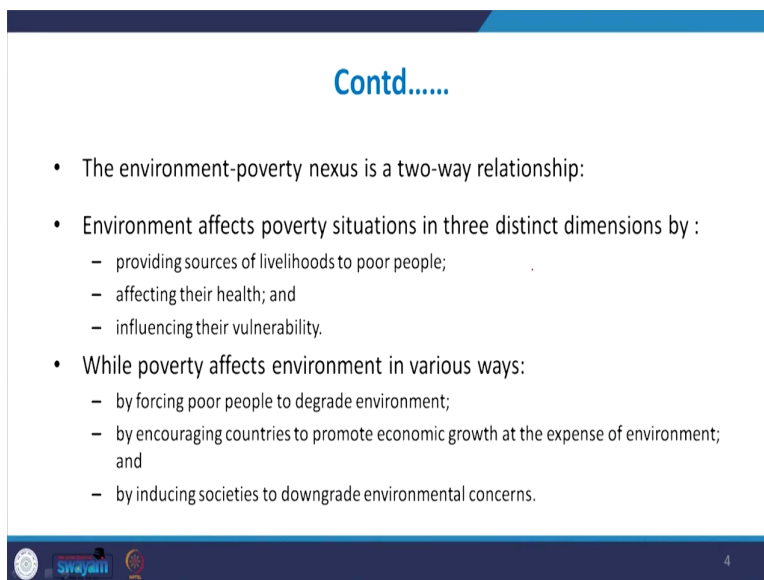
So, not only environment is necessary for our existence, for our survival, like we get water, air, food from the environment, but it also supports our livelihood and also improves our living conditions. So, therefore, improvement of environment is very very essential in context of improving the well-being of the society and reducing the poverty.

The absence or denial of these basic necessities constituted absolute poverty. Actually, if we are not having access to the basic needs like food, shelter, clothing, basic needs then we are termed as poor absolute poor. So, absence or denial of these basic necessities constitute absolute poverty and there unequal access among the society is the foundation of relative poverty. So, I will explain these two concept of poverty, what is absolute poverty and what is relative poverty in contrast of environment.

Poor households rely more on environment for their livelihoods, because poor people draw their food, fodder fuel from the environment. So, as compared to the rich people poor people rely more on environmental resources. So, they rely more on ecosystem services forest resources, water resources and many other environmental resources. They are more vulnerable to natural disasters and environmental degradation then the rich people.

So, if environment is degraded if natural hazards occurs the most sufferers are the poor people as compared to the rich people. So, therefore, the relationship between poverty and environment becomes very very essential to understand.

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The slide is titled "Contd....." in blue text. It contains three main bullet points. The first bullet point states that the environment-poverty nexus is a two-way relationship. The second bullet point states that the environment affects poverty situations in three distinct dimensions: providing sources of livelihoods to poor people, affecting their health, and influencing their vulnerability. The third bullet point states that poverty affects the environment in various ways: by forcing poor people to degrade the environment, by encouraging countries to promote economic growth at the expense of the environment, and by inducing societies to downgrade environmental concerns. At the bottom of the slide, there are logos for "swayam" and a small number "4".

- The environment-poverty nexus is a two-way relationship:
- Environment affects poverty situations in three distinct dimensions by :
 - providing sources of livelihoods to poor people;
 - affecting their health; and
 - influencing their vulnerability.
- While poverty affects environment in various ways:
 - by forcing poor people to degrade environment;
 - by encouraging countries to promote economic growth at the expense of environment; and
 - by inducing societies to downgrade environmental concerns.

Environment-poverty nexus is actually a two-way relationship. Here environment affects poverty situation in three distinct dimensions by providing source of livelihood to the poor people affecting their health and influencing their vulnerability. So, these are the three-dimension of the poverty which are affected by the environment. For instance, if environment is degraded, if pollution occurs then certainly the sources of livelihood of the poor people will be badly affected. Like if there is a deforestation, then many poor people they depend upon forest produces minor or major forest produces. So, if there is a depletion of forest resources then obviously, the livelihood of poor people will be affected.

Not only livelihood, so environmental degradation also affect their health. Most of the poor people affected by the pollution because poor people cannot escape themselves from the adverse consequences of climate change, adverse consequences of flood, disaster etcetera as

compared to the rich people show their health is also affected due to environmental degradation.

And third dimension of poverty is vulnerability. So, poor people are more vulnerable to the environmental risk. So, therefore, environment affects the situation of poverty by providing source of livelihood to the poor people, affecting their health, and influencing their vulnerability.

So, if environment is improved then all these three-dimensions of poverty will go in a positive direction livelihood will improve, health will improve, and the poor people have less vulnerability to the environmental risk and therefore, their well being will be improved. This is one argument or one way to establish the relationship between environment and poverty.

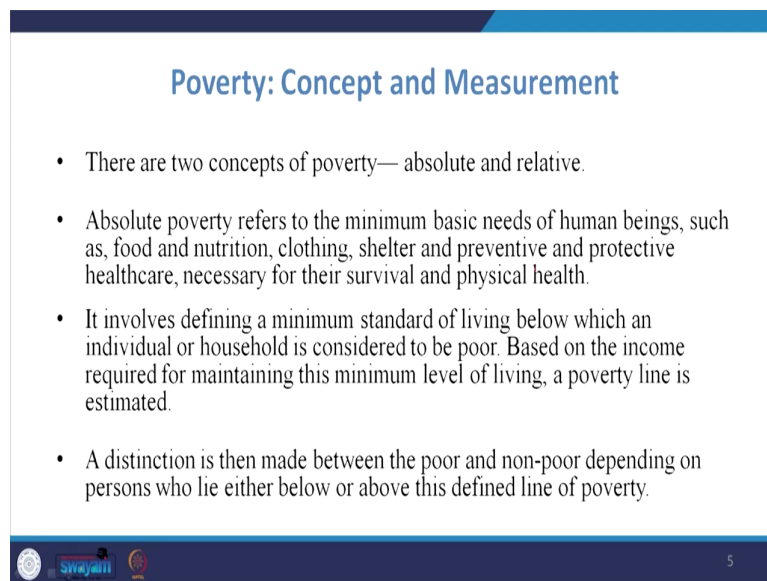
Second way is poverty affect environment in various way. So, not only environment affect poverty, but poverty also affect the environment. So, there is a two way relationship between poverty environment and if there is a high intensity of poverty in a particular region that will affect the environment by force in the poor people to extract more environmental resources, to degrade the environmental resources, to or grace the grasslands to cut more fuel woods etcetera. So, environment is affected due to the high intensity of poverty.

Moreover, if there is a high intensity of poverty then many countries will try to increase the GDP growth rate and while doing this there maybe possibility that when economic activity increases, when GDP growth rate increases then pollution will also increase. So, poverty indirectly also and case the countries to promote economic growth at the expense of environment.

And third, by inducing society to downgrade the environmental concerns. It is generally observed that the poor people considered environment there last priority. First priority is their food, fodder fuel, their livelihood, their existence. So, therefore, when there is a high intensity of poverty in any region that will also affect the environment adversely.

Now, let us first discuss what is poverty. It is very very essential to know what is poverty, where are the poor's and who are the poor's. So, if we know, if we are knowing where are the poor's, who are the poor then appropriate policies can be adopted to (Refer Time: 11:05) case the or address the issue of poverty. So, there are actually two concept of poverty, one is absolute poverty and other is relative poverty.

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Poverty: Concept and Measurement

- There are two concepts of poverty— absolute and relative.
- Absolute poverty refers to the minimum basic needs of human beings, such as, food and nutrition, clothing, shelter and preventive and protective healthcare, necessary for their survival and physical health.
- It involves defining a minimum standard of living below which an individual or household is considered to be poor. Based on the income required for maintaining this minimum level of living, a poverty line is estimated.
- A distinction is then made between the poor and non-poor depending on persons who lie either below or above this defined line of poverty.

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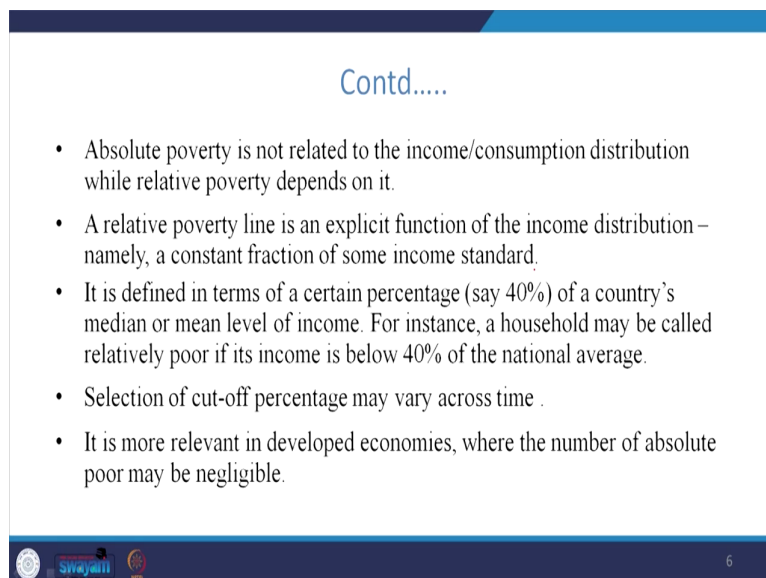
Let me first explain, what is absolute poverty. Absolute poverty refers to the maximum minimum basic needs, I am repeating absolute poverty refers to the basic minimum needs of human being such as food and nutrition, clothing, shelter, preventive and protective healthcare, necessary for survival and physical health. So, if a household or if a person is not able to get access to the basic minimum needs like food, cloth, shelter, health care, etcetera, then the household or person will be treated as poor.

Absolute poverty involves defining a minimum standard of living below which an individual or household is considered to be poor. And based on this income required for maintaining, the minimum basic level of poverty line is constituted or poverty line is estimated. I can explain that for example, in India poverty is a unit dimensionally measured and it is measured on the basis of calories.

So, if a household, if a household is not getting minimum calorie and that calorie was set initially 2400 in rural area per person per day and 2100 in urban area per person per day. If a household member are not able to get the minimum calories to consume then that household will be treated as poor. So, poverty line is fixed on the basis of calorie requirement that is necessary for the healthy body.

A distinction is then made between the poor and non-poor depending upon the person who lie below or above the defined poverty line. So, poverty line is estimated on the basis of consumption expenditure and then a person who is consume below the minimum calories will be treated as poor and a person who is consuming above the minimum calorie will be treated as above poor.

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- Absolute poverty is not related to the income/consumption distribution while relative poverty depends on it.
- A relative poverty line is an explicit function of the income distribution – namely, a constant fraction of some income standard.
- It is defined in terms of a certain percentage (say 40%) of a country's median or mean level of income. For instance, a household may be called relatively poor if its income is below 40% of the national average.
- Selection of cut-off percentage may vary across time .
- It is more relevant in developed economies, where the number of absolute poor may be negligible.

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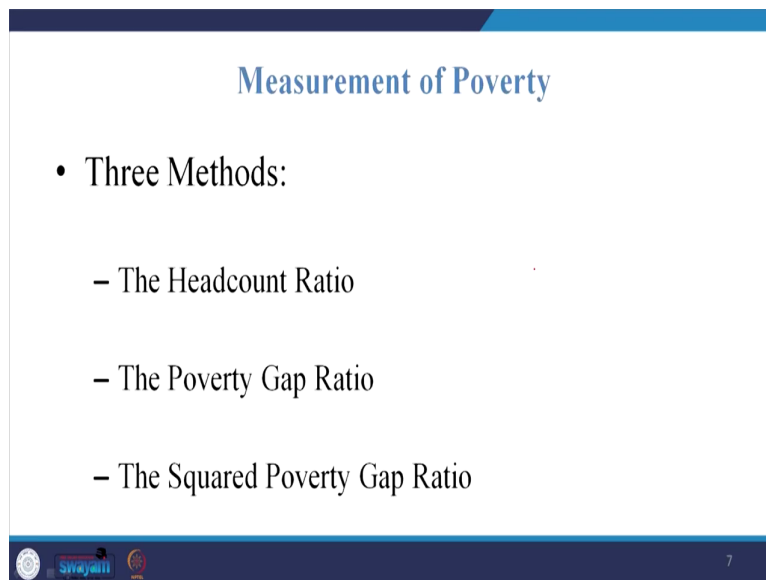
Absolute poverty is not related to income or consumption distribution. So, so for that matter relative poverty is relevant. So, if you want to access the income or consumption distribution then relative poverty is measured, but in most of the developing country like India absolute poverty is more relevant because majority of people in these countries are not able to access to the basic minimum needs. While in developed countries households are having access to the basic needs, so the concept of the relative poverty is more relevant for these countries and relative poverty line is an explicit function of income distribution. And here while estimating the relative poverty a constant fraction of some income standard is considered.

It is defined in terms of a certain percentage. For example, say 40 percent of country's median or mean level of income maybe made a poverty cutoff and if a households income is below the 40 percent of the median income of a country then the household will be treated as related to

poor. For instance, a household may be called relatively poor if its income is below 40 percent of the national average, average maybe median or mean.

Selection of cutoff percentage may vary across time. So, it is not static actually, depending upon the economic condition how the country is growing then this percentage can be changed. So, the percentage whether it is 40 percent, 30 percent is arbitrary and it may change from country to country and from time to time. It is more relevant in developed economies where number of absolute poor maybe negligible.

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The slide is titled "Measurement of Poverty" in blue text. It lists three methods for measuring poverty:

- Three Methods:
 - The Headcount Ratio
 - The Poverty Gap Ratio
 - The Squared Poverty Gap Ratio

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Now, we have 3 methods to measure poverty, they are headcount ratio, poverty gap ratio and squared poverty gap ratio.

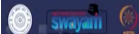
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Head Count Ratio

The headcount ratio of measuring poverty is defined as the percentage of the total population that is poor. Thus, it is measured as the proportion of the population that is counted as poor. It is estimated as:

$$P_0 = \frac{N_p}{N}$$

Where P_0 is headcount ratio; N_p is the number of poor; and N is the total population. If the monthly per-capita consumption expenditure (MPCE) of 60 million households out of 179 million households of rural India is below the cut-off point, the headcount poverty ratio is $= 60/179 = 0.3352$. This means 33.52 percent of rural households in India are below the poverty line. If the value of MPCE (say Y_i) in a sample of household is below the poverty line (say Z), i.e. $Y_i < Z$ then the i^{th} household is counted as poor. If the value of $Y_i > Z$, then the i^{th} household is counted as non-poor. Thus, the aggregate value of 'proportion of poor household' by the headcount method (P_0) in a region can be represented as:

$$P_0 = \frac{1}{N} \sum_{i=1}^N Y_i \quad (\text{if } Y_i < Z)$$
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Headcount ratio is very frequently used by different countries to measure the poverty and headcount ratio of measuring poverty is defined as the percentage of total population that is poor. Thus it is measured as the proportion of population that is counted as poor and simple form is P_0 is equal to N_p divided by N , and here P_0 is headcount ratio N_p is number of poor and N is total population. So, if you divide number of poor's by total population of a region or of a country of a state then you will get headcount ratio.

If for example, if the monthly per capita consumption expenditure of 60 million households out of 179 million households of rural India is below the cutoff point, the headcount ratio would be 60 divided by 179 equal to 0.3352. It means that 33.52 percent households are living below the poverty line.

If the value of monthly per capita consumption expenditure, you can say like Y_i in a sample of household is below the poverty line, poverty line here we defined like Z . So, if Z is the poverty line Y_i is the income of the i th households, then Y_i must be lesser than Z in case of person living below the poverty line. So, if Y_i is lesser than Z then i th household will be counted as poor.

And in this way we can get the aggregate value of person living below the poverty line. So, simple formula is $P_0 = \frac{1}{N} \sum_{i=1}^N Y_i$ bracket, if Y_i is lesser than Z then Y_i will be counted means we will count only those households whose per capita consumption expenditure is lesser than Z .

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Poverty Gap Ratio (PGR)

For studying the intensity of poverty, estimation of PGR is useful. It tells us the extent to which individuals, on average, fall below a poverty line.


It is a key indicator that measures how far the extremely poor fall below the poverty line reflecting both the depth and incidence of poverty.

It is estimated as:

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{Z}$$

Where P_1 is PGR; N = number of hhs; G_i = poverty gap i.e. the difference between the MPCE Y_i and the level of Z taken as the minimum income required for basic sustenance.

If $Y_i > Z$, then G_i is taken as equal to 0 and if $Y_i < Z$, G_i is taken as equal to $Z - Y_i$.


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Then we can also calculate poverty gap ratio. Why poverty gap ratio is required to be estimated? Because in case of headcount ratio we cannot know how what is the incidence of

poverty. For example, if there are two households having the same level of poverty, but in one household the consumption level is much below than the other households then that household will be treated as more poor as compared to the household, which consumption expenditure is greater than the previous households.

So, in that case poverty gap ratio is estimated. And for studying the intensity of poverty we estimate the poverty gap ratio. Poverty gap ratio tells us the extent to which individuals on average fall below the poverty line, and actually it is an indicator that measures how far the extremely poor people fall from the poverty line reflecting both the depth as well as incidence of poverty.

And it is estimated by a formula, you can see from the slide $P_1 = \frac{1}{N} \sum_{i=1}^N G_i$ is equal to $\frac{1}{N} \sum_{i=1}^N \frac{Z - Y_i}{Z}$. So, here P_1 is poverty gap ratio, N is number of households, G_i is poverty gap, that is the difference between the monthly consumption expenditure of i th households and the level of Z taken as the minimum income required for basic sustenance or poverty cut off.


If Y_i is greater than Z then G_i is taken as equal to 0, and if Y_i is lesser than Z then the difference will be estimated and $Z - Y_i$ will be considered as the gap. So, gap can be estimated only when the Z is greater than Y_i . If Z is lesser than Y_i the gap will be treated like 0.

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Squared Poverty Gap Ratio

The SPGR, which considers the sum of squares of G_i/Z values, measures the severity of poverty. As a weighted sum of poverty gaps, where the weights are the proportionate poverty gaps themselves, it is sensitive to the prevalence of the poor by the extent to which their incomes fall below the poverty.

This is in contrast with the PGR method, where the gaps are all weighted equally. Hence, by squaring the poverty gap index, the measure implicitly puts more weight on observations that fall below the poverty line. The SPGR (P_2) is:

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^2.$$
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Then third method of measuring poverty is squared poverty gap ratio. Square poverty gap ratio is actually an improvement over the poverty gap ratio. It considers the sum of square of G_i divided by Z . So, this is the ratio of gap to poverty line values and it measures the severity of poverty, how severe the poverty is, how serious the poverty is that is measured by square poverty gap ratio.

As a weighted sum of poverty gaps where the weights are the proportionate poverty gaps themselves it is sensitive to the prevalence of the poor by the extent to which their income falls below the poverty line. So, basic difference between poverty gap ratio as a measure of measuring poverty and square poverty gap ratio is that here we take the square of that gap instead of taking simply gap. And this is in contrast with the poverty gap ratio where the gaps

are all equal weighted. Hence, by squaring the poverty gap index the measure simply or implicitly puts more weight on observation that fall below the poverty line.

So, when we measure square poverty gap ratio by squaring the gap more weights are given to the observations that fall below the poverty line. So, therefore, it is an improvement over the poverty gap ratio and formula is $P_2 = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{Z} \right)^2$. So, it is a square of sum of square of gaps divided by Z.

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Poverty Estimate: An Example									
Region	MPCE in Rs.								Poverty Ratios
	1	2	3	4	5	6	7	8	Z=Rs. 800
Region I	950	1100	1000	975	750	775	790	1400	P0: 3/8=0.375
Poverty Ga	0	0	0	0	50	25	10	0	
G _i /Z	0	0	0	0	0.0625	0.03125	0.0125	0	P1: 0.1063/8=0.133
(G _i /Z) ²	0	0	0	0	0.0039	0.0010	0.0002	0	P2: 0.0051/8=0.00064
Region II	1250	1150	1400	1100	550	600	490	1200	P0: 3/8=0.375
Poverty Ga	0	0	0	0	250	200	310	0	
G _i /Z	0	0	0	0	0.3125	0.25	0.3875	0	P1: 0.95/8=0.119
(G _i /Z) ²	0	0	0	0	0.0977	0.0625	0.1502	0	P2: 0.31036/8=0.039

Let me take a simple example to explain you all the 3 measures of poverty. Take the example of two regions, region first and region second. We take it households in both the regions, and here in second rows we have the income per capita consumption expenditure in rupees of each households, like in region first 950 is the monthly per capita consumption expenditure of first

households and 1100 second household, 1000 third household etcetera. And similarly in region second we have 1250 monthly per capita consumption expenditure of first households, 1150 second households, 1400 third household etcetera.

Now, if you want to estimate P_0 that is headcount ratio then you have to considered only those households which are having monthly per capita consumption expenditure below the cutoff, and cutoff Z is here 800. So, in that case we have household number 5, 6 and 7, these 3 households are having per capita consumption expenditure below 800. So, here the household below the poverty line are 3 and total households are 8. So, 3 by 8 is equal to 0.375, so you can say that say 37.5 percent of the households in region first are below the poverty line when we apply headcount ratio.

Similarly, in region second there are 3 households which are having monthly per capita consumption expenditure below 800 and they are household number 5, 6 and 7. So, again 3 by 8 equal to 0.375 is the headcount ratio or 37.5 percent households are below the poverty line in region second to.

So, from this example you observe that in both the region, region first and region second when we measure the poverty by headcount ratio poverty is same. But when we take poverty gap ratio then we find that intensity of poverty in region second is higher than the region first.

So, what you have to do is first you had to calculate the poverty gaps. And poverty gaps means if household consumption expenditure is below Z then gap will be assessed. So, here in case of household number 5 the household consumption expenditure is 750 rupees and poverty is 800. So, 800 minus 750 is 50 the gap. Then in 6th household 25 rupees in the gap and in 7 rupees 10 is the gap.

So, now we get the gaps. After getting the gaps what you have to do is then you take the ratio of gap to the Z poverty line and that is G_i divided by Z . So, G_i divided by Z is 50 divided by 800, 25 divided by 800 and 10 divided by 800 and after this you can take the sum of all these gaps and divide by the N . So, sum of G_i divided sigma G_i divided by Z , divided by Z is calculated and then you can calculate the poverty gap ratio by dividing this sum from N , N is

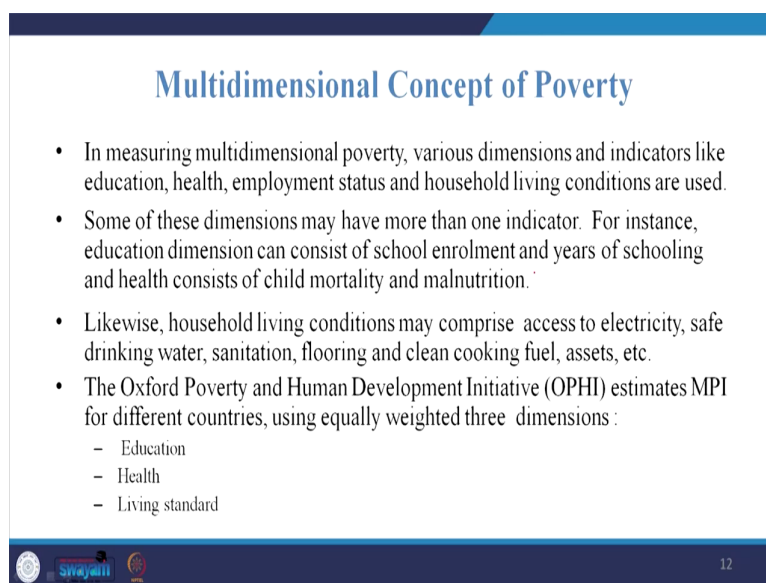
number of households and N is 8. So, 0.1063 divided by 8 is equal to 0.0133, so this is poverty gap.

And now in the same manner you can also calculate the poverty gap in region second and it is estimated 0.95 divided by 8 equal to 0.119. So, now you can see the difference although headcount ratio in both the region is same, but poverty gap ratio is different. Poverty gap ratio in region second is higher than region first and therefore, this provide important implication for the policy that more efforts are required to reduce the poverty gap in region second as compared to region first. But again as I already told you that poverty gap ratio provide equal weights.

So, therefore, incidence of poverty or severity of poverty cannot be estimated by poverty gap. So, in that case we measure the squared poverty gap and look at again the table. Now, what you have to do is you have to take the square of G_i divided by Z , and when we take the square of G_i divided by Z and then take the sum and for the divided by 8 that is number of households we get the square poverty gap ratio. And square poverty gap ratio in second first region is 0.00064, quite low on near to 0.

While in case of region second it is 0.039, so you can again find that in region second the severity of poverty is higher as compared to region first. So, therefore, square poverty gap measure as poverty is better as compared to headcount ratio or poverty gap ratio because it tells us how severe the poverty is in a particular region.

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Multidimensional Concept of Poverty

- In measuring multidimensional poverty, various dimensions and indicators like education, health, employment status and household living conditions are used.
- Some of these dimensions may have more than one indicator. For instance, education dimension can consist of school enrolment and years of schooling and health consists of child mortality and malnutrition.
- Likewise, household living conditions may comprise access to electricity, safe drinking water, sanitation, flooring and clean cooking fuel, assets, etc.
- The Oxford Poverty and Human Development Initiative (OPHI) estimates MPI for different countries, using equally weighted three dimensions :
 - Education
 - Health
 - Living standard

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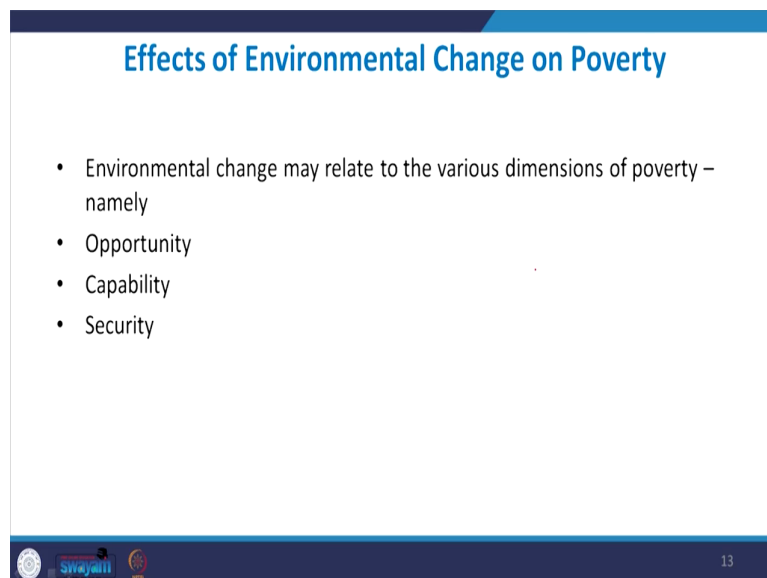
Apart from unidimensional concept to the poverty which I just explain which is used still in India, when we measure poverty in India we use unidimensional poverty which is largely based on calorie consumption. But, now as we know poverty cannot be accessed only in terms of single indicator (Refer Time: 32:18), monthly per capita consumption expenditure.

So, now multidimensional concept of poverty is also being considered and many countries are now developing multidimensional poverty methodology and measuring the multidimensional poverty. And in measuring the multidimensional poverty, we takes various dimensions or indicators which affect the well being of the society, well being of the poor people like education health employment status household living condition etcetera. Oxford poverty and human development initiatives is pioneer in measuring the multidimensional poverty across globe in different countries. And it considers 3 dimensions of measuring multi-dimensional poverty, first is education, second is health, third is living standard. And these 3 dimensions

are further classified into certain indicators like education has two indicators, like school and government and year of schooling. Then health also has two indicators like child mortality and malnutrition. Living standards has 6 indicators, including access to electricity, safe drinking water, sanitation, flooring, clean cooking, fuels, assets etcetera and assets are further divided into various categories whether a household is having a particular assets are not.

So, people will be considered deprived if they are not having access to certain kind of assets and then composite index of multidimensional poverty is measured. So, these are the measure concept of poverty.

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Effects of Environmental Change on Poverty

- Environmental change may relate to the various dimensions of poverty – namely
- Opportunity
- Capability
- Security

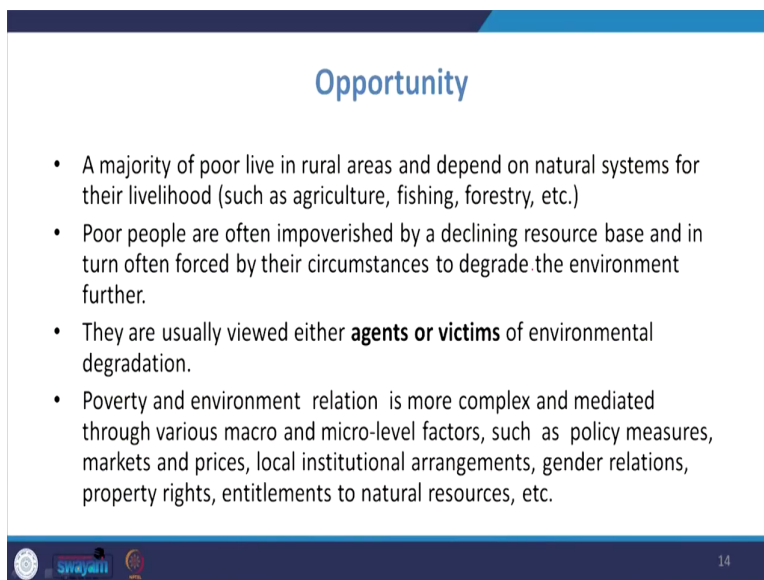
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And we know that poverty is difficult to quantify, but those who are living in distress, living in a poor condition they know the seriousness of the poverty. But here we have to know who are the poors and where are they. Actually, most of the poor people are engaging in engaging in

those activities which requires environmental resources. Like most of the poor people are small and marginal farmers, landless labours and small live stockholders, cattle grazes etcetera and most of them are relying on natural resources. In urban areas also poor people they engage in informal economies and they also live in a very unhygienic conditions, poor environments and therefore, if the environmental degradation occurs most sufferers are these poor people.

So, let me now explain the effects of environmental change on poverty. Change may go in any direction. So, there may be improvement in environment or there maybe deteriorate in environment. So, environment may degrade or environment may improve. So, if there is a change in environment how that change is affecting the poverty can be explained. And here, in relation to environmental change we have 3 key dimension of poverty, one is opportunity, second is capability and third is security. So, I will explain these 3 keywords or key dimension of poverty in context of environmental change.

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The slide is titled "Opportunity" in a blue font. It contains a bulleted list of four points. The first point states that a majority of the poor live in rural areas and depend on natural systems for their livelihood, such as agriculture, fishing, and forestry. The second point notes that poor people are often impoverished by a declining resource base and are often forced by their circumstances to degrade the environment further. The third point mentions that they are usually viewed either as agents or victims of environmental degradation. The fourth point explains that the poverty and environment relation is more complex and mediated through various macro and micro-level factors, such as policy measures, markets and prices, local institutional arrangements, gender relations, property rights, and entitlements to natural resources.

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So, let us take first opportunity. A majority of poor people live in rural area and depend on natural systems for their livelihood, such as agriculture, fishing, forestry. So, most of the poor people they have their livelihood in agriculture, fishing, forestry or in those activities which require natural resources, environment and ecological services.

Poor people are often impoverished by a declining resource base and in turn often forced by their circumstances to degrade the environment further. So, what happens? When there is a high incidence of poverty then this poor people they put more pressure on environmental resources, forest resources, water resources, sanitation etcetera and due to their high dependence on these resources and or extraction of these resources the environment further degrades and it becomes a vicious cycle of poverty.

So, there is a high level of poverty since poor people are depending on environment. So, they put more pressure on environmental resources, environmental resources degrade and their livelihood base is badly affected and when their livelihood base is badly affected again they turn into poverty. So, poverty is you can say complex issues in which a kind of cycle is established like high intensity of poverty may lead to environmental degradation and environmental degradation may lead to further poverty intensification.

They are usually viewed either agent or victim of environmental degradation. This is very important, that poor people there may be either considered as agent of environmental degradation because many analyst thinkers or environmentalist they considered that poverty is the main cause of environmental degradation.

So, poor are considered as agent of environmental degradation, but there are also view that poor people are also the victim of environmental degradation because when environment degrade most sufferers are poor people. If water quality deteriorate, if fuel condition deteriorate, if air condition deteriorate then obviously, poor people will be badly affected because they cannot escape themselves from the adverse consequences of environmental degradation.

Poverty and environment relation is more complex and it becomes even more complicated due to mediated factors like macro micro-level policy related measures, markets, prices, local institutional arrangement, gender relations, property rights, entitlement to natural resources.

So, when we try to establish the relationship between poverty and environment then this relationship is actually not one to one, because there are many mediating factors like policy measures, market forces, prices, local level institutions and gender relations in a particular society and what is the level of property rights, specially whether property rights are well defined or not, what are the entitlement of poor people to use the natural resources. All these factors also affect the environment as well as poverty.

So, the relationship between poverty and environment is very very complex cannot be accessed simply by trying to establish the relationship between the two, unless we also understand many other policy related variables, gender related issues, property rights etcetera.

So, let me know conclude today's lecture. In this lecture, I discussed the different concept of poverty like, absolute poverty and relative poverty. Absolute poverty is more relevant for developing countries where large number of people are not having access to the basic minimum needs. While relative poverty is more relevant for developing countries where they have already achieved high level of living conditions and people are not having any problem in accessing the basic minimum needs.

I also explained you 3 methods of measuring poverty, headcount ratio, poverty gap ratio and square poverty gap ratio, and also discuss the multidimensional concept of poverty. And these days different countries are now measuring the multidimensional concept of poverty which includes not only the access to the basic needs, but also include many other indicators of well being of the society like education, health and living conditions. And I also started the relationship between environment and poverty, and just started the different dimensions of poverty like opportunity, then this security etcetera [vocalized-noise. We will continue this in the next lecture.