

## Sustainable Development with Equity

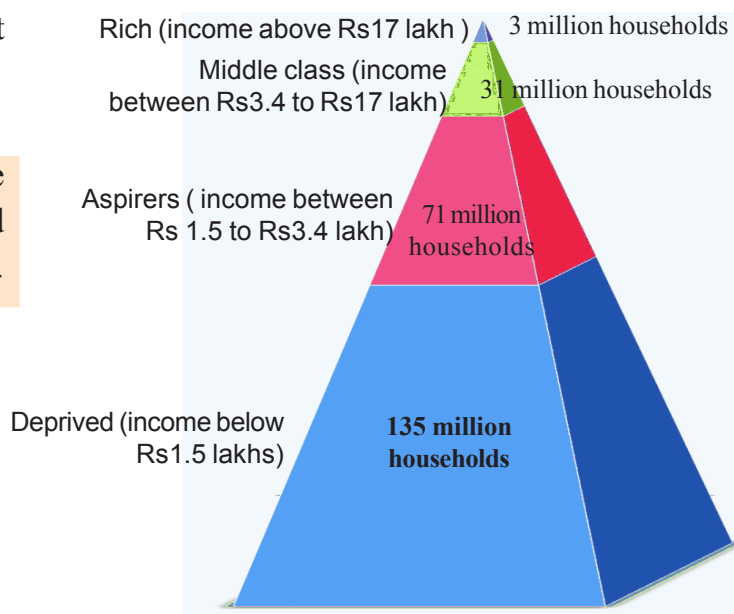
### Looking at development again...

As a measure of development, Human Development Index (HDI) is an improvement over GDP and per capita income (refer to Chapter 2). Whereas GDP is an indicator of the value of goods and services produced in the country, the idea of progress can hardly be limited to production of goods and services. This is more so when rapid expansion of production and incomes, can coexist with malnutrition and lack of education and health for a large proportion of the people, as is the case in India. HDI expands the meaning of development to include social indicators of education and health.

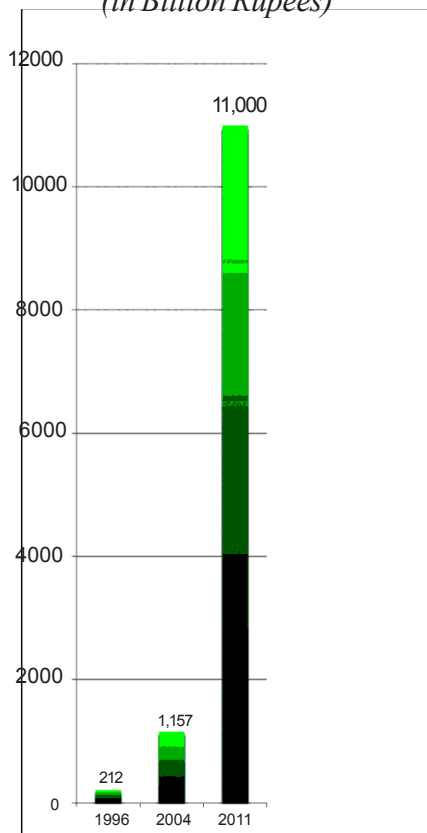
There are, however, many other considerations that even this expanded measure of development does not capture. In India, more than 90% of the workforce is in the unorganised sector, where the conditions of work are not encouraging at all. Incomes of both self-employed and wage workers in the unorganised sector are generally low, at times pitifully so (refer to Chapter 3). With such a high percentage of workforce in low-paid employment, increase in GDP and the enormous variety of goods and services being produced can benefit only select groups. People with high income and wealth are the ones who have all the choices in the world to buy and consume (refer to Chapter 10). While some enjoy world-class living comforts, the vast majority, without proper employment and adequate incomes, are still deprived of minimum necessities for decent living. Such wide inequalities in incomes and opportunities across people cannot be the basis for a just society.

- Write a brief note on the inequality in India based on the graphs and figures.

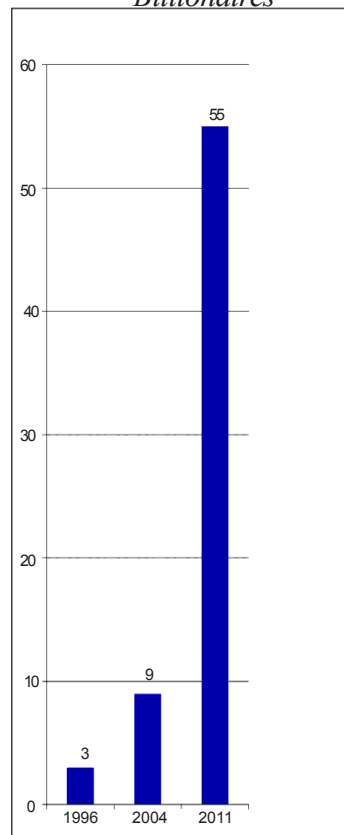
*Graph 1 : Distribution of households in India based on annual income (2010 survey)*



*Graph 2 : Total Wealth held by Billionaires (in Billion Rupees)*



*Graph 3 : Increase in the Number of Billionaires*



*Fig 12.1: Dharavi slum in Mumbai. One of the largest colonies in which the urban poor of India lives*



*Fig 12.2 : A View of Banjara hills from a hotel room in Hyderabad, an area where the rich in Hyderabad lives*



Another major criticism of economic development focused narrowly on GDP springs from its neglect of environment. In various contexts, we have seen how the environmental resources have been used up and damaged to an unprecedented extent in the course of economic growth. Deforestation, soil erosion, lowering groundwater tables, increasing pollution, pressure on grazing land, rising dependence on fossil fuels, industrial emissions, use of chemical fertilisers and pesticides in agriculture, climate change are some of the important and urgent environmental issues before us. While industrialisation has brought a lot of material comforts at least to some, it has resulted in a world where natural resources are threatened and now even the climate is being disrupted. This pattern of growth clearly cannot continue.

In this chapter, we will explore the relationship between development, environment and people. How has expansion of economic activities affected different aspects of environment? What has development meant for peoples' access and rights to natural resources and their lives? Can there be different models of development? We will seek answers to these questions through live issues and peoples' lived experiences. We find that there is need to broaden the focus of development from material goods and services to all people (present & future generations) and the environment with all its living and non-living resources.

## Environment and Development

Let us start by recalling the role of environment in development. Many naturally existing substances like land, water, minerals and ores, products from trees and animals are central to the production process. In primary sector activities - agriculture,

mining, quarrying - and in the manufacturing and energy sector, production is hugely dependent on natural resources. The other sectors of the economy too are dependent on natural resources in various degrees. The potential of an environment to provide these resources is referred to as an "environment's source function". This function is depleted as resources are consumed or pollution contaminates the resources.

There is another function that the environment provides. It is to absorb and render harmless the waste and pollution from various activities. Unwanted by-products of production and consumption say exhaust gases from combustion, water

Revisit the class IX chapters on Indian Agriculture & Industry.

- How have they discussed issues of disparity and distribution and access to resources in these two contexts?
- Identify how the idea of development has been contested through problems of Environment.
- What kind of environmental problems did the spread of "green revolution" create? What lessons does this have for the future?

used to clean products, discarded packaging and goods no longer wanted are absorbed by the environment. This is as important as the source function. The "sink function" describes an environment's ability to absorb and render harmless waste and pollution. When waste output exceeds the limit of the sink function, long-term damage to environment occurs.

In the past fifty years of economic development, both these functions of the environment have been overused. This has been said to affect the carrying capacity of the environment, i.e., the capacity of the environment to support economic production and consumption in the future. Let's look at few examples.

Example 1: As per the traditional practices, the lifting of water was limited to supplemental irrigation or for a small area. For example, with 'mota baavi' only 2 to 3 acres can be irrigated. Agriculture was limited to rainy season and large areas were rainfed drylands. Over time, with new energy resources pumpsets that work with petrol/ diesel and electricity came into picture. The impact has to be seen in two phases: initially there was relief from drudgery; lifting of water became very easy with pumps. Also water was plenty. Open wells had water at 10 to 15 feet deep; utmost 100 feet deep. However, with lifting of groundwater by electric and motor pumps, water table started going down. So much so that in some areas groundwater is being drawn from few hundred feet deep. After all, the water has to go down to the ground for it to be lifted up. This is called 'recharge'. The path of water below ground is through the medium of soil and rocks. If the water drawn up is more than that is being recharged, then it is obvious that after sometime you have no more groundwater left.



*Fig 12.3 : A UN photo from 1957 Farming and irrigation in Rajasthan*

Recent data on the status of groundwater resources in India suggest that the groundwater is under serious threat of overuse in many parts of the country. Nearly one-third of the country is pumping out more groundwater than what goes in as recharge. About 300 districts have reported a water level decline of over 4 metres during the past 20 years, which points to an alarming rate of extraction. Groundwater overuse is particularly found in the agriculturally prosperous regions of Punjab and Western U.P., hard rock plateau areas of central and south India, some coastal areas and the rapidly growing urban settlements.

- Why do you think modern method of lifting water has proved to be unsustainable?

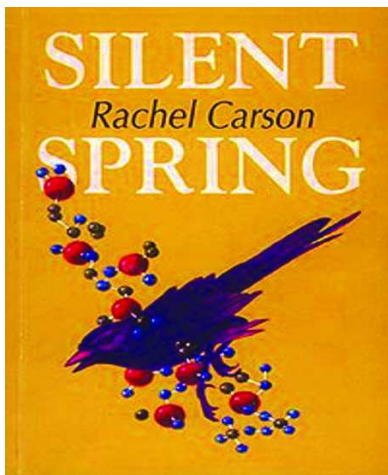
Overuse of groundwater implies that the stock of groundwater is being depleted. Very rapidly the groundwater has been falling to lower and lower levels.

The quality of groundwater is deteriorating, along with the quantity. In 59% of districts of India, water from hand pumps and wells are unsafe for drinking. This is because of contamination of groundwater from chemical industrial waste from agriculture and industry. Water has been used as a sink to dump all kinds of waste and toxic substances. This is not easily reversible. We will see the consequences of this in next example.

This pattern of development is in direct contrast to what sustainable development stands for. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In other words, a better quality of life for everyone - now and for generations to come.

However, the extent of our current resource use is such that the chances of future generations to have access to their fair share of scarce resources are endangered. Moreover, the consequences of our resource use in terms of impacts on the environment may induce serious damages that go beyond the carrying capacity of the environment.

Example 2: Pesticides are an important component of the modern agricultural practice and are used to protect the crops from pests so that the yield is high. Environmentalists, however, realized long time ago that the use of pesticides has adverse impact on the environment. The environment is simply unable to absorb the toxic substances beyond a point.



In the year 1962, Rachel Carson wrote in the book 'Silent Spring' about the impact on birds and human beings of spraying DDT for mosquito control. Substances like heavy metals contained in pesticides do not disappear from the environment but instead accumulate inside living organisms. Thus, the poison in DDT gets deposited in the body of the fishes living in lakes into which the water containing DDT flows. The poison is in too small quantity to kill the fishes. But if one bird eats several fishes, the combined dose of the chemical inside the fishes is lethal enough for the bird. Rachel Carson also showed that insects like mosquitoes quickly develop resistance to DDT sprays. Her findings are a clear example of how human action irreversibly destroys nature and human beings themselves.

In India, the lethal impact of pesticides was seen for pesticide Endosulfan. In 1976, to protect the cashew crop from pests, the government carried out treat-

ment of 15,000 acres of land with Endosulfan, sprayed by helicopter. This happened in Kasargod in the Northern part of Kerala. The air, water and entire environment was suffused with the pesticide, as treatment continued for some 25 years. As a result of the spraying, very serious health problems were seen in the local people, particularly agricultural workers. As at least 5,000 people have died and for countless others, life has become worse than death as cancer and deformities became prevalent.

In the recent years, spraying of endosulfan was banned by a court order. Gradually, there has been a fall in disease and a general increase in well-being.

This is not an isolated incident particular to that area. Numerous studies point to the overuse of pesticides in modern agriculture and its impact on environment and people. Ironically, only one percent of the pesticide actually acts on the pest – the rest goes into our system through food, water and the environment.

- Environment is also called 'natural capital'. Recall the definition of capital from Chapter 9. Why do you think environment is called natural capital?
- Why should water be considered as common property?
- Why was it considered necessary to go to court to stop the use of endosulfan?
- The court order banning the use of endosulfan argued that the pesticide violated the Right to Life (Article 21 of the Constitution). Can you describe how use of endosulfan had violated people's Right to Life?

## People's Rights over the Environment

Today, there are countless cases where attempts at modern development have caused large scale environmental problems. The case of big dams is a classic case and one that has had very painful consequences.

The Narmada Valley Development Project is the single largest river development scheme in India. It is one of the largest hydroelectric projects in the world and is supposed to generate power, provide irrigation and help with flood control. The environmental costs of such a project, which involves the construction of more than 3,000 large and small dams, are immense. The largest of the dams constructed is the Sardar Sarovar, which floods more than 37,000 hectares of forest and agricultural land, displacing more than half a million people and destroying some of India's most fertile land. The project has devastated human lives and biodiversity by inundating thousands of acres of forests and agricultural land. A disproportionate number of those being displaced are Adivasis and Dalits.

The following letter was written by Bava Mahaliya of Jalsindhi village in Jhabua district to the Chief Minister of Madhya Pradesh in 1994. It was recorded in bhilala and translated into Hindi and a part of it is reproduced below. It questions the very idea of development.

Dear Digvijay Singhji,

We, the people of Jalsindhi village... district Jhabua, are writing this letter to you, the Chief Minister of Madhya Pradesh.

We are people of the river bank; we live on the banks of the great Narmada. This year (1994), our village Jalsindhi will be the first village in Madhya Pradesh to be submerged by the Sardar Sarovar dam. Along with us, four or five other villages - Sakarja, Kakarsila, Akadia and others - will also be drowned.... When the water comes into our village, when our homes and fields are flooded, we will also drown - this is our firm resolve.

We are writing this letter to let you know why the adivasi (tribal) peasants of Jalsindhi who are coming under submergence, are preparing to drown themselves.

You, and all those who live in cities, think that we who live in the hills are poor and backward, like apes. "Go to the plains of Gujarat. Your condition will improve. You will develop" - this is what you advise us. But we have been fighting for eight years - we have borne lathi blows, been to jail several times, in Anjanvara village the police even came and fired on us and destroyed our homes.... If it is true that our situation will improve in Gujarat, then why aren't all of us even now ready to go there?

To you officials and people of the town, our land looks hilly and inhospitable, but we are very satisfied with living in this area on the bank of the Narmada with our lands and forests. We have lived here for generations. On this land our ancestors cleared the forest, worshipped gods, improved the soil, domesticated animals and settled villages. It is that very land that we till. You think we are poor. We are not poor. We have constructed our own houses where we live. We are farmers. Our agriculture prospers here. We earn by tilling the earth. Even with only the rains, we live by what we grow. Mother corn feeds us. We have some tilled land in the village and some in the forest area. On that we grow bajra, jowar, maize, *boadi*, *bate*, *saunvi*, *kadri*, *chana*, *moth*, *urdi*, sesame and groundnut. We have many different kinds of crops. We keep varying them and eating.



What grows in Gujarat? Wheat, jowar, tuvar, red gram and some cotton. Less to eat, more to sell. We cultivate in order to eat; we sell only the excess for buying clothes etc. Whether the price in the market be high or low, we get food to eat.

We grow so many different kinds of food, but all from our own effort. We have no use for money. We use our own seeds,

manure from our own livestock - from that we get good crops. Where will we get so much money? Who will know us there? Which moneylender will give us money? If we don't get a good crop and don't have any money, then we will have to mortgage our land.

Here we bring water to our fields by making channels from streams .... If we had electricity, then we could also pump up water from the Narmada and get a winter crop. But even though forty-fifty years have passed since independence, there is no electricity in the villages along the river, nor is there river irrigation.

.... We have flowing water and good fodder in the forest. We don't live as much by farming as we do by our livestock. We keep hens, goats, cows and buffaloes. Some have 2-4 buffaloes, some have 8-10. Almost everyone has ten -twenty-forty goats.... From Gujarat people come to our hills to graze their cattle. Our fodder and water is so plentiful.

.... The forest is our moneylender and banker. In hard times we go to the forest. We build our houses from its wood - from teak and bamboo. From *ningodi* and *hiyali* (types of bamboo) splints we weave screens. From the forests we make baskets and cots, ploughs and hoes.... We also eat leaves from the forest, *hegva*, *mahia*, *amli*, *goindi*, *bhanjan* - all these leaves we eat. If there is a famine we survive by eating roots and tubers. When we fall sick, our medicinemen bring us back to health by giving us leaves, roots, bark from the forest.... We know the name of each and every tree, shrub and herb; we know its uses. If we were made to live in a land without forests, then all this learning that we have cherished over the generations will be useless and slowly we will forget it all.

.... We worship our gods by singing the *gayana* - the song of the river. We sing the *gayana* during the *naval* and *divasa* festivals, describing how the world was made, how humans were born, from where the great river came.... We eat fish often. Fish is our stand by when we have unexpected guests. The river brings us silt from upstream which is deposited on the banks... Our children play on the river's banks, swim and bathe there. Our cattle drink there all through the year for the big river never dries up. In the belly of the river, we live contented lives. We have lived here for generation after generation; do we have a right to the mighty river Narmada and to our forests or don't we? Do you government people recognise that right or not?

You city people live in separate houses. You ignore each others' joys and sadness. We live with our clan, our relatives, our kin. All of us pool together our labour and construct a house in a single day, weed our fields, and perform any small or big task as it comes along. In Gujarat who will come to lend us a hand and make our work lighter? Will the big farmers come to weed our fields or to construct our houses?



Here in our villages, from our villagers, why do we get so much support? It is because we are all alike here; we share a common understanding. Only a few are tenants; everybody owns land. No one has a lot of land, but everyone has a little bit. When we go to Gujarat, the big landowners will crush us. As early as forty-fifty years ago, they took away the land of the adivasis who used to live there. Even now they are doing this. And we strangers - we don't know the language or the customs; it is their rule. If we can't do the kind of farming that needs a lot of money, then we'd have to mortgage our land to them, and slowly they would take it over. If they took away the land of the adivasis who lived there, then why won't they take away ours? Then who will give us other land? This is the land of our forefathers. We have a right to it. If this is lost, then we will only get spades and pickaxes, nothing else....

Our village gods are all here. Our ancestors' memorial stones are all here. We worship Kalo Rano, Raja Panto, Indi Raja. We also worship Aai Khada and Khedu Bai. Our great devi is Rani Kajol. Her's and Kumbai and Kundu Rano's mountain is in Mathvad. If we leave all of them, then where will we get new gods from? People come from all over to celebrate our festivals - *indal*, *divasa* and *divali*. For *bhangoria*, all of us go to the market where our youth choose their own spouses. Who will come to us in Gujarat?

The land in Gujarat is not acceptable to us. Your compensation is not acceptable to us. We were born from the belly of the Narmada, we are not afraid to die in her lap.

We will drown but we will not move!

Bava Mahaliya

- In the Chapter Ideas on Development, we read that what is development for one might not be development for another. Use Bava Mahaliya's letter to explain this statement.
- Create a table identifying the current aspects of living and changes that will occur if the tribal people are re-settled in a different state on following aspects: Food habits; Farming; Finance; Relation with Forest; Religious practices; House making; Social relations.
- How is loss of bio-diversity being expressed in the letter?
- For the tribal people livelihood, cultural practices and social relations are deeply connected to the local environment. Can you explain?
- Do you think the people of Jalsindhi village are food secure in their present location?
- If you lived in the above situation how would you have responded to the demand for re-settlement?

Development projects like the Sardar Sarovar dam have disrupted the lives and livelihood of thousands of people. It is true that irrigation and power have been produced and both are central to modern development. But for people who have been displaced – and there are millions of them – modern development has been unjust and destructive. Because of modern development projects, they have lost access to their greatest resource, the local environment. This is a point that Bava Mahaliya makes over and over again. Without the local environment their lives would be reduced to nothing. From a state of self-sufficiency they would be flung into scarcity. Now they can at least take one crop, hope that, in future, irrigation would enable them to gradually move to multiple cropping. But with displacement, their lives would become dependent on external forces and they would fall into poverty.

For most rural communities, the link between the environment and the lives of the people is very strong. Access to the environment serves a large number of their needs (like food, firewood, fodder, economically valuable articles etc.) which otherwise they would have to pay for. As they lose access to environment either because of displacement, or the environment is destroyed and polluted, the poor are the greatest losers. The question of environment and sustainability is intimately connected to the issue of equity.

It is also important to realise that not only do people lose out as they are removed from their local environments. Equally, the environment is denuded of its rich bio-diversity as the traditional knowledge is lost along with the people. The stock of knowledge has been built and enriched over generations. People like Bava Mahaliya are the repositories of traditional knowledge. “We know the name of each and every tree, shrub and herb; we know its uses. If we were made to live in a land without forests, then all this learning that we have cherished over the generations will be useless and slowly we will forget it all.” Today when the

environment is endangered in multiple ways, it is important to understand the contributions that these caring communities can make.

The resistance to Sardar Sarovar and other dams with similar consequences in the Narmada valley has taken the form of a social movement. It is called Narmada Bachao Andolan (NBA). You will read more about the issue of displacement and the environmental movement that has built up around this and similar issues in the Chapter on Social Movements.



Fig 12.5 : Write your caption in the context of environment

## Chipko Andolan

Another important environmental movement is the Chipko Andolan which started in the early 1970s in the Garhwal Himalayas of Uttarakhand. Like the tribal people of Narmada valley, the forests are a critical resource for the subsistence of people in hilly and mountainous areas. This is both because of their direct provision of food, fuel and fodder and because of their role in stabilising soil and water resources. As these forests were being increasingly felled for commerce and industry, villagers sought to protect their livelihoods through non-violent resistance. The name of the movement comes from the word 'chipko' meaning 'embrace': the villagers hugged the trees, saving them by interposing their bodies between them and the contractors' axes. Village women were the main force of this movement. It inspired many people to look closely at the issue of environment sustainability.



Fig : 12.6

While each of these movements has slightly different contexts, they are essentially demanding the rights of the local communities over the environment. Chipko movement acted to prevent the cutting of trees and reclaim their traditional forest rights that were threatened by contractors. Narmada Bachao Andolan has stood for the rights of the people over land, forests and river.

- You have read about the protests against the Kudankulam nuclear power plant in the Chapter on Ideas on Development. Can you interpret the protest in view of what you have read here?
- “Environment protection is not just crucial for those communities directly affected but for all of us.” Explain with few examples.
- Revisit the class VIII chapters on Mines & Minerals in the context of Andhra Pradesh. What issues of conflict emerge between industrialists and people living in regions of minerals?
- There has been rapid increase in the extraction of minerals for domestic use and for exports to other countries since liberalisation and globalisation of Indian economy. Using figures from the table on the right substantiate the observation.
- What do you think would be the environmental and human costs of such rapid growth in mining?

Growth in Extraction of Some key Minerals in India (in thousand tonnes)		
	1997-8	2008-9
Bauxite	6108	15250
Coal	297000	493000
Iron Ore	75723	225544
Chromite	1515	3976

## Towards Sustainable Development with Equity

For long, policymakers have ignored the environmental issues. The argument has been that since developing countries like India are poor, developing economies need to grow. Development has to be achieved at any cost. Growth in GDP and modern industrial development are necessary, it is argued, for raising the living standards of people and reducing poverty. Since modern industrial and agricultural development are intensive in use of natural resources including energy, depletion of resources and pollution of the environment is to be expected. It is a sacrifice that has to be borne for higher growth. Once high economic growth and prosperity is achieved, pollution and environmental degradation can be handled. One can spend money and clean up the air and rivers, drink bottled water and build cars that are fuel efficient. After all this is the route the developed countries have taken.

This logic is wrong for various reasons. By now you would have realised that the environment is already in a disastrous state on various fronts. India is a big country with a huge population. If we continue to grow and consume energy and other resources and also pollute the environment as the developed countries have done, it would be catastrophic for earth. The damage to the environment will simply not be reversible. Hence, the idea that environmental damage is self-correcting is wrong. Besides, we certainly do not want the environment to be destroyed before it is reclaimed. Future generations, even if they restore the damage, they would have to spend crores of rupees to clean up the mess created today. For example to clean up our rivers and drains we need to spend money today besides ensuring that they are not polluted again. Do you think we should follow a path that destroys the natural resources and leaves them worse for future generations? Can we not perceive

the contradiction: we first encourage and celebrate a life style that invites the disease and then spend thousands on its cure?

We are already experiencing on several fronts the negative consequences of rapid economic growth – the problem of groundwater and pesticides being two stark examples. We have several thousands of communities living off the environment. To destroy the environment means to destroy these communities. It is unjust to ask the poor people to bear the cost of development.

Of course, this doesn't mean we don't progress. But we should be able to integrate environmental concerns with the idea of progress, along with issues of equity and justice. We have to find an environmentally



Fig 12.7 : Write your caption in the context of development

sustainable pathway out of poverty. It is not an easy task. And yet the beginnings have already been made.

1. Different groups have championed the rights of local people over the environment (chapter 21). They have been a major force in raising the environmental consciousness among people and shift towards sustainable development.

2. The courts have given a number of judgments upholding the right to a healthy environment as intrinsic to the Fundamental Right to Life. In 1991, the Supreme Court held that the Right to Life under Article 21 of the Constitution includes the right to the enjoyment of pollution-free water and air for full enjoyment of life. The government is responsible for setting up laws and procedures that can check pollution and introduce heavy fines for those who pollute. A variety of government

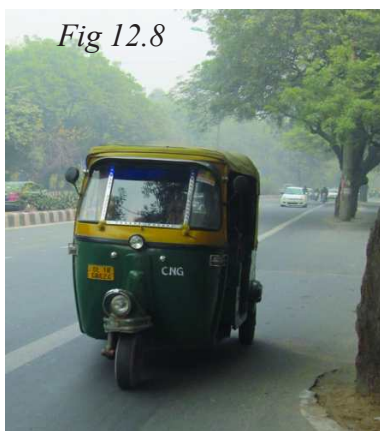


Fig 12.8

*Fig 12.8 : Emissions from vehicles are a major cause of environmental pollution. In a series of rulings (1998 onwards), the Supreme Court had ordered all public transport vehicles using diesel were to switch to Compressed Natural Gas (CNG). This is a cleaner fuel compared to diesel. As a result of this move, air pollution in cities like Delhi came down considerably. However, in the recent years the pollution levels have gone up again, because of the huge rise in the number of private cars run on diesel. Car manufacturers have started producing and selling cars run on diesel! The challenge of sustainable development is not an easy one.*

institutions have been started to play the regulatory role.

3. On issues like climate change countries have tried to reach collective decisions. Climate change affects all countries and people, some may be more than the others. Many of these effects we do not even understand, and cannot anticipate. Individually a country may take initiative to reduce emissions of green house gases. Its environment would however continue to deteriorate if other countries do not regulate their emissions. Thus, solutions at the global level with countries coming together become necessary.

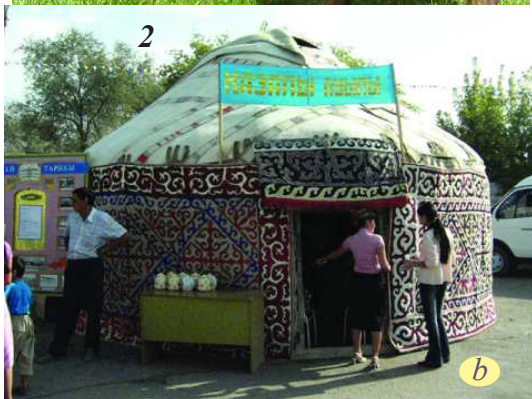
4. At the community level, many community organisations have innovated and re-discovered sustainable and equitable ways of doing things. There are numerous instances of such initiatives in diverse fields: fisheries, mining, transportation, energy, agriculture, industry, etc. Let's consider a few initiatives that have a direct bearing on society's most basic need, i.e, food.

In the area of agricultural production, you might have heard about organic products and organic farming. Organic farmers forego the use of chemical fertilisers and pesticides. Instead they rely mainly on natural techniques such as crop rotation, compost and biological pest control in farming. One of the main characteristics of organic agriculture is the use of local resources including on-farm biological processes such as availability of pest predators (birds, spiders,

insects) or soil micro-organisms (Rhizobium and Azotobacter) which make nutrients more accessible to the plant. The use of synthetic chemical inputs is minimised and farms can be bio-diverse as they produce a number of crops rather than only one or two crops. Furthermore, production levels can be maintained similar to modern agricultural methods.

Now many states have realised the need and potential of organic farming. Local level initiatives have influenced state policy. The Sikkim government has taken the bold step to ban chemical fertilisers and pesticides. It is the first state in India that is planning to shift completely to organic farming by 2015. Uttarakhand too is following the same path of being 100% organic state.

Another very interesting intervention on sustainable food production and its equitable distribution is the alternate PDS initiated by community groups in Zaheerabad area of Andhra Pradesh.



a. Massai warrior in Kenya  
 b. Yurta Kazakhstan  
 c. Qiang tribes in Tibet  
 d. Gaucho in South America

Fig 12.9 : In the year 2013 a new photography book called “Before They Pass Away” was published. We do not have access to the book. The author identified nomadic communities that are on the verge of disappearing. (Our images are from different sources.) As you look at them think of how and why the question of sustainable development will be important – and why did the author identify them as disappearing.

## An Alternative Public Distribution System

Of the total cultivatable land in India, 92 million hectares is rainfed area and 51 million is irrigated area. This means nearly 2/3rd of cultivable land in India is rainfed and may not be fit for irrigated agriculture. Traditionally, a mix of crops suited to the dryland conditions were grown in these areas. For example the dryland agriculture of the Deccan plateau had a mixture of 16 crops sown at the same time. These have varying maturity period which results in extended period of work and continuous supply of incomes and/ or food gave. This also minimised the risk factor, where at least one crop will give yield even in adverse climatic conditions. Mixed cropping also reduced the chance of any insect becoming a major pest. The crops were so chosen to provide balanced and nutritious food to the land (soil fertility), human population and the livestock.

However, with the green revolution emphasis shifted to rice and wheat. These were the crops that were also available through the ration shops under the PDS. The main cereal cooked at home changed to rice and wheat. As the demand for local foodgrains fell, over time many of the patches of dryland were left uncultivated. You may recall that under the Green Revolution rice and wheat agriculture was encouraged for food self-sufficiency through various government policies. Cultivation of millets on the other hand was neither encouraged, nor supported. There was not enough research on how to increase the yields of coarse cereals. This is the main reason why the production of dryland crops like millets and oil seeds suffered.

In Zaheerabad mandal of Medak district of Andhra Pradesh, villagers have reversed the dependence on purchased wheat and rice. It all began around the year 2000 as the women began to reflect on the loss of local food cultures. Millets were the traditional staple of the region, which had been lost to rice. Rice is nutritionally inferior compared to millets. Besides poor nutrition, people also realised that they had lost control on what grew on their land. Many fields were now fallow. Led by a voluntary organisation, Deccan Development Society, the villagers collectively decided to cultivate the fallow land and the commons. Millets were the obvious crop choice because of their suitability to the local environment. Millets are hardy crops and nutritious.

Cultivation of dryland gave people work. Further, instead of selling the produce outside, the community started community grain bank. This operated on the principle of the PDS system (like people hold different ration cards and are assigned fixed quotas depending on the type of ration card). Only it was locally managed, and the grain was the local grain. Instead of the grain travelling hundreds of kilometers, locally produced food was now available to ensure food security in the village.

## To sum up...

We noted that that modern development has accentuated the problems of environmental destruction. This is today felt in many ways and quite starkly. From development centered on growth of goods and services, the goal has to shift towards sustainable development with equity. Everyone has a role to play in this transformation – individuals, companies, farmers, governments, courts, voluntary and community organisations and international organisations.

### Key words

Sustainable development

Environment

Source

People's rights

Equity

Sink

### Improve your learning

1. Identify at least ten food items that you consume and find out how far they have travelled from their place of production to reach your plate.

S. No	Food item	Distance traveled
a	Rice	
b	Cooking oil	
c	Bananas	

Many people have argued for localisation of food production rather than food travelling long distances. How is localisation of food connected to the environment? Find out more about the localisation movement in food and organise a discussion and debate in the classroom. (If you have access to internet you may like to listen to following talk by Helena Norberg-Hodge available in youtube website: [https://www.youtube.com/watch?v=4r06\\_F2FIKM](https://www.youtube.com/watch?v=4r06_F2FIKM).)

2. Why did the people of Jalsindhi village refuse to move out of the village?
3. “This is the land of our forefathers. We have a right to it. If this is lost, then we will only get spades and pickaxes, nothing else...” says Bava Mahaliya. Can you explain the statement?
4. “Last, but not the least, the key to environmental problem lies in changing lifestyles that will minimise waste and pollution.”
  - What are the various ways in which our lifestyles affect the environment? Use examples from your own context to explain.



- Find out about the various ways in which the problems of garbage and emissions are being dealt with around the world.
5. Rapid extraction of minerals and other natural resources would adversely impact the future development prospects. Do you agree?
  6. Why do you think the effects of climate change may be felt by all countries?
  7. Should the average temperature of the earth be treated as a natural resource for all people?
  8. What are the lessons to be drawn from the alternate PDS initiative at Zaheerabad mandal in Andhra Pradesh?
  9. “Environment is crucially important for the lives and livelihoods of the local communities and the lifestyles of local communities are harmonious with the environment.” Explain.

## Project

You have read about composting in the context of organic farming. Here is a simple method that you can try out in your school and home.

- Take a large size container and make several holes for water drainage.
- Layer it with coconut fibres for drainage.
- Cover it with a thin layer of soil.
- Add vegetable wastes in a layer.
- Add another layer of soil.
- Again add vegetable wastes in a layer.
- Cover with soil.
- After one week, introduce earthworms in it.
- After decomposition, use the soil to make a small garden with plants of your choice.