

SUBMISSION TO THE AGRICULTURAL COMPETITIVENESS
WHITE PAPER

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Preamble

This submission to the Agricultural Competitiveness White Paper addresses those issues in which the author has experience and training. It also addresses some issues which, though mentioned in the issues paper do not receive the prominence they deserve in the Questions for consideration.

These issues are:

The degraded state of much of Australia's farm land.

The lack of education among Australian farming practitioners.

Any attempt to improve the competitiveness of Australian agriculture must address these two issues as a priority if there is to be any success in the exercise.

There are various estimates of the amount of Australia's farmland which is degraded. These generally suggest that about eighty percent of Australia's farmland is degraded to the extent that its productive capacity is impaired. Personal observation tends to confirm that estimate. It is therefore, apparent that there is scope for a huge increase in the productivity of Australia's established farm land if appropriate measures are adopted for that degraded farmland's restoration. The author has recent successful experience in doing just that.

In 2003 the author purchased Carlton, a seriously degraded farm near Texas on the Queensland/New South Wales border, with the stated intention of restoring a degraded farm to productivity without spending a lot of money. The farm is 228 hectares in extent and has a history of growing good crops of wheat and barley, as well as beef cattle and wool. At the time of purchase the farm was so degraded that it was incapable of any agricultural production whatsoever. By the time the author and his wife retired from the farm in 2013, it provided more than sufficient feed for forty cows and their calves, without need for feed supplements or chemicals for the control of internal or external parasites. The author estimates that, if the farm continues to be managed in a sustainable manner, it will, in another five years, be capable of sustaining, on a permanent basis, eighty cows and their progeny, at very low production cost.

There are those who comment that Carlton constitutes a very small area of land so the result of the author's efforts would not be reflected in a holding of greater area. The author's response is that two elderly people put their life-savings into a degraded farm which was of a size they could manage without employing any labour, and succeeded in, not only rejuvenating the degraded land to increase its productivity, but also reduced the intensity of drought and the incidence and intensity of flood. This was achieved in ten years, eight of which were in drought, Anecdotal evidence suggests that the previous fifteen years were also droughted.

This is an achievement which the broader Australian agriculture would do well to emulate.

Many people have asked how we turned a wasteland into a productive farm. It was the end product of a broad but comprehensive education in sustainable land use, combined with a lifetime of experience of farming on four continents.

It was a matter of choosing the right breed of cattle to suit the farm as it then was and which would prosper in improving conditions. It was a recognition of the role of soil micro-organisms for the nutrition and proper development of pasture and livestock, and an ability to foster the conditions in which those micro-organisms would prosper. It was recognition of the importance

of organic matter in the soil to facilitate moisture absorption. It was recognition of the necessity to keep the soil surface covered in a deep blanket of organic matter at all times in

order to reduce soil erosion, to reduce water run-off, to reduce evaporation, to resist soil erosion by wind, to keep the soil cool, to provide a suitable habitat for small creatures, to provide a base for the further growth of pasture. All this was done by controlling the grazing so that livestock always had enough to eat, and the land was not denuded.

A vital part of this process was the provision of a supply of clean drinking water to all parts of the farm. This was done by means of a pipeline from a bore to a tank on the highest part of the farm, and troughs strategically placed, from which the livestock could drink. This was only made possible by the ability to locate underground water. If the author had not found very good indications of underground water, he would not have bought Carlton, because without abundant water a farm is unsustainable. A knowledge of hydraulics and engineering allowed the adaptation of equipment for the installation of the system of reticulation. The clean water supply was the major driver of excellence in animal health.

It can be seen that the matters of the degraded state of much of Australia's farmland, and the need for education in the theory and practice of sustainable agriculture have been addressed above. There is no prescription for the restoration of degraded farm land because each instance is unique. Only educated and experienced farmers will be able to be successful in such restoration.

There are pressures to open areas of northern Australia to agricultural development. The questions which need to be answered are:

- Is it better to open new areas to agriculture or to enhance the productivity of existing farmland?
- * If new areas are opened to farming, is there any assurance that the mistakes of the past will not be repeated?

These, and other matters will be addressed below in response to the Questions for Consideration in the Issues Paper.

ISSUE 1. ENSURING FOOD SECURITY IN AUSTRALIA AND GLOBALLY

There are small towns and larger regional centres scattered across Australia. These are linked by roads, and in some cases, railways and airports. These provide the basic infrastructure needed to support a productive agriculture. But, in so many rural areas, agriculture is struggling, for a variety of reasons. Among these are:

- Climatic variability
- Uncertainty in marketing
- Lack of timely, relevant and accurate information
- Unsustainable land use practices
- Lack of, or inappropriate, agricultural education and training
- Closure or restriction of rail services

All these issues can be addressed.

If sustainable land use practices are widely used, farming will be better able to withstand the variability of climate. This will be achieved if systems are restored to provide timely, relevant and accurate information to farmers as well as to provide a broad agricultural education to young, aspiring farmers.

Uncertainty in marketing of agricultural produce is a major problem with a variety of causes. There have been numerous marketing boards and co-operatives, set up to market agricultural products. Some of these have been very successful. Others have not, because their directors have been elected from among producers. Often these directors have no training in marketing and a very limited general education, which inhibits their ability to make sound marketing decisions. A classic example of that occurred when the author did not receive his final payment for rice until eight years after selling the rice farm.

A further impediment to marketing is the trend to foreign ownership of marketing and down-line processing of agricultural products.

Foreign companies do not always work to an agenda which includes the competitiveness of Australian agriculture. The way is open for foreign companies to actively suppress Australian agricultural production in order to assist production of similar products in other countries where their profits may be greater.

One of the greatest hindrances to Australian agriculture is the perception in the farming sector as well as in the wider community, that Australia is a “land of droughts and flooding rains”. This has long been a cherished part of Australian lore, promoted in song and poetry and in tales of floods and drought which are passed down from generation to generation. It has imbued Australia with a sense of despair and acceptance of disaster about which nothing can be done. But one has to ask how this came about and whether it is realistic.

When the first Europeans came to Australia, they thought they had come to a natural environment. Indeed, cartographers labelled it *terra nullius*, nobody’s land. That, of course, was a terrible mistake. Australia had been inhabited for thousands of years by people who were ‘hunter gatherers’. They were nomadic, having no fixed abode, but wandering great distances, finding edible plants, and hunting animals. A primary tool in primitive hunting is fire. Fire can be used to remove vegetative cover so that animals are easier to see and kill. Fire is used to drive animals in a particular direction or to surround them so that they are easier to kill. Fire can be used to remove old, dry grass, so that the new, green grass is easier to see, and animals are attracted to it. So fire was very important in the lives of indigenous people. But fire is hard to come by in a primitive society, so it had to be cherished and in the walkabout it had to be carried as burning embers. The problem with burning embers is that they tend to drop little bits of burning material which can start new fires. Thus, huge areas of Australia were burned on a regular basis for thousands of years by deliberate fire lighting by the people, and the accidental lighting as people moved about. This repetitive burning removed the vegetative cover from the soil, exposing it to erosion by water and wind, depleting its plant nutrients and its water-holding capacity and causing un-natural deposition of silts in the valleys. Thus Australia became a

land of droughts and flooding rains, which is not a natural state for Australia, but it caused the European population to believe it was.

The vagaries of climate in Australia are not very different from those pertaining in many other countries and continents which support a much larger population than Australia's. The problem arose because the first Europeans in Australia had no experience in agriculture other than in Europe, so they were unable to understand the new environment in which they found themselves. The same thing happened in North America where the settler farmers used European farming techniques which led to disasters such as the 'dust bowl' in the mid-West. It took people like Louis Bromfield of Malabar Farm in Ohio to demonstrate that if you took the trouble to learn how to understand the environment, you could have a successful and sustainable agriculture.

In a similar vein; when the author and his wife embarked on a tree planting venture at Carlton in order to provide shade and shelter and to bring about an increase in biodiversity, they planted over three thousand eucalypts in variety trials, to discover which trees proved most suitable for the environment. Most of these trees were planted in an area close to the main road, so they were observed by passers by. Neighbours, and also staff of Landcare and the local catchment management authority commented that it would not be possible to grow trees successfully without irrigation. Our very successful tree planting demolished that idea.

One can only conclude that there is enormous scope for increasing Australia's agricultural competitiveness by improving the standard of Australian farming practice in those areas which already enjoy the benefits of existing infrastructure. Of course, there are many farmers in Australia whose methods are efficient and sustainable. There is a role for government in making their knowledge and skill known to the wider farming community in order to achieve a greater productivity.

There may well be strategic reasons for bringing about an increase in the population in northern Australia. Those are not within the scope of this paper. Suffice it to say that it is essential that any large-scale enlargement of agriculture in the north needs to be done in a manner which is sustainable in the long term, produces products for which there is a real market and provides opportunities for people to be engaged in satisfying agricultural production which enables the establishment of well-ordered, family-oriented communities. There is a need to be wary of very large corporate agriculture ventures, which invariably become financial failures and are sold to foreign interests. That is likely to defeat the original strategic reasons for starting the venture in the first place.

Whichever way we intend to increase agricultural production, there is a great need for a system for the dissemination of knowledge, the results of research and the experience of successful farmers. This used to be the province of State Departments of Agriculture which had very effective Extension Services. That has now gone and has been replaced by agronomists and animal health experts from the private sector. Many of these experts are employed by companies which sell products to farmers. This opens the way for the advice proffered being tainted by the need for sales. Thus a farmer can be persuaded to buy products which are not really needed. The former professional extension officer was not expected, or paid, to sell anything, so the advice provided tended to be more reliable.

In summary; there are huge opportunities for increasing agricultural production in Australia. The most economically efficient opportunities lie in the existing farms which are served by roads, sale-yards, rural towns, schools, hospitals, shops and rural supply stores. Most of those farms can increase the efficiency of their agricultural output by the simple means of adopting sustainable land-use methods.

Farming enterprises which are remote from normal infrastructure and services can also increase their productivity by adopting sustainable land use practices and may, in time, attract those services which, in less remote areas, are considered essential. Because most of those remote enterprises are large, there could be merit in dividing them into more manageable sizes in order to promote

sustainable land use and economic efficiency and to settle more people on the land. Apart from strategic objectives, there is very little merit in opening new land in northern Australia for farming before best use is being made of existing farms

However agricultural output is increased, the prerequisites are:

Firstly, the provision of affordable, comprehensive education in sustainable land use, to potential farmers, educators and land-users in general.

Secondly, the provision of affordable, comprehensive training in rural skills to people who wish to become employed in agriculture.

Thirdly, the appointment of qualified and experienced extension officers who become immersed in the communities they serve so that they are able to assist farmers to understand new practices or processes and to overcome problems. They can also supervise the use of land to ensure its sustainability and serve as a conduit for information between farmers, researchers and government.

ISSUE 2:

FARMER DECISIONS FOR IMPROVING FARM-GATE RETURNS

There can be no doubt that the income derived from farming is of great importance to the farming family. However, of equal importance, but often overlooked, is the necessity to manage the farm enterprise in a sustainable manner so that nothing will detract from the ability of the farm to continue to be productive in perpetuity. In other words, nothing should be done to infringe the farm's sustainability. Thus, any farming practice which tends to allow increased rates of soil erosion or water run-off, or reduces soil microbe activity or results in increased disease in livestock or crops or pollutes water supplies or reduces farm income to be less than farm outgo, can be seen to be unsustainable.

While contemplating rates of return for various farm enterprises, one needs to bear in mind that many farms have the capacity to have very high rates of return for a short period, at the expense of longevity. It is possible for a farm to look economically sound for a few years because it is 'mining' its inherent fertility. But that won't last. What is important is that the farm should deliver a reasonable rate of return on capital and labour continuously. Unfortunately there is often an emphasis placed on farm gate returns at any cost. The well conducted sustainable farm will deliver sound returns, year after year, without any harm to itself. If this is done there will be a lesser risk of being affected by drought or flood or fire.

This is the basis of sustainable land use.

The main driver of sustainable land use is the effective retention and use of rainfall, which can be achieved by the maintenance of a thick blanket of vegetation on the soil surface so that rainfall is absorbed and is not, later, evaporated. The absorption of rainfall will reduce flooding. It will make water available to lengthen the growing season of crops or pasture. It will reduce the effects of less than optimal rainfall. It will also promote a lively in-soil biodiversity which will provide a more productive environment for growth of healthy plants which can feed healthy animals and people.

Another pillar of sustainable land use lies in preparedness for fire. Fire, not only destroys crops and pastures and buildings, it can be fatal to farm and other animals and to people. A consequence of fire which is not widely appreciated is the disastrous effect it can have on soil structure, absorption capacity, and soil micro-organisms. It can take ten years for a pasture to fully recover from a hot fire. It is therefore essential, on a sustainable farm, to make adequate preparation to extinguish fires before they do too much damage. This can be a costly exercise that is often neglected by farmers.

In order to be prepared to extinguish fires it is necessary to make effective fire breaks which will limit the area in which a fire can burn. Effective fire breaks will also provide a safe area from which to back-burn toward an approaching fire. There is no prescription for the making of effective fire breaks, it depends on the terrain, vegetation, direction of prevailing wind, placement of fences, roads and water courses and the equipment available. A competent farmer will be able to make effective fire breaks on his or her farm.

In order to improve the chances of being able to extinguish fires before they become widespread it is essential that there is available, for immediate use, a fire fighting appliance, which may be a trailer or a truck, mounted with a tank for water, sufficient hose with a nozzle suitable for fire-fighting. Such equipment must be maintained in good order at all times and all the people involved must be trained in how to use it. Fire breaks should be made so that they can be used as roads for the fire-fighting appliance to travel on. It is

essential that this equipment is available because the local fire brigade will take some time to arrive at a fire scene’

The whole point of this discussion of sustainable land use, the amelioration of the effects of flood and dryness and the prevention of the spread of fire, is that all these activities can be described as costs, which reduce the farm gate returns. They probably do in the short term, but in the long term they are essential. When comparing farm gate returns of various enterprises it is wise to bear in mind the costly and necessary activities which do not directly contribute to farm gate returns.

Experience at Carlton demonstrated that the many costs associated with soil and water conservation detracted seriously from farm gate returns in the year they were incurred. However, in later years those activities contributed to farm gate returns in the form of greater carrying capacity of the pasture. Similarly, many progressive farmers engage in research and experimental activities which are a negative influence on farm gate returns in the short term, but can be great drivers of productivity in the long term. The withdrawal of government extension activity has increased the necessity of farm-based research, to drive the industry forward. For instance, at Carlton we undertook varietal trial for trees because there is no longer a Forestry Department presence which could provide advice, within five hundred kilometres.

At the end of ten years at Carlton there was a tremendous increase in income and a lessening of cost so that farm gate returns were much improved.

The practice of using farm gate returns to measure and compare the effectiveness of farming enterprises is fraught with danger. A progressive farmer may spend a high proportion of net profit on research, which will detract from the recorded returns in the short term. A less progressive farmer

may spend little on anything beyond essential production costs, so will show greater farm gate returns.

A discussion on farm gate returns tends to concentrate on the short term, whereas the long-term viability of the farm demands a broader view. Much of the work which is essential in a bid to ensure the long-term sustainability of the farming enterprise, particularly if the farm has suffered extensive degradation, may be beyond the financial capability of the farming enterprise at the time the work needs to be done. That is a situation in which outside funds, at reasonable rates, will be needed in order to complete the work in a timely manner. It is essential that the work to be done will be successful in achieving the objective of sustainable land use. For this reason, the lender must be satisfied that the land-user has the knowledge and the skill to satisfactorily complete the work. In many instances, the lender will need to approve the plan of the work, supervise the implementation and approve the finished work. There may need to be on-going supervision to ensure the continuing integrity of the work. The implication of that is that there must be a corps of suitably qualified and experienced people to oversee, plan and supervise such projects. That would be the role of qualified and experienced Conservation and Extension Officers of the State Department of Agriculture.

The questions as to the “drivers and constraints to farmers adopting alternative business structures, innovations or practices” and the “tools, skills and advice farmers need to effectively adapt and respond to the risks they face”, raise the matter of farmer education generally.

Most farmers, by the very nature of the work they do and the isolation in which many of them live, tend to be very conservative. There is a reluctance to explore practices and skills which are outside the farmer’s experience. So often the attitude is:

“This is what Granddad did and so did Dad. It worked for them so I will do the same”.

The fact that the practices adopted by previous generations may have been harmful to the long-term sustainability of the farming enterprise is probably never considered.

In order to overcome this kind of constraint to more appropriate decision making, there does need to be a system for the education of, particularly, young or aspiring farmers. Such a system must be affordable, appropriate, and acceptable. It may take the form of a kind of apprenticeship.

It will be beneficial to the understanding of this proposal, to examine the situation regarding migrant workers in Australian agriculture in the 1950s/1960s. This was a time when many migrants from Europe arrived in Australia. Most of these people had very little command of the English language, they were weary with the life of conflict in their childhood and were keen to make a new life in Australia and were prepared to work very hard to do so.

Many of these people found seasonal work, picking fruit in Victoria, moving to coastal Queensland to cut sugar cane and then moving to the Mareeba area to harvest and grade tobacco. It is interesting that there were very few English migrants among these seasonal workers. Perhaps that was because their proficiency in language opened opportunities for more settled occupations.

The seasonal workers found nearly continuous work by following the harvest from south to north and back again. In this way, many of them accumulated cash reserves because the work was quite well paid. More importantly, they acquired a very broad experience in varied agricultural pursuits and some proficiency in the English language.

After a few years of the seasonal harvesting round, many of these people had sufficient capital to engage as share-farmers, particularly in the tobacco industry.

Here they learned, often under the tutelage of the farm owner, the basics of farm management, budgeting, labour management, banking and all the skills a successful farmer needs. As share-farmers they had risks but also the

opportunity to make good profits from their enterprise. Many share-farmers had forged good relations with the banks, which were keen to help them to buy their own farms, which they did, with great success. Thus, in a period of about ten years, these migrant workers became established farmers, raising families and contributing to the varied life of vibrant communities.

An interesting aspect of this is that when the tobacco industry closed down in the 1990s, most of these farmers used their broad experience, gained when they were seasonal workers, to help to adapt to changing circumstances and engage in new ventures. Hence many of them, or their children, are now growing mangoes, avocados, bananas, sugar, vegetables, coffee, tea, maize, peanuts or cattle, still in the very stable and vibrant communities they had founded.

The experience of migrant workers in the twentieth century provides a model for the education and training of farmers in the twenty-first.

But, firstly there is a need to bring agricultural education, and particularly education about the sustainable use of land, to all children at an early age, continuing until at least year ten in high school. At that stage, children start to specialise in preparation for their chosen career, which may not be in agriculture, so they will need to commit their energies to the study of other subjects. After all, if a person is going to be a mechanical engineer or a doctor, there will be a need to concentrate on those subjects which will further their career, but an early appreciation of the basis of agriculture will not go amiss.

School leavers, who do not wish to go to university, could well profit from an agricultural apprenticeship scheme which is outlined below.

Initially the apprentice would be engaged by an approved agricultural enterprise, for a period of one or two years, depending on the age and maturity of the apprentice. It would be beneficial if the apprentice could live with the farm owner's or manager's family as this would increase opportunities for discussion and therefore the apprentice's understanding of farming activities. The pay and conditions for the apprentice would need to be decided on. After one, or in the case of a younger apprentice, two years,

the apprentice should be given the opportunity to attend, on a full-time basis, an agricultural college which will provide, in a two-year course, a comprehensive education in sustainable agriculture. This course will cover the theory and practice of a wide range of agricultural activities so that the student will be able to manage many agricultural situations, or, in the event that the former student does not know the solution to problems, will, at least have sufficient knowledge to enable him or her to ask the right questions. It is preferable that the college is residential so that students have ample opportunity, after hours, for informal discussion of the subjects they have been studying.

Attendance at such an agricultural college must be affordable. This may require some kind of scholarship for some students.

The college would award a diploma to students who successfully complete the course. This diploma will be recognised internationally. There may be scope for the enrolment of international students in these colleges.

The author is prepared to assist in the development of curriculum for agricultural colleges.

After successful completion of the agricultural college course, successful apprentices/students would be encouraged to seek meaningful employment in varied locations in the agricultural sector for the next four years in order to broaden experience and accumulate some funds. Some of this experience should be overseas.

At the successful completion of the four year term, the person would be eligible for a loan, provided by government, to enable the person to purchase a farm. This might be the family farm, purchased from parents, or it may be any farm anywhere in Australia. It might be a new farm in an area being opened for agriculture. Normal banking conditions would apply, but the rate of interest must be modest.

Such a scheme, as outlined above, would introduce to the agriculture sector a stream of highly skilled and educated people to be examples to the industry, to be successful and, in many cases lead agriculture into a prosperous future.

There will be some apprentices who, for many reasons, do not go to agricultural college but who wish to continue employment in the agricultural industry. These people should be encouraged to attend courses in rural institutes which provide instruction on basic agricultural theory as well as in the skills required by agricultural workers. These institutes could be positioned within rural areas in which the students wish to gain employment so that instruction is provided on skills relevant to the agriculture of the district.

It is envisaged that such rural institutes will provide a course of one years duration covering basic agricultural theory as well as providing training in the skills required by workers in the agricultural industry. It is desirable that rural institutes provide accommodation for students. Attendance at rural institutes must be affordable.

On successful completion of the course, students should be awarded a certificate of competency which would be recognised internationally. There needs to be a pathway so that students who are awarded a certificate from a rural institute would be able to transition to an agricultural college with recognition of prior learning.

By the means outlined above there will be a flow of appropriately trained and experienced people who will gain meaningful employment in agriculture.

Again, the author is prepared to assist in the development of curriculum for agricultural institutes.

The program outlined above emulates, in some degree, the experience of European migrant workers in the 1950s, in that it provides a pool of experienced people who will benefit agriculture. The difference is that the new generation of young farmers will be well educated in the science and practice of sustainable agriculture.

DROUGHT

*If you can meet with Triumph and Disaster
And treat those two impostors just the same*

-----*you'll be a man my son.* Kipling.

Flood and drought are, like triumph and disaster, impostors, which afflict not only agriculture, but also the towns and major cities, bringing variously, excessive water and associated mud, and the heartbreak of declining water supply. These impostors are described as natural disasters, and there is a general feeling that they are unstoppable. That is a tragedy because flood and drought are closely related and each contributes to the other.

In a natural landscape, there is a covering of vegetative material on the soil. In areas of high rainfall this covering is thick and dense because rainfall frequency and intensity are high. In areas of lower rainfall the vegetative covering is more sparse because rain doesn't happen very often, and when it does, it is not usually in large amounts, so there is less danger of the soil being disturbed by water run-off. In all areas in a natural environment there is adequate soil cover for the normal circumstances. If the natural cover of the soil is disturbed or removed there will be a decrease in the amount of

water which is absorbed into the soil and a corresponding increase in the amount of water which rushes down hill in a flood. The reduced absorption of water into the soil reduces plant growth so that there is less food for livestock. That is drought.

Even in a natural landscape there will be variations in the frequency and intensity of rainfall events, but the natural environment has buffers which level out the extremes. If the natural buffers are removed, trouble will ensue.

The author gained experience of this quite early in life. In the small village of Bagendon, where he lived in rural England, there was a church which was built in the fourteenth century, in a safe place beside the stream. It is still there. In those days, most of the land was Common, undisturbed from its natural state, and used for communal grazing.

Starting in the sixteenth century, there was a significant increase in the price of wool, so there were moves to 'Enclose' large tracts of land which became the property of a few wealthy people who monopolised the wool industry. There was a tendency to keep large numbers of sheep on the enclosed land because the scarcity of grazing led to the production of fine wools which attracted premium prices.

Sounds familiar?

In the middle of the seventeenth century, the demand for wool declined, so the pastures were ploughed for the production of crops.

The effect, firstly of over grazing and later cropping on the steep sides of the valley, was to allow the erosion of huge amounts of soil which was deposited in the valley floor. This resulted in the stream flowing on a raised bed between banks which were higher than the surrounding land. In times of unusually high rainfall the water overflows these banks and floods the surrounding land, including the church, which had originally been built in a safe place. About every ten years the church is flooded to a depth of about a metre-and-a-half.

This is much like what happened in Australia except that the re-shaping of the Australian landscape took place over many thousands of years of burning

which removed the land's protective shield. That is why so much of the high ground in Australia is deficient in organic matter and available plant nutrients, and much of the low ground is subject to flooding.

It is possible to limit the continuation of that process by the simple expedient of maintaining a cover of vegetative material on the soil to enable the greater absorption of water and a reduction of run-off. This will increase the growth of plants and therefore the number of animals which can be supported on a given area, and it will reduce the incidence and intensity of flooding. The increased moisture in the soil will encourage the diversity of soil biota which will further encourage the growth of pasture. To put it very simply;

Land, covered in grass, will feed animals.

Bare land won't feed anything.

In order to keep a blanket of grass on the soil it is necessary to control the grazing. This implies the construction of fences and the provision of drinking water in the fenced areas. Such infrastructure is expensive and may be beyond the financial capacity of many farms, but it can be done, by the provision of concessional loans. The result will be more productive and sustainable farming, and a reduction of down-stream flooding.

It must be added, that concessional loans for any purpose in agriculture must only be granted to people who can demonstrate that they have the knowledge and the skill and the willingness to carry out the intended work in a timely and proper manner. There is a need for supervision.

The continuous management of grazing involves controlling the numbers of livestock and the length of time they graze on any area. In times of less than optimal rainfall there is likely to arise a situation in which there are too many livestock so that it becomes necessary to move some stock off the farm in order to protect the pasture from the ravages of over-grazing. Agistment may be a solution in this situation, if it can be found at a realistic cost. However, agistment brings perils because there is no control over such matters as the cleanliness of the water supply, the state of the pasture and the fences, and the control of breeding and disease.

It may be desirable to sell some of the livestock in times of declining feed. This usually means that there is a glut of cattle on the market, so that prices are depressed even though prices for meat are unchanged. This situation means that processors profits escalate at the expense of cattle producers.

Sometimes the removal of cattle in time of drought may mean that good breeders will go to slaughter, so they are lost to the industry. When climatic conditions improve, there will be a scarcity of breeders to re-build herds. We need to have a system which encourages and enables those who have available feed to purchase breeding cattle at fair prices and on equitable terms.

All of the above, points to the need to have a nation-wide scheme for the promotion of sustainable land use. Such a scheme must embrace all uses of land, not only in agriculture, but in urban, mining, transport infrastructure, town water supply, forestry, national parks and recreation. Whatever is done on any portion of land will have impact on other land, so there is a need to ensure that all land use is compatible with other land.

PROPOSAL FOR A SCHEME TO ENSURE THE SUSTAINABLE USE OF ALL LAND IN AUSTRALIA

Because agriculture occupies and uses the majority of Australian land, it is appropriate that a scheme to ensure the sustainable use of all land be the responsibility of the Commonwealth Minister for Agriculture.

It is suggested that Australia uses, as a model for its scheme for the sustainable use of all land and the enhancement of agricultural production, the scheme initiated by the Government of Southern Rhodesia after the Second World War. There was a very large area of fertile lowland in a remote part which had no human inhabitants because of the presence of tsetse flies which are the vector for serious diseases which are fatal to humans. The means were found to eliminate the tsetse flies, so that human habitation became possible. The fertile soil provided good opportunities for agriculture and there were sites, in the Sabi catchment for storage dams which were necessary because the area had very low rainfall.

A study showed that the development scheme was feasible provided there was a concerted effort to reduce soil erosion and excessive water run-off in the higher areas of the catchment, otherwise any new water storage dams would soon become filled with sand. So the Department of Conservation and Extension was founded within the Ministry of Agriculture.

Qualified agronomists, soil scientists, animal production specialists and other scientists were recruited and underwent training in soil and water conservation.

They were then appointed to designated Intensive Conservation Areas where they worked, with a local committee, appointed by government, to promote excellence in agriculture with an emphasis on the sustainable use of land. This was done, not only in the Sabi catchment, but over the whole country.

This scheme invigorated agriculture by providing timely and relevant advice to farmers, by improving farming practice, by ensuring best use of land and water and by providing a conduit between farmers and researchers and between farmers and government. The conservation of soil and water and wildlife became entrenched in Rhodesian farming practice. The resilience of the Rhodesian system for the sustainable use of all land was demonstrated in 1965 when Rhodesia made its Unilateral Declaration of Independence, and trade sanctions were imposed by Britain and a number of other countries. Until that time, the total annual production of wheat in Rhodesia was sufficient to feed the people of the city of Salisbury for three days. Within two years, Rhodesia was self-sufficient in wheat. Similarly, Rhodesia became an exporter of sugar and maize. It used surplus sugar to produce ethanol in order to reduce reliance on imported fuels. It profitably beat sanctions by flying beef to destinations in Europe. Rhodesia gained a reputation as a reliable supplier of quality tobacco.

Rhodesia was the only country in Africa to be a contributor to the Freedom from Hunger Campaign.

Agriculture prospered, despite a prolonged terrorist war in rural areas.

Australian agriculture could be similarly invigorated by the establishment of a scheme to promote the sustainable use of all land, by the re-instatement of world-class agricultural extension services, by the establishment of demonstration farms, by the education of the whole population on sustainable land use, by the education of prospective farmers and the training of prospective farm workers.

The success of any scheme for the enhancement and conservation of Australia's natural resources and the sustainable expansion of agricultural production will largely depend on a general understanding, by all people and organisations, of the concept of the National Estate which recognises that all land and water is the responsibility of the whole nation, even though portions of it may be held under freehold title. The community, in other words Government, has an over-riding responsibility to ensure that the resources of land and water are carefully

husbanded so they will continue to function for the benefit of current and future generations. There is a need to ensure that land and water are used in a manner which reduces the frequency and severity of flooding and reduces the impact of dryness. This will only be achieved if governments, Federal, State and Local are involved together with all the people in a nation-wide scheme of natural resource enhancement.

Such a scheme will embrace:

- Education, in schools, colleges, universities, and in all walks of life on the responsibility of all people to ensure that their activities are compatible with sustainable land use.
- Training of those who use natural resources in their everyday activities, to ensure that their use of natural resources is sustainable.
- * Technical assistance for those whose every-day activities are concerned with the use of land
- * Funding for those activities
- * The means of ensuring that all land is protected from degradation.

The proposed scheme for the sustainable use of land and water and to increase agricultural production will be expensive, but, if properly implemented it will, among other things:

- Reduce the ill effects and cost of drought
- Reduce the loss of soil fertility in floods
- Reduce the damage to infrastructure by floods
- Improve the reliability of urban water supplies
- Increase agricultural production
- Reduce the costs of agricultural production
- Increase employment opportunities in rural areas

These advantages will far outweigh the costs involved.

The finer detail of the proposed scheme is beyond the scope of this paper, but the author will be pleased to assist in the development of the scheme, if called on to do so.

It must be stressed that improved agricultural production and the conservation of soil and water will not be achieved by community based land management committees or Landcare. There is a place for those organizations to encourage volunteer activity in some community tree-planting or weed-eradication schemes. However, the conservation of natural resources and the enhancement of agriculture require the services of permanent, full-time, salaried, qualified public servants to implement the scheme, and to encourage, advise, assist, and as a last resort insist, so that soil and water are conserved and agricultural production enhanced.

When Australia has acquired a record of achievement in properly husbanding its resources of soil and water it could contribute to world food security by providing the necessary skills to overseas countries where those resources have been sadly depleted. That would contribute greatly to self-sufficiency in food production in many countries which are currently in continuous crisis in that regard. This was demonstrated in Africa sixty years ago.

The key to permanently increased agricultural production anywhere is the maintenance of a cover of vegetation on the surface of the soil at all times, to protect it from erosion and to allow it to absorb water.

The benefits far outweigh the costs.

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