CONSERVATION AND DISPOSAL PROBLEMS ON PRINCE EDWARD ISLAND

INTRODUCTION

The public is coming to view conservation as a field in itself. The proposed Water Act, and the recent banning of D.D.T. have created a greater public awareness of the need for conservation, and of the many detrimental byproducts that are a result of the nation's so-called economic progress. Too many times, people, seeing no limit to their resources, exploited them to a critical level. Only now are they beginning to realize that there must be another stage to the production-consumption cycle. That is the stage of conservation and disposal.

Under a capitalist system there is automatically a tendency toward resource depletion due to uncertainty about the future. In P.E.I. uncertainty certainly exists. For example, there is uncertainty with respect to produce prices, and uncertainty in the area of land tenure. It will be the purpose of this paper to examine the situation which our economic society has created, and to relate economic theories on conservation and depletion, and some of the economic forces involved to major problem areas on P.E.I. The problems of roadside erosion, sewage treatment, and land tenancy will be dealt with. We will discuss what is being done in these areas, and make suggestions where we feel policies should be improved.

THE MEANING OF CONSERVATION

Before concentrating on some relevant economic problems, let us examine what we mean by conservation, and attempt to classify the resources that we are dealing with.

The economics of resource conservation takes the traditional idea of allocating resources in such a way as to maximize returns at a given time period, and emphasizes the allocation of resources over a projected time period. It recognizes that it is uneconomical to ignore the effect of your present utilization plan on your future resource situation. Very generally, conservation emphasizes resource utilization in the direction of future tme periods, while depletion takes place if resource use is concentrated in periods close to the present. However, to be more specific we must consider conservation in terms of a total planning period whch may be twenty or thirty years. Conservation means a redistribution of use rates in such a way that the return over the total time period will be maximized. This could involve an increase of use rates near the present, but this would not be the usual case.

Conservation covers a very wide field, and can include such things as finding substitutes for resources presently in use so that their eventual loss will not prove too detrimental, or decreasing the amount of inputs used to reach a certain output. Before leaving the meaning of conservation, it is important to note that conservation might not mean efficiency, since the money and materials used for conserving one resource could be better spent in other areas. For example, conserving a resource which appears to be becoming obsolete is highly inefficient. If a farmer tries to restore depleted or eroded soil, so that it can be used again for crop production, his efforts will be in the field of conservation, but they may be wasteful in that the money might be better spent if he bought more land, or increased his herd of cattle.

CLASSIFICATION OF RESOURCES

Now let us classify resources and briefly apply this classification to the resources we are dealing with. S.V. Ciriacy-Wantrup in his book, **Resource Conservation: "Economics and Policies"**, uses a classification that we shall adopt here. He divides resources into stock resources and flow resources.

Stock resources are resources which do not increase in amount with time, or increase so slowly that the increase is not economically significant. Thus, the more of them you use now, the less there will be in the future. Resources like coal and oil fit into this classification. It is interesting to note that a stock resource may be inexhaustible economically speaking since ti may be economical to use only very small parts of the resource in a period. Salt approaches this case.

ROADSIDE EROSION

If something is a "flow" resource, different units become available for use in different intervals" and thus the resource is naturally replenished. Ciriacy-Wantrup divides flow resources into those that are not affected much by human action (i.e.: the tides), and those where human actions can affect the amount of the resource left in a future time period. This latter class is especially important to use, and deserves more evaluation. It can be separated into those resources which have a critical zone, and those which do not. The critical zone is the lowest level at which a resource can be renewed. If the level of the resource falls below the critical zone it cannot be renewed. The critical zone may, at a given time period make a resource either economically or technologically irreversible. In other words, either it is not economical to restore the resource, or it is impossible. Wildlife is a typical example of a flow resource with a critical zone. If the number in a species once falls to zero, that species is extinct forever. In this case, we have technological as well as economical irreversibility.

The resources we are dealing with are stream water, harbour water, soil, and land. Stream water could be classified as a flow resource with a critical zone. Continuous rains renew the resource, however streams can become so polluted that although they could be cleaned up, the benefits would often not be worth the costs. Harbour water could either be viewed as a stock resource that undergoes very little change, or as a stored flow resource. In either case it would be technologically possible to replace the water, but it would probably not be economically feasible. Soil presents a more difficult case. Basically, it is a composite resource; some of its elements are flow, while others are stock. Many of its minerals are stock, but Ciriacy-Wantrup notes that as "a practical first approximation, it is meaningful to measure the use of the composite resource soil in terms of the flow of plant production." When classifying land as related to land tenure and land development, we must concentrate on the surface of the land. Obviously, this is limited so we can say it is a stock resource.

ROADSIDE EROSION

Roadside erosion is a process whereby topsoil on the shoulders and sides of the highway is removed by natural agents such as wind or rain. Some types of soil are more susceptible to this process because of their textures. P.E.I. has a type of soil which is very easily eroded. Although erosion can be beneficial, roadside erosion is almost always very undesirable.

The problem has been known and discussed for many years. Lots of pictures have been taken, and several complaints have been made. The results have been nil. Recently, federal government workers made a survey of the roadside along the portion of Route 2 which lies in Prince County. Erosion was taking place almost all along the highway, and was due largely to the simple fact that the government had not seeded the highway. Much of it was sheet wash erosion, or small gully erosion up to a foot deep. However, at stream crossings erosion was especially serious, and was often found to be well over two feet deep. Here, in additon to a lack of seeding, improper construction was probably also a cause. Most of the erosion was found on roads paved in the last four or five years. Although sources felt that the reason for this was that it took that long before natural vegetation can often take well over a decade to establish itself, and that one of the reasons why most of the erosion was found on very recently built roads is that in recent years the highways being built are much wider with consequent wider slopes and shoulders. Roads built today have a much broader expanse of top soil being exposed, so more erosion takes place.

THE COST-BENEFIT ANALYSIS

It was noted that the obvious cure for roadside erosion is seeding. It is necessary to seed discriminately, planting grasses which have the property of holding soil. Let us examine a basic economic tool in analyzing the advantages and disadvantages involved in the question of seeding. It and disadvantages involved in the question of seeding. It is called the cost-benfit anlysis, and involves examination of the direct and indirect costs and benefits of a certain program or of not having that program. Here we will concentrate on the costs and benefits of seeding, and of not seeding. What are the costs of not seeding? One direct cost is obvious. The washing away of shoulders, cracks in the pavement, and the weakening of the highway naturally necessitate highway repair. A note on some of the Island photos that we have examined is in keeping here. We have seen a picture where the soil directly underneath the highway itself had been washed away. Another interesting shot

A NEGLECTED ROAD

showed an instance in which the government built a guard rail, and then failed to seed the roadside, so that erosion led to the side of the road being washed away. The guard rail was left in midair, and the Department of Highways was forced to come along and put up another one. The cost of highway crews, and the materials and equipment involved must surely be greater than the cost of seeding which is very cheap.

The topsoil which is being carried away frequently runs into streams and causes siltation. Siltation immediately lowers the quality of the stream because it covers the rocky gravel spawning areas trout require in order to reproduce. This disturbs the fish cycle and obviously hurts the fishing in an area. A P.E.I. Conservation meeting in November suggested that seventy to eighty per cent of the streams in West Prince County were unfit for fish. What one means by unfit si very debateable, but at least this statement suggests that the problem is serious. The public is bearing the social cost of a decrease in the calibre of recreational facilities, and there is no doubt that roadside erosion is one of the causes of this problem.

Roadside erosion can be very costly to the farmer. Siltation of the streams is obvously undesirable for him. Moreover erosion along the road may cut into the banks of his fields making several yards of land unfit for use. If a farmer had many acres of land along the road the damage from erosion can become quite serious, and is certainly costing the farmer money.

An aesthetic cost is also involved here. A dirty eroded highway spoils the look of many pretty spots and nicely painted houses. Many of the weeds that eventually do grow up also look bad. All of this is certainly an eyesore to the tourist who travels our roads in the summer. Moreover, spraying of weeds may bring complaints from farmers whose crops might be affected.

An important indirect cost of not seeding must be considered. It is the socal cost that will have to be born by the taxpayers to repair and rectify the situation if seeding is not done now. In other words, it will consist of the increase of future costs over present direct costs as a result of erosion resulting from a lack of seeding at this time period. If the cost of not seedng at time period one is x dollars, and at time period two it has risen to x + y dollars, then the indirect cost at period one is y dollars. Thus the cost of not seeding now can be greater than first appearances might suggest.

Are there any benefits from not seeding? There is the very temporary small gain from still having the money which would have been used for seeding. As has been shown, over a period of a few years this does not prove to be a gain at all, but rather a very costly mistake. We do not think that any statement to the effect that the budget is tight, and that he money which would be used for seeding could be better put into other areas would be justified. The government could surely build one mile less of road, and seed the sides of the roads built.

To be fair, we must naturally examine the costs of seeding. Two informed sources have estimated the cost of the initial seeding at approximately one hundred dollars a mile. This is very small indeed, when you consider that the cost of a highway built to all-weather standards has been estimated by informed sources at about one hundred thousand dolalrs a mile. Other maintenance costs are involved, such as mowing and reseeding. However, these are small when compared with the great costs which can result from not seeding the roadsides.

Roadside erosion due to careless government action is an example of an imbalance of property rights which arises