

Enhancing Ecological Sustainability of New Zealand's Agricultural System - Role of the Native Plants

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***Abstract :** Developing a sustainable future for agricultural systems in New Zealand requires an appreciation of our very recent forest origins, the consequent fragility of the land and biodiversity, and the increasing environmental management demands being placed on all land users by New Zealand society and our fussy global consumers. The long-term land use trends are to more intensive uses, agricultural and peri-urban, and towards systems embracing more trees, woody species for production and biodiversity purposes. This is being driven by both ecological and economic imperatives. New Zealand's land and climate are forest friendly. Ecologically, that is where the vegetation of much of our land will head unless diverted by man's efforts. To date the development of our agricultural systems has followed the post WWII model of simplification with higher inputs of nutrients and energy. NZ systems in productive terms have relied almost exclusively on introduced species. Our indigenous species mostly reside in protected areas. This paper explores the ecological and economic (market) implications of lack of integration of our native flora into the "engine room" of our agricultural systems*

Introduction

New Zealand is a very recently settled land. However, we have developed very successful farming systems, primarily based on pastoral systems. Hence it is appropriate to develop the theme of this paper on the basis of our economy, our neglected native plants within a sustainability context and raise some questions that New Zealand is interested in.

However, I would like to present some facts on the Parliamentary Commission for the environment at the beginning of this presentation. The Commission is an independent body, which was the first established in the world to account for environmental matters. Hence the work of the Commission is very broad and it is stated that the commission may not have strong or sharp teeth, but has very strong gums to disclose what is happening to the environment of New Zealand. Hence we look at farming, energy, the sea and the management of genetic material that we are confronting today.

New Zealand Farming Systems

New Zealand farming systems are principally pastoral based. Hence we as a small nation with 3.5 million people situated a long way from many that need food. Therefore, New Zealand will never meet the needs of the most hungry in the world. However, from a very biotic point of view, that is closely linked to a unique ecology, we do supply a large quantum of food to the world - We do this through the output of quality food through integrated systems, while maintaining environmental standards. Hence we have developed in the recent past a land that has been 80 million years in the making. It is the most recent piece of land on this planet and the Polynesians and

later the Europeans who settled in it have developed the farming systems to a standard at a very fast rate, a rate not seen anywhere else in the world.

**Natives in
New Zealand's
Farming Systems**

New Zealand has a very open economy and hence we have a significant flow of goods, because we are an exporting nation. However this creates an enormous challenge in the area of biosecurity, as we do not have many things that other countries have, but could have a significant impact on agriculture and the indigenous plant and animals that are found in our country. Farming enterprises of New Zealand are highly dependent on the resilience of their systems, especially ecological resilience. Thus, they have to overcome shifts in the biological and physical environments. However, they must be closely linked to the unique biological heritage. It is here that the native fauna and flora become important.

Today, 30% of New Zealand's land area is protected. It is here that the emphasis has been in preserving our native fauna and flora. However, we need to position this wealth in the context of our ecological resilience and also in the context of our food systems. The integration of native flora into agriculture is very difficult in New Zealand and it is a challenge to sustain productivity, while including the native species. Agricultural development that has taken place through extensive deforestation has led to the loss of birds and plants. Hence today, they are maintained within private protected lands. However we do need to integrate these into our systems. The question is - How do we do it? This is being debated at present both from a technical and philosophical point of view.

The Commission for the Environment is today undertaking surveys to seek the possibility of incorporating native New Zealand flora into our agricultural systems. This is being done within the context of our diverse ecosystems, production systems and in the current face of global warming and climate change. We are looking at nature farming systems, as they are potential areas of rich biological diversity and hence could easily accept native New Zealand flora. However, we do not have many studies and the Commission has to grapple with. We also have to remember that with greater inclusion of new species, a few species die off. Furthermore, we do not have much funds for this work. However it is important to note that we have initiated this program and do have the support of institutions such as the Lincoln University, where organic or nature-farming units have been developed in the recent past. These units have used indigenous species to build up insect populations to work within crops. Studies are underway to integrate the wide range of fungi present in New Zealand to farming systems. The next question is - should these species be active or passive components in farming systems? New Zealand has some very elegant legislature that have made it possible to partition lands into sections having protected or productive vegetation. Hence there is a tendency to believe that the governments would look after the protection of native species and blending them into farming systems. However, New Zealand must go beyond this concept - and seek the possibilities of harmonizing native and productive species on a more national scale.

There is also a contention in New Zealand - Who owns the native species? The treaty of Waitangi signed in 1840 states that that such aspects need to be sorted through tribunals and this has been addressed at present. There is also a question of the economics of native species. For example, there is valuable timber for furniture in New Zealand. However, this is protected and we now import wooden furniture. We are redeveloping

the native flax industry, as there is economic potential and evaluating the possibility of obtaining fur from possums

There is considerable scope for including native species in organic systems. This is due to the biological diversity present in such systems. Programs undertaken in the North island, especially in Auckland highlights this clearly. However, the whole concept requires dialogue - where do the native plants fit into the agriculture of New Zealand? There is significant potential, but New Zealand has just started this work. The experience we have is poor and hence there is much work to be done and to draw upon the experiences of other nations.

We have created food systems destroying native species. Today the native species are a valuable asset we have and their inclusion is fundamental to the survival of our ecosystems and for ecological resiliency of our food systems. This is the challenge we in New Zealand have - They are needed and we must include them in our food systems to preserve the nature of our country.