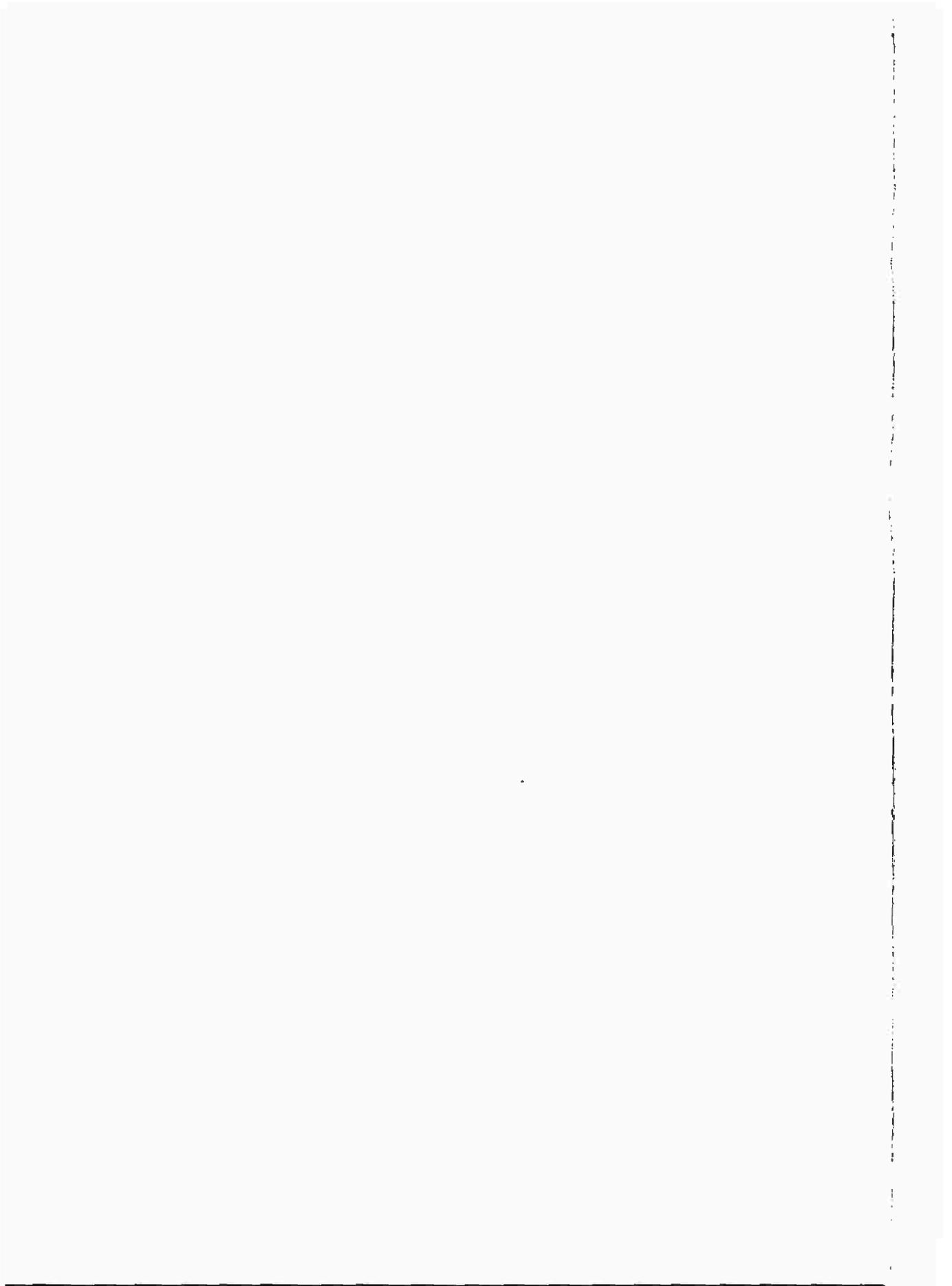


*Developing Countries
and Environmental Geographical Issues*

Dr. Abdullah R. A. Al - Kandari
Vice Dean
College of Graduate studies
Kuwait University



1) Introduction :

People are now very concerned about the environment, there is evidence that the world is beginning to wear out as exemplified by hole in the ozone layer which protects us from the damage by the sun , for example.

The environment is not just a problem for the west . Ex-Soviet countries are in trouble too. Poland suffers from very polluted rivers, in its industrial areas. Cities in the Czech Republic have very polluted air .

Pollution may destroy areas which are very important environmentally. An example is Lake Baikal in the Former Soviet Union which used to be home for many rare plants, birds and animal.

Cities in developing countries are also suffering especially from air pollution. Examples include Mexico City in Mexico and Sao Paulo in Brazil. The poorest countries in the world do not have enough money for proper drainage, sewage and rubbish disposal and this causes more pollution. These countries are also very short of resources like coal, minerals or fertile land. The scarcity of resources and high demand have often led to over-exploitation. Lack of adequate fertile land, for example, has led to over-cultivation and the available land is not allowed time to recover after each harvest. The soil "wears out" and becomes useless. Sometimes more overcrowded and polluted.

Even now nobody knows exactly how harmful pollution can be.

Nobody knows if the earth will be able to cope with the pollution naturally so that humans will not be affected, or whether the Earth will no longer be suitable for human life.

Humans want higher standards of living. This means consuming more goods and services. It also means that more goods will have to be produced. Therefore more valuable resources will be used up. Most of these resources cannot be replaced, oil is one such example. Therefore people cannot expect to have higher standards of living for ever. If we continue to produce goods in the same way. There may be ways to produce goods using fewer resources. This would allow us to continue for longer, but more research is needed.

The area of Economics which deals concerned with the environment is a very new subject. The effects which pollution will have on our planet are unknown. Nobody, has created a set of standards which can be used to evaluate our action, and indicate, for example that "Option A is bad. Option B is good, Option C is best for the environment". Most economists still use "Neoclassical Values", which they regard as the best and most profitable options. They do consider the effects these may have on the environment. Economists should recognize that there are other approaches which can be taken towards solving any problem. Furthermore, economists who are concerned about the environment must also realize that experts in Biology, Chemistry, Physics and Geography will have valuable things to say about the problems.

2) The Nature of the Problem :

In all countries nature relies on man to preserve it, and man relies on nature for his resources. In developing countries this relationship is especially strong. For example : the trees in a forest protect the soil from being washed away, and their leaves fall & decomposes making the soil fertile. As trees are chopped down to make way for big agriculture projects, timber manufacturing or fire wood, the quality of the soil suffers. The soil is exposed to the sun which bakes it hard and the wind below away the fertile top layer. The soil no longer absorbs water. It becomes useless for agriculture, and the risk of flooding is increased. Man damaged the land by removing trees and because the land is damaged he can no longer benefit from it.

Our example involves trees. Which are a "renewable resource", they can be replanted and replaced. But if they are over used, it too many are chopped down, the damage could become irreversible. If renewable resources are not treated with care, they will eventually disappear for ever.

Developing countries have fewer resources than developed countries. They have less money to import resources if they need a lot. Developing countries may be tempted to over use their resources. This means the non-renewable resources will not last as long, and that irreversible damage may be done to the renewable resources.

Our example demonstrates that damaging one resource also effects other resources. In our case, damaging the trees also damaged fertile land. This makes it even more important not to damage a resource which affect another resources.

Renewable resources are called "renewable" because once used they can grow again. However there is a natural rate of growth. If the rate at which the resource is used is greater than the natural rate of growth, the amount of the resource will shrink. Fish supply is a good example. Fish breed naturally at a certain rate. If the adult fish are removed by fishermen at a faster rate than they can reproduce themselves, permanent damage will be inflicted on fish supply. Over use of resources damages their ability to renew their ability to renew themselves.

3) The Environment In Developing Countries :

Environment issues in the Third World are not viewed in the same way as they are in the industrial countries. Very little importance is attached to the concept of 'countryside' as a rural idyl, the term is more likely to be associated with poverty and repression. For example, agribusiness in the developed world is often opposed by leisure consumers of the countryside. In the South, 'quality' of the countryside is not regarded as reason for opposing agribusiness although environmental effects (erosion, siltation, ecosystem destruction etc.) are

often worse. (Marc Blang's 1990).

In these areas, development problems are environment problems; food supply is often insecure and population growth increasing, Housing, food and other development needs must come first, taking priority over pollution controls.

Following development environmental action increases but in most developed countries this action follows class lines. Hence the affluent are concerned with atmospheric pollution, noise, traffic congestion etc., while for the less well off sectors of society other, more immediate environmental issues take priority (water pollution, housing, disease etc.) since the problems may be life threatening.

4) Structural Linkages between Poverty and Environment :

Rural poverty can be seen either as structural (socio-economically derived) or as a result of resource depletion. Both explanations have some truth in them but reality is more complex. An integration of the factors involved in both these explanations is more complex. An integration of the factors involved in both these explanations can lead to a better understanding of the active process of under development. The different approaches to the problem of rural poverty arise from two perspectives. One focuses upon underlying dependent causes and the other is more concerned with the effects of poverty. Authors such as De Janvery and Bernstein provide examples of the former approach,

describing the process of underdevelopment and its connection with poverty (Hamrin, R. D., 1980). The rural sector in Third World countries is more vulnerable to market forces because of the low level of development in the production process of peasant agriculture. In order to produce more commodities for the market in the developed countries, peasant farmers may start to develop more & more marginal, regions and thus increase the chances of soil erosion and desertification. Although the results of market surplus (as opposed to subsistence) production vary from region to region, the costs of externalities will largely be borne by the developing countries, rural poor. (Turner, R. K., 1988).

The other perspective focuses upon the effects of poverty, believing that development does not necessarily lead to poverty in rural areas. Many international bodies and aid agencies take this view (e. g. the ILO, International Labour Office) since they are more concerned with effective policy decisions than with determining the theoretical background of under development. The problem of poverty is essentially seen as an employment problem with the majority of people in the Third World unable to find remunerative uses for their labor. The poor in these countries are unable to control the redistribution of income without which development is impossible.

Both approaches to the question of poverty are structural in that they focus on the way the market allocates goods and income.

Structural processes and the environment are linked in that both population pressure and land distribution are involved in the way the poor have recourse to their environment. Serious rural poverty often occurs in resource poor environments like the high Andes and the Sahel. It is difficult to attribute poverty to the environment alone, however. There is poverty in fertile areas of Bangladesh & India in the Andes and the Sahel poverty can be seen as partly a result of marginalisation of poor from the land. Thus the relative position of the poor in an international context must be considered in the question of poverty and the environment.

5) Global Resources and the International Economy :

North-South economic relations contribute to environmental problems in a number of ways :

- i) Individual in developed countries use more resources than individuals in developing countries.
- ii) Economic demands of developed countries must be met by the resources base of the south.
- iii) Industrial countries rarely recycle their waste. For example, in 1977 the US generated 13001 billion square of municipal solid waste per capita. In less developed countries, however, rubbish tips often provide a resource base in themselves.

The prescription for change in the international economy is usually to encourage more North-south investment and better protection of economic interests in developing countries. The unequal exchange of investment and resources is not merely between North & South, however. Within the Third World, 70% of investment is confined to 15 countries with over 20% in Brazil & Mexico alone. (Pigon, A., 1991).

The scarcity of natural resources is not as important a factor as the immobility of resources. Their immobility results in the penetration of transnational companies into the Third world (in the form of assembly shops and chemicals plants for example). Energy and raw materials are diverted towards satisfying the demand for hi-tech goods in rich countries while labour is used to maintain existing inequality (Repetto's R., 1986).

6) Dependence on natural Resources.

A) Fuel :

woods is an important source of fuel in developing countries. Wasted parts of crop (such as stems, roots) are also used. Of all developing countries, nepal is the most dependent on these "Traditional fuels. 93% of nepal's fuels comes from wood or crop waste. The countries which are most dependent on "traditional : fuels are usually the poorest countries. Therefore looking at statistics on sources of fuel can tell us how poor a country is. (Cornard, J & Clork C., 1987).

so many developing countries depend on wood and crop waste for a large amount of fuel. Therefore if pollution or over-use damages these resources the countries will be heavily effected. The poorer the countries the less money they have to import replacement fuels (e. g. oil) and the more affected they will be. Statistics show that if poorer countries continue to use their fuel in the same way, their resources will very quickly run out. The United nations estimated that Haiti lost 59% of its forest between 1956 & 1977. 70% of haiti's fuel covers from wood, so the country will suffer badly when it is used up. Measures are being taken to conserve the forest. (Dorfman, N & R, 1977).

B) water :

Water is vital. Humans and animals need it to drink, Mining & manufacturing industries need it in production. But 70% of the world's water is used for irrigation. Developing countries are highly dependent on water for irrigation because they tend to be located in hotter areas. Egypt uses 91% of its water for irrigation, the most of any developing countries. It is therefore very important not to waste water. (Dasgupta P. & Heals G., 1979).

C) Other Resources :

Trees are important for animal fodder. Crops depend on animal manure and crop waste. Many medicines are discovered in plants. Forest provide building materials. Managing natural resources is

important if they are to be conserved for use in the future.

D) Links Between Resources ;

Land resources (trees, pasture etc.) are closely linked to water resources. In developing countries the links are even closer than in developed countries.

An example : Chopping trees reduces availability of firewood. But this is not the only effect. Tree leaves protect the soil from the impact of heavy rainfall. Treeroots hold the soil together. Without trees the fertile topsoil is washed away. Soil is exposed to the sun and is baked hard. Rain is no longer able to soak into the soil. Rain runs off the surface of the soil, sometimes causing flooding. The rain water cannot soak down to the springs. Some of the springs will run dry. The rain water cannot soak through to rivers. Some river will run dry (bohi, D & toman, M., 1983). By damaging a land resource (trees), a water resource has been affected.

7) the Economic cost of damaging Resources.

The loss of resources has obvious environmental cost, but it also involves economic cost.

Fuel wood may be used as an example. If forests are cut down, fuel wood becomes scarce. Those who want fuel wood will have to forward further to get it. This will take more time and time is

economically valuable. Time spent traveling in search of fuel wood could have been more usefully spent making goods or providing services. If laborers have to work further to collect fuel wood, they will be tired during their work and will work less well. If fuel wood is scarce people will use animal dung and crop waste as fuel, instead of using it as fertilizer on the land. Crop production may fall and farmers income will fall. (Broadway, R & Bruce, N., 1984).

If trees are chopped down the soil is not protected from rainfall. Tree roots do not hold the soil together. A lot of soil is washed into rivers. The rivers carry this soil down to the dams. This can cause damage to the dams which is expensive to repair, and less electricity will be produced until the repairs are completed.

8) Measuring Environmental damages and the Total Economic Value.

It is very unlikely that markets will correct for pollution on their own. Some form of regulation will be required. Regulation may be used to try to achieve a calculated "optimal" level of pollution, or merely to try to reduce pollution levels without aiming towards any "optimal" level.

If one affects toward determining an "optimal" level of pollution, are to be made no calculations of the economic losses of the pollution will be necessary. In this case it would probably be best to try to reduce the

pollution to an acceptable level for the health of the population. Taxes and permits would probably be effective.

If attempts toward reaching an economically optimal level of pollutions calculations are required.

The economically optimal level of pollution occurs when the external loss of producing one more unit of pollution (The Marginal External Cost) is equal to the benefits of producing one unit of pollution. (The marginal net private benefit). Therefore to calculate the optimal level of pollution involves calculating the money lost to the producers for producing some more unit of pollution, and the money benefits which the produces gets from producing one more unit of pollution. The produces will already know how much money he receives from producing one more unit of pollution. This will be the amount of profit he receives from making however many goods involve the creation of one unit of pollution. Putting money value involve the creation of one unit of pollution. Putting money value on the damage caused by this pollution causes is more difficult. (Brookshire, D, Eubark's, L. & Randall, A., 1991).

Some may regard putting a money value on environmental damage as immoral, but we are using value only to indicate the loss of welfare the damage has caused. In the same way that the price of a box of corn flakes is an indication of how much we are 'willing to pay" for the

cereal. So we can use money to indicate how much we would be willing to pay for the environment - a measure of its value, which reflects as preferences. Clearly this is an imperfect way of showing how much people care for the environment, but it appears to be the best way economists have found.

The Uses of Economic Value.

We already mentioned that one use of economic value is to enable us to compare it with benefit to the producer and thus to calculate the optimal level of pollution. Economic value measurements may also be used to show the importance of environmental policy. The gains from environmental policy are not just immediate monetary benefits, they are gains in quality of life which may not be measured in money terms.

Traditionally, gains which are measured in money terms are those which benefit private individuals or distinct group^s of people. Those gains which benefit areas not under private or public ownership - the air, water, landscapes - are not measured by money. This is because no money transfers between pollutes and polluted take place. Just because they are not measured in money, they should not be seen as less important. Attempting to give money value to these gains or losses would however make it easier to access them. For example, by applying money value to environment damages in Germany (1983 - 5) it is possible to see that the lost of the water pollution to the ground water

resources was 30 times the cost of water pollution to freshwater fishing resources. It is also possible to see that in 1985, pollution damage was costing an amount equal to 6% of FDR's Gross national Product - a significant sum. Money value may also be given to estimates of environmental damage avoided by sound policies. For example, the USA's environment policies reduced environmental damage equivalent to 1.25% of GNP in 1978 (Smith, K. ed., 1989).

Cost, Benefits, Willingness to Pay & Willingness to Accept.

Giving a money value to environmental damage gives us an indication as to whether or not environmental protection is worth investing in. Expenditure on environmental important is worthwhile so long as the extra benefits of the improvement units outweigh the extra costs. In fact expenditure will take place until; all the possibilities of gain are exhausted; until extra costs equal extra benefits. (Marginal cost = Marginal benefit).

The aim of assigning money value to environmental benefits is to allow us to take action on people's preferences, and ensure that the environmental features at the top of their preference list are given top priority. We take individuals willingness to pay as an indication of their preferences. The more they are willing to pay, the higher in the list of their priorities that factor should be. Not everyone has the same preferences. Economists and environmentalist are concerned about doing the best thing for society.

The willingness to pay value which used to assess the value of environmental benefits is an aggregate figure. Some members of society would be willing to pay more than that amount to secure particular environmental benefits. They value these environmental benefits more than the market price. We have assigned to them through the aggregate willingness to pay figure. These people receive more benefit than the market price indicates - they enjoy a "Consumer Surplus".

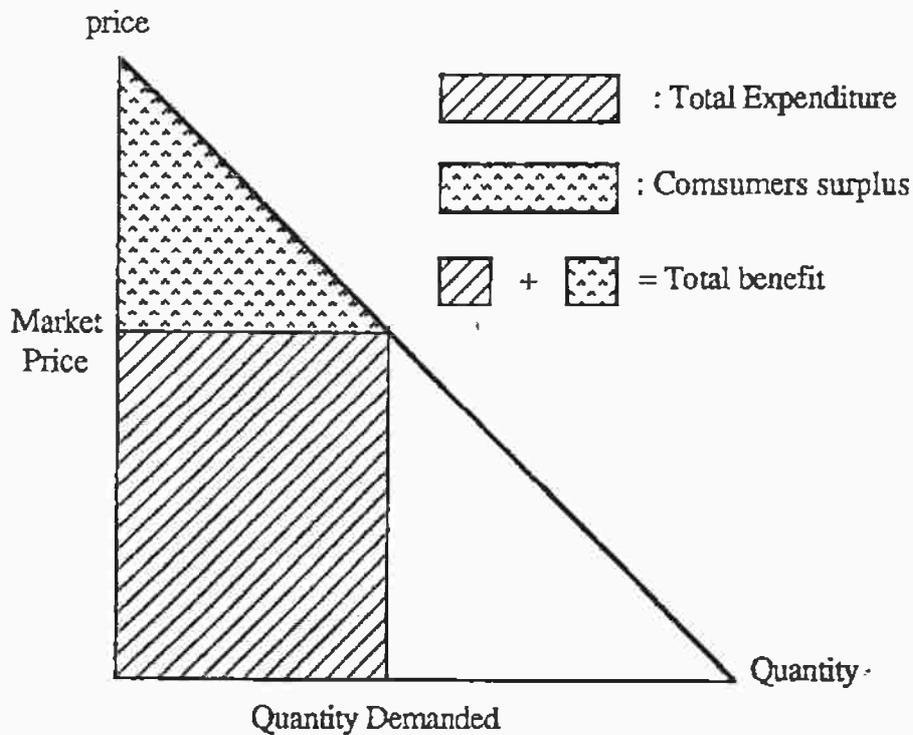


Fig. 1 a demand curve for environmental goods.

In order to take account of people who are willing to pay more than market price for environmental benefits, we must include

their consumer surplus in our calculation so that

Gross Willingness To Pay = Market Price (Indicates Basic Willingness to pay) + Consumer surplus.

If we use gross willingness to pay in our evaluation of environment benefits we have a more accurate indicator of the value society places on them. (Pearce, D Turner, K., 1990). The market price can be identified by the supply and demand forces, because it is not possible to change a separate price to each and every individual buying the good, see fig. (1).

If the market price of a good fall clearly the consumer enjoys an increase in consumer surplus an increase in benefits we could therefore ask the consumer how much he would be willing to pay to gain that benefits.

There is another way of looking at this. We could equally ask the consumer how much he would be willing to accept to forget this increase in benefit. This would mean the consumer agreeing to compensation for less of benefit.

9) Managing Resources.

If we are to persuade government that managing natural resources is important we must show the economic arguments. The most important department in any government is the treasury and if we can show

them that careful management of the environments will make the country more efficient, changes may be made. But how can we give incentives for producers to look after their natural resources? Prices of agricultural goods in developing countries are often less than those quoted on the world market. If governments allowed prices to rise closer to world price levels producers would receive more money. They could be given incentives (e. g. government / UN aid) to invest in resource saving technology. This would make producers more efficient and may increase the amounts produced. However there is no guarantee that raising prices to give producers more money will help conserve natural resources. Producers may choose to keep the profits instead of re - invest them. They may choose to invest profit in more production leading to even more use of natural resources. (Hotelling, H., 1990).

In developing countries there is normally a small number of men who are extremely wealthy and looking for place to invest their money. A lot of developing countries have currency restriction laws which make the investment of large amounts of money abroad illegal. Those with wealth do not have many options for investments. The options that do exist receive a lot of money and expand rapidly, and example is livestock ownership. Such expansion may cause natural resources to be used up more quickly. In the case of livestock, more trees are cut down for grazing land. Improving the stock exchange in the country will provide many more options for those with wealth to invest thus reducing pressure on natural resources.

In many developing countries government policies lead to over-valued exchange rates. This means that when producers sell their products abroad and convert the foreign money they receive into domestic money, they lose money. Over valued exchange rates reduce producers profits. Producers have less money to invest, and increase efficiency. If exchange rates were not over - valued producers would get more profit and would be able to make this invest saving natural resources. However, there is still no guarantee that these profits will be spent on resources conservation (Kerry, V, Kritilla, J. eds, 1982).

A lot of the agricultural land in developing countries is owned by large landlords who rent out smaller plots to farmers, consequently the farmer have little incentives to improve the land because it does not belong to them, and they may be moved off it. Government policies should take the land away from the large landlords and distribute it to the individual farmers. In the same way land which is owned by no - one in particular is not treated with care. Selling it to a user makes an individual responsible for it. So the resources will be more carefully looked after.

10) Conclusion.

- * Pressure on resources is greater in developing countries because they are more scarce.
- * This increases the temptation to over - exploit these resources.

* This temptation should be avoided because over - exploitation of exhaustible resources means they will run out more quickly and over - exploitation of renewable resources reduces their capacity to regenerate.

* Damage to resource had real economic costs.

* Managing resources to prevent damage to them is essential.

Recommended strategies include : -

@ Improving the prices of agricultural goods.

@ Not over - valuing exchange rates.

@ Improving securities of tenure for small tenants farmers.

These measures are intended for improving the means/as an incentive to improve resource management.

* We need to assess Total Economic value in order to compare the losses resulting of pollution with the benefits derived from the polluting activity, and therefore determine the optimal level of pollution which we should aim at.

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