

due to interdependence of property rights (i.e.: action by government on their property affects the property of owners along the road and of many other taxpayers). An imbalance of property rights exists in that the government, the agent responsible for conservation decisions in road development, does not take into consideration all the costs which accrue to other members of the public.

Other provincial governments in Canada are sensible enough to seed. The obvious benefits of avoiding growing highway repair costs, of decreasing the loss suffered by farmers due to erosion of their fields along the roadside, of improving the recreational pleasures which our streams provide, of improving the aesthetic qualities of our countryside, and of avoiding the social costs which will be incurred in the future if seeding is not done, are far too great to be ignored. It is the duty of the Department of Highways to rectify a highly undesirable and most unnecessary situation, and to do it in the very near future.

LAND TENANCY AND LAND DEVELOPMENT ON P.E.I.

Tenancy, here, refers to the relationship between the owner and user of land resources. The tenant uses the land, and is confined to the rights granted by the owner. Important to conservation is disposal and utilization restrictions, or even the fact that such restrictions may be applied. These restrictions are usually advantageous to conservation if they are properly laid down. There is a much greater chance for imbalance of property rights between owners than between tenants and owners near the land that the tenant is renting, when one is dealing in the area of disposal. One property owner may often be incapable of preventing the actions of another property owner which are detrimental to him. If a farmer dumps pesticides in a stream, his actions can affect other properties which the stream may flow through. The full direct and indirect costs are rarely considered. However, the owner can control what the tenant may do.

An imbalance of property rights does, however, exist in the tenancy system since the tenant usually only considers the revenues and costs that will affect him directly. Clearly, this can lead to depletion. The closer we can come to creating a situation where the tenant will act like the owner, the better are the opportunities for conservation. This could be done in two or three ways. One method is better compensation to the tenant for careful use of land, and for costs the tenant has incurred which are still providing benefits when the tenancy ends. Examples of such costs would be costs involved in applying manure and fertilizers, costs for liming, terracing, seeding, and plowing, and depreciated costs for the improvements and tenant has made such as fence repairs or new buildings. Such compensation will also help to induce the tenant to make improvements which he otherwise may not have made. S.V. Siriacy-Wantrup, on page 153 of his book entitled, **Resource Conservation: "Economics and Policies,"** notes that this system is presently used in Germany. It is important to state rates of compensation in tenancy contracts, and to set up a system for calculating the benefits tenants have made to the property.

A fairer rental system could also be achieved if rents varied to a certain degree with prices in the market or the gross revenues of the tenant. For example, depressed prices in the potato market would mean that the farmer who had rented land for growing potatoes would pay a lower than usual rent for the land. If depressed prices are not matched by a lower rent, the farmer will try to maintain his income by producing more, and his high time preference for the present will lead to depletion. Naturally, if market prices were high the rents would be higher. A system like this is used in California agriculture.

INSECURITY OF TENURE

Insecurity of tenure is an important factor which upsets the incidence of revenues and costs on the tenant and the owner of a property. If leases are short, and if the tenant is not sure if his lease will be renewed, economic uncertainty is increased, and the tenant sometimes tends to mine his land rather than carry out proper conservation practices. Obviously, the shorter the lease, the greater the tenant's time preference for the present, and the more likely one is to have depletion. If a farmer has a short lease, and is not compensated for improvements he makes, he will be reluctant to do such things as fertilize his land if this fertilization will benefit a time period beyond the end of the lease.

Local customs and traditions are important in tenancy, and in cases on the Island where this exists, stability is usually high since the tenant generally knows from past experience that his lease will be renewed even if it is a short period lease. Unfortunately, most of the leases on the Island are short in nature (a lot of them run from two to three years). The Land Development Corporation, which is really a land bank for the Island, will no doubt remove much of the instability. The longer leases that should come into effect will help a great deal. On page 37 of the booklet entitled "Development Plan for Prince Edward Island", we note that "Trained farmers, willing to accept continued management advice, will be able to lease land on a renewable five year lease option at the rate at which the Province borrows from the Federal Government under the Plan plus costs, or alternatively to take title, giving back to the Corporation a mortgage written on the same payment terms and rates as given by the Farm Credit Corporation." The government hopes to buy land from those who wish to leave

the farms, improve the land if necessary, and then lease it or sell it to qualified farmers who are starting or who wish to expand. Hopefully the LDC will be able to get the good farmers on the best land, will consolidate the land into bigger units, and will be able to gradually eliminate the confused tenancy system that presently exists on the Island. A tenancy map survey in West Prince County revealed the great number of farmers who were trying to expand by buying or renting little blocks of land wherever they could get hold of them. The map is a criss cross of arrows running from farmers' homesteads to the properties they own and rent, and if the market is left to adjust itself, proper reallocation will not be achieved, and the situation will grow worse as expansion becomes more and more necessary.

LAND REALLOCATION

Massive reallocation will be necessary in many cases. Often a lot of class two and three land is not being used by commercial farmers (people who make \$3,750 per year (gross) from farming). Interviews with those involved in a socio-economic survey of the property owners on the Island and of the lands that they hold showed that there were many people who were making most of their income in a non-agricultural capacity, but had good land. Clearly, a terrible opportunity cost is evident in these cases, and the government has a difficult task ahead.

Many farmers now have a choice that they have never had a chance to have before. They will be offered the market value of the farm land and buildings that they own if they wish to leave, and if they wish to stay but to stay in their area they will be allowed to keep their house, and an acre of land which they will lease from the province. How effective the reallocation plan will be remains to be seen. Certainly, we can see the possibility that the government may be outbid by outside interests, since the Province "will offer owners of low income farms the market value of farm land and buildings. This value will be determined by an agreed professional appraisal process with appropriate audit. The criteria will be established on approval of the Joint Advisory Board." There is no reason why outsiders could not offer a higher price than the appraisal price. If the government fails to get hold of much of the land it must buy up if reallocation is to be achieved, the agricultural phase of the Development Plan will be in trouble. "Development Plan for Prince Edward Island, p. 36

HARBOUR POLLUTION AND SEWAGE TREATMENT

Since we have been discussing overenrichment and siltation of our streams, it might be advisable to examine the pollution situation in our harbour, and say a word on sewage treatment proposals.

Presently, there are four outflows of sewage in Charlottetown harbour. Most of the pollution is around the wharf, and around the outflows. Informed sources felt that it would be some time before the harbour became a critical zone if you viewed the critical zone as the point at which fish cannot swim there. There are a number of ways in which one can view the critical zone. For example, to a community depending heavily on recreation, the critical zone may be reached if the harbour became unfit for swimming; we have certainly past that stage already. The manner in which the critical zone is viewed will largely determine the steps that are taken to combat the pollution.

If the situation is viewed "chemically" the problem is not too serious. A test called a Dissolved Oxygen Test is used to measure the amount of dissolved oxygen in the water. This is one method of testing the strength of the sewage. Bacteria digest the debris which is deposited in the harbour. These bacteria may be either aerobic (require oxygen for digestion) or anaerobic (do not require oxygen

for digestion). If there is a large amount of sewage in a flow of water, a high degree of oxygen is needed if the aerobic bacteria are to digest the sewage. In other words, there is a high Biochemical Oxygen Demand (The BOD is measured on the basis of the dissolved oxygen tests). If too much waste is dumped into the harbour, the amount of dissolved oxygen can be decreased to practically nil, and digestion by bacteria will occur anaerobically. This kind of digestion results in the strong odour that we experience when we cross the bridge. Obviously, if the dissolved oxygen gets too low because of high sewage content, the fish cannot get enough oxygen to live. The situation, from this point of view, is still not too serious, since fish require five ppm (part of oxygen per millions parts), and presently test results are showing eight to ten ppm in most cases.

"Biologically" speaking, the situation is more serious. One of the tests carried out in this area is an ecologic test. This tests for the concentration of harmful bacteria called pathogens. A high quantity of pathogens can be dangerous. When you have pathogens you always have ecologic, and where you do not have ecologic you never have pathogens. Thus, an ecologic test gives you an idea of the number of pathogens. In some areas the bacteriological count is not favourable. Changes in the current vary the count from day to day, since they change the amount of sewage in an area, and this naturally makes the count rather variable.

Processing plants are major offenders in the area of water pollution. Most of their wastes consist of dairy wastes, blood, fats, and other organic materials, as well as dissolved solids such as chemicals. These have a high BOD count. The wastes from one of these plants can be ten to twenty times as strong as domestic sewage, and the pollution (based on the BOD count) by one of them is equal to the pollution from the domestic sewage of a town with a population of from ten to fifteen thousand people. On the same basis, the frozen food plants pollute on a population equivalent equal to the population of the Island. Not only is the pollution quite serious, but a considerable amount of money is involved in cleaning it up. When dealing with this issue we must, in all fairness to the processing plants, consider the income and employment being created by them, and the other benefits that are realized. However, we cannot ignore the fact that the provincial government failed to demand that they take measures to properly dispose of their wastes.

Now let us say a few words on sewage treatment. Basically, the objective of sewage treatment is to create an environment (by aeration in which aerobic bacteria can gobble up the wastes in the harbour. The overall cost of sewage treatment for the Island will be in the region of five million dollars. One million, two hundred and twenty five thousand dollars will also be spent in the first phase of the plan on industrial waste disposal. The waste treatment plants will be constructed and owned by the province. The industrial plants will have to pay for usage according to the amount of pollution they cause. The costs to industrial plants will likely range from around twenty thousand to forty thousand dollars a year. In the past, the high capital cost of equipment necessary for waste treatment might have been too heavy to allow the plants to compete in their markets. However, the small operating costs that will now be involved should be fairly negligible.

The cost of sewage treatment is under Urban Services and Development for which expenditures are planned at \$5,065,000 during the first phase of the Economic Development Plan. The sewage treatment lines, and the plant will be intended to provide for a Charlottetown population of thirty seven thousand people. Consultant engineers have finished carrying out a study to decide where the sewage lines should run, where the lift stations and treatment plant

CONTINUED ON PAGE S-4

