

# THE RESPECTIVE CLAIMS OF FORESTRY AND AGRICULTURE FOR PLOUGHABLE SCRUB LANDS

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The title of this paper is "The Respective Claims of Forestry and Agriculture for Ploughable Scrub Lands." This title was not chosen by myself, and I find immediately that it presents certain difficulties. In the first place, the terms themselves need definition. As a forester, and I must stress that I can speak only as a forester, I imagine ploughable scrub land to mean land which, by virtue of its easy topography and light vegetative cover and using modern agricultural machinery, is physically capable of being cultivated. Now, under this definition there is much ploughable scrub land which, because of altitude, poor soil, or some other cause such as lack of water supply, is definitely not suited to agriculture. I think that for the purpose of this paper ploughable scrub land was meant to imply "Ploughable scrub land on which agriculture is economically possible"; and it is this meaning that I propose to give it. My second difficulty is that I am asked to compare two forms of land use, which are essentially dynamic, whereas final comparisons can only be made between things which are themselves relatively static. As you will know, and as I will be pointing out later in the paper, the question of forestry versus agriculture for scrub-covered pumice lands was a different one thirty years ago. Developments such as the discovery of cobalt and the perfection of fertilising techniques have entirely changed the economics of pumice land farming, and the relative merits to-day bear little relationship to what they were at the time when most forests in this district were established. This is a most important point. I want to **make** it absolutely clear that the respective claims of forestry and agriculture cannot be considered as final and immutable, but are themselves constantly undergoing change. Consequently all I can do in this paper is to deal with the respective claims as they appear to-day, and as they have been

in the recent past. The third and final difficulty in the title is that a consideration of respective claims, to be at all thorough, should entail the examination in some detail and on a per acre basis of the relative costs of establishment of farms and forests; of the relative monetary yields which could be expected; the relative amounts of labour which would be employed; and, in general, the relative total wealth which would be created. In other words, it should entail a comprehensive analysis of which form of land use is economically the more profitable, and which, by serving the needs, of the community, creates the greater amount of real wealth. These are very difficult and complex questions and time would not permit me to deal with them here. In any case they should be tackled, not by a forester alone, -but by a joint team of foresters, agriculturists, economists, and cost accountants. My remarks to you this morning can thus be only general in nature; and will come as from an amended title, which should read, "Forest policy in relation to ploughable scrub lands on which agriculture is to-day economically possible."

Having thus, as it were, -cleared the ground, it can now be stated categorically that ploughable scrub land should not be afforested and in fact is not afforested if it is physically and economically suitable for agriculture. This principle, that forests do not encroach upon agricultural soils, is an accepted one in forestry teaching, and is drummed into every forestry student. It makes the assumption that forestry is a relatively inefficient form of land use for any soils which can grow crops or pasture. In the older European countries where forestry first developed the pressure of population and hence the need for growing food on all land that could possibly do so was so great that this assumption was never questioned; Under certain circumstances in New Zealand the assumption is very much open to doubt. Nevertheless, foresters in this country have continued to accept it as a guiding principle, and it is the explicit forest policy of the Government. As, far as the State, Forest Service is concerned, the procedure when considering new areas for afforestation is to have them inspected by field officers of the Department of Agriculture and/or the Land Development Branch of the Department of Lands and Survey; if these officers consider that agriculture is reasonably -possible now or in the near future., the land is not taken up for forestry. This is the

general rule, and is adhered to by the Forest Service. It is part of a land use policy which deliberately and correctly gives agriculture first place. The policy incidentally is the more easily implemented in that the two Government Departments most concerned, the State Forest Service, and Lands and Survey, are under joint ministerial control.

Now, although this is the general rule, and is followed wherever possible, there is one important major exception and many minor ones. The major exception refers to districts which are inadequately supplied with timber and other forest products, or will be in the foreseeable future. In such districts it is essential that forests should be created, and in some cases the only land suitable is agricultural land. I might here elaborate on the word suitable. Contrary to popular belief! it is not a fact that land which is unsuited for agriculture is automatically suitable for productive forestry. There are most definite biological and climatic factors which determine where productive forests can successfully be grown and there are equally definite and important practical and administrative factors. Briefly, the following conditions must obtain before any new afforestation scheme can be launched; the altitude and hence the climate must be favourable for tree growth; the soil must be sufficiently fertile for tree growth, and it must also be deep enough to give a free rooting medium; the topography must be such that access, fire protection, and extraction roads can be formed throughout the forest, and if possible around its margin; and finally, the area must be large enough and sufficiently compact to make an economic administrative unit. In most parts of New Zealand large blocks of land which are not wanted by agriculture and which meet all these conditions can be found. In some districts there are no such blocks except on potential agricultural land; when this occurs you have the example of forests, **by necessity**, occupying good farm land. It may be asked why there is this necessity for regional forests, and why instead forest produce cannot be transported from "timber surplus" to "timber famine" districts. The answer lies in the basic facts of New Zealand's geography. Forest produce is always very costly to transport and the costs become prohibitive when the transporting must be done over long distances over high mountain ranges, or, as is so often the case, over both. This then is the major exception, the use

of agricultural land, particularly in geographically isolated districts, to ensure future local supplies of forest products.

The minor exceptions are unimportant from a national land **use** point of view, as the total **area** involved is negligible. They are worth mentioning, however, to explain why some areas of good farming land are to be found even in newly formed exotic forests.

In the first place, each forest must have its nursery, and this must occupy flat, well-drained land, with soil capable of being worked into a good tilth. Then, more often than not, horse paddocks will be required, since horses are often used in the extraction of thinnings. In isolated stations paddocks may also be required for domestic cows. In all stations flat and reasonably good land is required for forest headquarters and forest villages. These exceptions, land for forest villages, for nurseries, and for horse and cow paddocks, are the obvious ones, and they generally result in a small frontage of agricultural land being used. There are less obvious ones. Just as a forest must be an economical unit, so of course must a farm. The case often arises where one farming unit is enclosed within an exotic forest area; as a single isolated unit it is uneconomical, and it therefore should and does go to forestry. Land of this nature is often planted up to more soil-demanding hardwoods, such as poplars. Then, as has already been stressed, an exotic forest area should be reasonably compact. Fire is the greatest single menace to exotic forests, and generally it is from outside the forest that the risk of fire comes. The boundaries must be protected, and therefore they should be as short as possible. The forester cannot tolerate narrow re-entrants jutting into his forest, particularly if they consist of fern- and scrub-covered land. There will, therefore, be cases where small areas of agricultural land are included in the forest area for no other reason than consolidation of boundaries. A further exception, though one that as yet is not of importance in New Zealand, is the need to have some areas of better soil for the growing of special forest crops. A tree, for instance, like ash will only grow well on good agricultural soil, and if it became necessary for New Zealand to grow ash forests in order to provide a particularly high-quality forest product, then it would be entirely justifiable to use agricultural land for this purpose. Finally, there is the consideration that a State exotic

forest should do more than supply the district's needs of sawn ground timber. It should, and often does, experiment with different species to determine which are the most suitable for local shelter-belt and farm wood-lot planting. The forest cannot be used to judge the performance of species unless it contains some land comparable to that on which these species will ultimately be planted; and this of course, again means agricultural land.

So far, I have dealt with the various exceptions to the basic principle that agricultural land should not be taken for new afforestation schemes, or for extensions to existing forests. It may now be asked why this policy has not been followed in the past, since considerable areas of exotic forest can be seen on what is potentially good farming land. The blame for this cannot be laid at the door of forestry. The land was not wanted for agriculture when the forests were established, and it is only recently that the means have been found to make it agriculturally profitable. Three factors seem to have been responsible. Firstly, there have been far-reaching technical developments, such as the discovery of cobalt, the improvement of grass and clover strains, and the greater use of phosphatic fertilisers; secondly, there have been important mechanical developments, the main one being the use of heavy machinery for crushing fern and scrub; and thirdly, there has been the important administrative development, by which the State undertakes and itself bears part of the cost of major land development schemes. These, I understand, are the main reasons why pumice land farming is today profitable, but was not considered so 20 or 30 years ago.

However, whatever the reasons, and I have no doubt you will be told the story in greater detail by other speakers at this conference, the fact remains that some forests do now occupy land which could be profitably farmed. The question then arises whether such land should remain in forest, or should in time revert to agriculture. Time alone will show. As I have already stressed, both forms of land use are dynamic in nature, and it would be a wise man who could prophesy what future trends will be. That there will ultimately be some changes is certain. Immediately, however, there are many compelling reasons why the land should remain in forests, at least for the time being. The most important, perhaps, is the cost of clearing densely planted exotic forest, and the

effect of this cost on the economics of the subsequent farming operation. New Zealand has had little experience of stumping and grassing exotic forest land, but from the one or two cases which are known, and for which costs are available, it is apparent that the operation could not be a financial success. Even, however, if it were economically practicable, there are other important considerations which must be taken into account. Large-scale clearing of exotic forest purely for the purpose of making the land available for agriculture would tend to have the following repercussions :

1. There would often be a need to establish new forests elsewhere. The forest owner could reasonably expect compensation for the extra expenses involved.

2. Immature forests would have to be felled, yielding timber of a comparatively low quality. The forest owner would receive correspondingly low royalties, and again would be entitled to some compensation.

3. Large-scale fellings would create a glut in the timber market, thus debasing royalties further still. In this case it would be a purely artificial debasement, and the forester once more would have a strong case for compensation.

If all these compensation charges were loaded on to the new farm holdings, it would almost certainly be cheaper to leave the land under forest.

-Another consideration is that, as already stated, a forest must be an efficient and economic administrative unit. Capital expenditure on roads, firebreaks, buildings, etc., is considerable, and is incurred only on the assumption that the administrative unit will remain intact for a reasonably long period. A drastic reduction of the effective planted area of any forest would mean that the smaller residual unit would become over-capitalised and hence uneconomic. Further, the forest must be considered as a permanent unit for management as well as for administrative reasons. Forest operations must be planned so that they follow an orderly sequence of planting, tending, and harvesting, with harvesting carried out at an age calculated to give the optimum yield of timber. The unit for such planning can only be the forest as a whole, and not any-constituent part of it. Premature clearing, even of comparatively small portions, will often throw the whole plan out of gear and create needless inefficiencies. The advantages which would be gained by securing a small addition to the national agricultural estate would be more than offset by the disrup-

tion of the foresters' -detailed and necessarily long-term plans. As will be obvious, forestry is a long-term business, and can only be undertaken when the tenure of the land is secure. Land once under exotic forest should remain so, at least for one rotation and preferably for more.

Finally, of course, the clearing of mature exotic forests and their replacement by grass would entail a destruction of real wealth, and it would be many years and possibly many generations before the loss could be recouped. As an example I might quote Whakarewarewa State Forest, a small plantation near Rotorua, which does in part occupy potential agricultural land. This forest employs 150 men the year round and supports a very thriving forest industry which itself employs even more men still. It provides for domestic consumption a variety of much-needed commodities, such as sawn timber, box shooks, telephone poles, railway sleepers, and fencing material ; and it exports considerable quantities of sawn timber overseas. It is thus a primary producer of some importance. It would be false economy and not in the national interest to suggest that any land within its boundaries should at this stage revert to agriculture.

To summarise, then, the conclusions of this paper are :-

1. That newly established- forests should not encroach on "ploughable scrublands," although there are certain inevitable exceptions to this principle.
2. That previously established forests do often occupy land which to-day is considered suitable for agriculture, but which was not so considered at the time the forests were planted; and
3. That there would appear at present to be insuperable difficulties in any large-scale programme of clearing existing forests and converting them to grasslands.

In conclusion I would like to stress again, that the final pattern of forests and farms has not yet been worked out. Undoubtedly, there will be further changes, and in more than one direction. Some forest land must ultimately go to farms, and some farming land may yet revert to forestry. In working towards what should be the- ideal 'land-use pattern, I hope that the farmer will always realise these basic facts; that forests provide commodities which are as vital to him as they are to the rest of the community; that to provide, them economically the forests must be of the

right size and in the right place; that forestry is not possible unless the tenure of the land is reasonably secure; and finally that the forester, like the farmer, is a primary producer who, to an increasing degree, is sharing with him the distinction of earning the nation's overseas credits.