

**THE DEVELOPMENT OF AN AGRI-ENVIRONMENT POLICY  
FOR THE NEEDS OF A SMALL ISLAND COMMUNITY**

*(The Implementation of Dairy Farm Management Contracts in Guernsey to Reduce the Risk of Water  
Pollution and Enhance Wildlife Conservation)*

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## ABSTRACT

*Guernsey has a land surface area of 63 km<sup>2</sup> and supports an average population of about 60,000 people. The traditional industries of fishing, agriculture and horticulture still play a part, but are much diminished from previous times when they contributed substantially to the island's economy. Now, the importance of agriculture is mainly associated with the maintenance of the traditional island landscape and wildlife habitats, and the preservation of the island's own breed of dairy cow, the Guernsey.*

*Fresh water resources are critical to the island population and the Water Board has experienced increasing difficulty in collecting suitable rainwater from the island's surface streams to meet their requirements. Water supplies have been contaminated with nutrient run-off and leachate from horticulture and from agriculture.*

*Open farmland is referred to as the 'green lungs' of the island. It is divided into tiny fields by ancient flower rich earth banks and hedges, and farms tend to be an amalgamation of spatially fragmented fields rented under verbal annual agreements. The continual reduction in the number of farms and the increasing intensification of those that remained, led to fears that the island's natural wildlife habitats would be destroyed.*

*The paper describes the introduction of a new agricultural policy in the island that includes a 'dairy farm management contract' with farmers that provides financial security in return for reducing the quantity of milk produced to no more than that required for the local 'home' market and for complying with a wide range of measures to reduce the risk of water pollution, to support the island breed of cattle, to adhere to high standards of animal welfare, and to enhance landscape and wildlife habitats. It discusses measures adopted to monitor and evaluate the success of the scheme and considers future measures to improve its effectiveness.*

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# THE DEVELOPMENT OF AN AGRI-ENVIRONMENT POLICY FOR THE NEEDS OF A SMALL ISLAND COMMUNITY

*“The mind, like a parachute, is best kept open when in use.” Sir Crispin Tickell.*

## 1. Introduction

Many countries are developing ‘sustainable’ agricultural strategies, but the term is very broad and may be understood in different ways. Farming is increasingly influenced by strategies to reduce the risk of pollution and influence the way that the countryside is managed; whilst farming families are influenced by social and economic pressures, particularly the need to remain profitable and provide a worthwhile family income. There is therefore a crucial interdependence of biological and economic sustainability and it may be argued that by using a number of simple indicators, various strategies for sustainability can be identified, and the changes implemented may be monitored.

The countryside that we know is a product of a managed environment generated by the pattern of farming and land use. Increasingly, modern society values the semi-natural environment that is produced by traditional land management, including a clean water supply, semi-natural habitats, wildlife, the historic pattern of settlement and land use, rural landscapes and open spaces. The conservation of these resources is dependant upon the continuity of less intensive farming practices. As a consequence, rapid changes in farming methods, the increasing size of farms, improving efficiency, and the increasing intensity of production have led to growing concerns about environmental degradation and water pollution. The use of sustainability indicators can monitor these changes and highlight problems but also provide evidence of successful wildlife conservation.

Farming is just one way that rural resources of land, labour and capital can be used, and its use of scarce land resources is increasingly challenged by those who are concerned about sustainability and the conservation of the countryside rather than food production. Food production must therefore become more concerned with the preservation of the countryside and the welfare of livestock, if it is to retain public support and remain financially viable in the future.

There is also a concern that whilst technical changes have benefited consumers by reducing food prices, some of the production methods may not be compatible with the community’s values and goals. These concerns have brought about the introduction of a wide range of ‘quality assurance’ measures, that underlie the move towards sustainable ‘integrated production’ farming systems.

## 2. Island agriculture

Islands occupy a very small part of the world’s land resources, yet their rich natural and cultural heritage is of global significance. Their unique natural landscape and the biodiversity of their wildlife are particularly vulnerable to change.

Traditional agriculture in small island communities is becoming increasingly vulnerable, a problem made much worse by the globalisation of trade in agricultural products. Large-scale farming, particularly in areas where labour costs are low, can supply products at a price well below the cost of production in most island communities. This obviously undermines local production and can cause food safety and security concerns about imported food, whilst raising questions about the continuing role of farming in the rural community. When local farms expand and intensify their production to compete they come into conflict with efforts to maintain the island’s natural heritage.

Farming within islands, as on mainland EU States, is becoming polarised into large-scale strictly ‘commercial’ farms, farms that can succeed by providing niche products, and those farms that can

only survive by producing 'environmental' goods for local residents and tourists to enjoy. Within Guernsey the agricultural policy has been to provide fresh 'local' food for local people and to reduce exports to mainland markets.

In Guernsey we are chiefly concerned about maintaining demand for locally produced dairy products and so we pay particular attention to 4 major areas of public concern:

1. Wildlife Conservation – the impression that dairy farming is becoming more intensive and detrimental to the island's wildlife;
2. Environmental Pollution – slurry run-off and nitrate leaching from high applications of organic manures and inorganic fertilisers;
3. Animal Welfare - the public need to be assured that the husbandry of our cows meets the highest standards; and
4. Food Safety – hygienic quality and 'shelf life', the nature and content of milk fat, and contamination with additives, hormones and infectious agents.

These are the themes that the Agriculture and Countryside Board addressed in its 1998 (Billet d'Etat VII, 1998) and 2000 policy (Billet d'Etat III and XVII, 2000) for dairy farming and the environment in Guernsey.

## **2.1 Farming in Guernsey**

Most farms in Guernsey are dairy holdings and the only breed of cattle permitted on the island is the 'Guernsey', a traditional high butterfat and protein dairy breed. The Guernsey breed was exported to mainland Britain in the 19<sup>th</sup> Century, and became popular in North America, Canada, Southern Africa, New Zealand and Australia. However, the breed has been in decline in all these countries in recent years, and is becoming an increasingly endangered breed. A 'worldwide' breeding programme has been started whereby all pure bred Guernsey pedigree cattle are recorded on a database, evaluated and used to maintain the viability of the breed. However, realistically, many dairy herds specialising in the Guernsey breed will only survive in the future by producing either niche products for local people or CARE goods<sup>[1]</sup> that will benefit their local community.

Guernsey's community has supported dairy farming because it has preserved a more traditional way of life, the island breed of dairy cow and a working semi-natural landscape that provides habitats for wildlife. Dairy farmers actively manage two thirds of the open 'agricultural' land in the island, and there is constant pressure from horse owners and private householders to acquire agricultural land for alternative uses, such as horse paddocks, invasive leisure pursuits and extensive gardens. Even the development of large gardens, with planted trees and mown lawns, changes the 'feel' of the island from one of a relatively open landscape to that of a manicured urban community. But farming is no longer undertaken in a traditional way, and the increasing size of farms and improving efficiency has led to growing concerns about environmental degradation and water pollution, whilst others are becoming increasingly concerned about the welfare of animals in intensive farming systems.

As a consequence, agriculture has become as much concerned with the conservation of wildlife habitats and bio-diversity within the island, and the genetic survival of the island breed of cattle, as it is with the production of milk and locally produced dairy products. Environmental and wildlife monitoring will provide the evidence required to justify the continued maintenance and development of the agri-environmental scheme, as well as informing and acting as a catalyst for its improvement.

## **3. Agri-Environmental Issues and Problems**

The main agri-environmental problems within the island are:

1. nitrate pollution of surface and ground water by run-off and nutrient leaching;
2. pesticide pollution of surface and ground water by run off and leaching;

3. loss of landscape character and wildlife habitats.

Soil erosion and air pollution have not been significant problems in the recent past, although the practice of slurry storage and land application in the densely populated island is beginning to cause nuisance complaints about smell.

The main associated issues are:

1. the changing scale of island farming;
2. changing attitudes and values;
3. farm costs and profitability.

### **3.1 Nitrate pollution of surface and ground water**

The States Water Board collects water from twenty-six stream catchment areas within the Island and transfers this water into storage at a number of surface reservoirs prior to treatment for domestic and commercial supply.

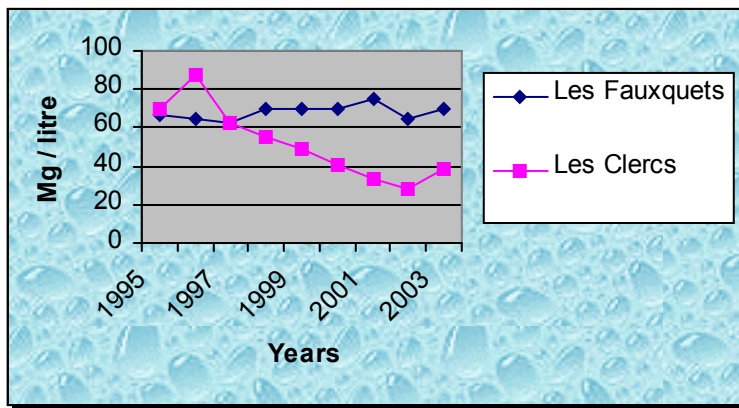
Nutrient pollution was first identified as a potential risk to water quality in the 1970's when elevated levels of nutrients (nitrogen and potassium), were identified in the Island's streams. The source of these increases was linked to the introduction of hydroponic rockwool growing media in the Island's horticultural industry and lack of suitable nutrient recovery systems (Jehan, 2003).

The island's water supply is mainly collected from the surface streams, with supplementary supplies from five wells operated during drought conditions. Three of the larger streams collecting water from the south of the island supply water to a flooded valley reservoir, whilst other streams all have pumping stations situated near to the coast that supply the island's storage reservoirs developed from redundant granite quarries. The nitrogen content in stored water decreases and this has allowed the island's Water Board to blend raw water containing excessive nitrates with stored water to supply treated water below the maximum admissible nitrate concentration set out in the UK Water Supply (Water Quality) Regulations, 1989, and EU Directives (Council Directive 75/440/EC; Council Directive 98/83/EC).

The protection of the island's water supplies became a major concern during the mid-1990's. Climate change is likely to make the island warmer and drier during the summer months and wetter during the winter, which means that there could be a greater requirement for stored water to satisfy the summer demand. Consequently, it is essential that fresh water supplies are not wasted due to their being contaminated with nutrients. Dairy farming has contributed substantial quantities of nitrates from soil leaching and run-off during the winter months, whilst run-off from protected glasshouse crops has rendered many streams un-collectable during the summer months. There were also concerns that the application of untreated animal manures to the land throughout the winter months caused unnecessary human health risks from pathogens that could contaminate the surface water supplies.

A 'Waste Strategy Assessment' published in 1997 alerted island authorities to the increased likelihood of water pollution caused by nutrient run-off from horticulture and run-off and leaching of nitrates from agriculture. Policy papers on 'Reducing the Effects of Pollution' from Horticultural and Agricultural Sources were published and discussed in the island parliament, the States, the following April 1998.

Table 1. Nitrate Concentration of two Island Streams



Source: States Water Board

Nutrient run-off management plans were developed for glasshouse crops grown in artificial substrates and the implementation of these has substantially reduced nutrient run-off to streams (Bell, F. R., and A Marchant, 1996), whilst a range of policies concerned with the collection, storage and correct application of cow slurry should have a similar, if slower, impact on nutrient run-off and leaching from agricultural land. Table 1 indicates the dramatic effect that can occur to individual streams following the cessation of nitrate rich run-off from horticultural units (Les Clercs stream), and the mean nitrate concentration in a predominantly dairy farming water catchment (Les Fauxquets stream).

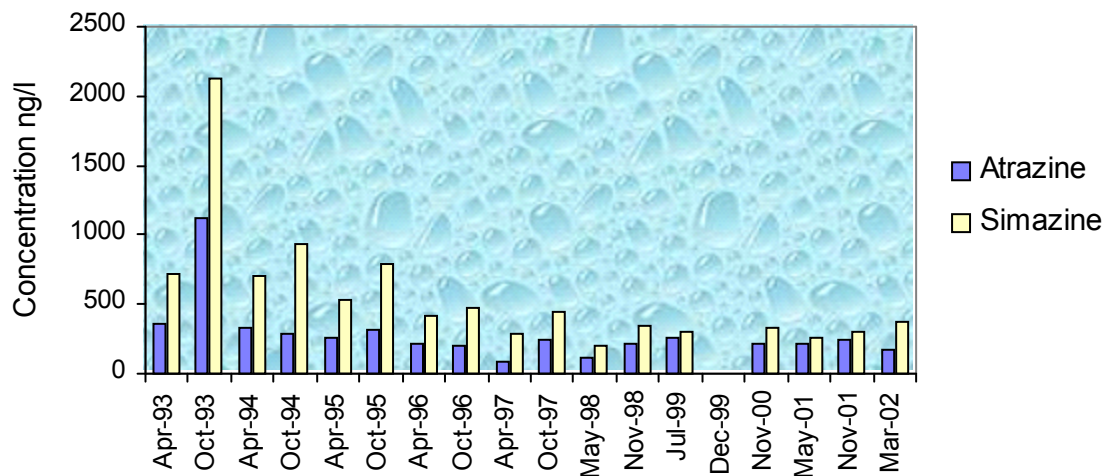
### 3.2 Pesticide Pollution

Pesticides are not widely used in island agriculture or horticulture, and many 'edible crops' (tomatoes, peppers, etc.) growers are now in 'farm assurance' schemes. These schemes lead growers to use biological control wherever possible in preference to pesticides. However, whilst the professional use of pesticides has reduced in recent years, the use of pesticides by amateur gardeners and in recreational facilities has increased substantially.

The only major water pollution concern in recent years has been an increase in the concentration of Simazine and Atrazine in water supplies. Atrazine is used in commercial agriculture for the control of weeds in forage maize crops, but Simazine and Atrazine were widely used as residual pesticides by gardeners, and for weed control around recreational facilities, such as tennis courts, and driveways.

The levels of Atrazine and Simazine residues in raw water, detected by the States Water Board, were increasing in the early 1990's and so these products were controlled in 1994. Use of these products was banned on the domestic market and the only exception was the specific licensing of products for use in agriculture and horticulture. This proved very successful as these two compounds were identified as being predominantly used for amateur domestic weed clearance.

Table 2. Total Atrazine and Simazine Loadings in Raw & Treated Water



Source: States

Water Board.

In addition to the control of the use of specific pesticides, the island authorities have made a concerted effort to ensure that all professional spray operators working in agriculture and horticulture are fully trained and that chemicals are stored in an appropriate manner. This has included:

1. Spray operators training courses: All farmers and growers must undertake a course of training and pass an examination to be awarded a 'Certificate of Competence in the Use of Pesticides' by the NPTC<sup>[2]</sup>. Updating courses are held regularly and there is now a move for qualified operators to join a National Register of Sprayer Operators (NRoSO)<sup>[3]</sup>.
2. Control of the purchase of professional pesticides: Only those operators that have been awarded an NPTC Certificate of Competence can purchase professional pesticide products within the island.
3. Pesticides storage: All farmer's and grower's pesticides stores must be inspected and approved by Health and Safety Executive / States Water Board.
4. Licensing scheme: The use of environmentally sensitive pesticides, such as Atrazine, Simazine, Aldicarb, etc., are controlled by specific license for individual crops issued by the Health and Safety Executive.

As a result of these measures pesticide residues remain at a very low level in public water supplies.

### 3.3 Loss of landscape character and wildlife habitats

The most extensive areas of agricultural land remaining today are on a plateau in the southern part of the Island, whilst the greatest concentration in housing is in the east and north of the Island where the land tends to be low lying and poorly drained.

It is difficult to overemphasise the effect of the topography on the quality of the soil, and the landscape. The best farming land<sup>[4]</sup> with deep free draining loamy soil covers much of the southern plateau of the island. This is characterised by fields enclosed with earth banks that are mainly covered with grass and wild flowers, rather than hedges, and may be considered as vestiges of the old meadows that existed in past times before farming techniques became more intensive.

The Guernsey field boundaries and hedge banks are historical features that have remained almost the same as when the island was first fully mapped in 1787. The Duke of Richmond Map detailed all the land divisions within the island at that time and most field boundary banks have remained as havens and corridors for wildlife in farmed land ever since. The loss of field boundaries is now a real concern from a landscape, wildlife, and cultural heritage point of view. Traditional farming practices and

inheritance laws have supported the retention of these boundaries but, with increasing agricultural intensity and the larger scale of farm machinery, it has become important to protect these traditional features.

Although the removal of hedge banks is considered to be development and so requires planning consent, the law has not been adequately enforced and also only offers protection to “any wall, hedge, bank or fence which is visible from any public or other place to which the public has access” (Island Development (Guernsey) Law, 1966). This means that many of those banks are now vulnerable, especially to gradual undermining and damage by ploughing or cultivating too close to the bank on each side, or by allowing cattle to gradually break the banks down by rubbing or walking over the banks.

Likewise, the flower rich wet meadows that were previously used for summer grazing with cattle, or for hay making, are now either becoming derelict, are being used for riding horses, or are being fertilised and ‘raised’, each of which destroys the natural flower rich meadows and wildlife value. The best flower rich meadows have been designated as Sites of Nature Conservation Interest but there is no legal protection and the authorities are concerned that, given the ‘Guernseyman’s’ natural independence and reluctance to be ‘dictated to by the authorities’, many valuable areas will be ‘lost’ before protective legislation is enacted.

Horses, which are very popular in the urban community, are notoriously destructive of wildflower meadows because the combination of hoof damage and overgrazing causes rapid deterioration. Land drainage of these wet meadows was not feasible, which is why many have survived for so long, but now land owners often wish to raise the land by scraping back the top soil, introducing builders rubble or sub-soil from building sites, and replacing the top soil. Increases in tipping charges at official tips have made this quite a profitable venture and the island’s authorities have to be constantly vigilant to stop this practice.

At the same time concerns were raised about the intensification of dairy farming as the numbers of farms declined and those that remained grew progressively larger. There was an increasing danger of wildlife degradation, and particularly of field boundary loss as farmers sought to amalgamate areas of land and obtain larger fields for their herds of dairy cows and the larger equipment that is now commonplace on farms. A solution had to be found for all these increasing problems but one that sought to maintain the profitability of farming in the island, as some other occupations offered a substantially better standard of living.

The introduction of the farm management contract should at least help to protect the flower rich wet meadows that are currently used by dairy farmers and, as the scheme is extended, should help to protect some of the other areas too, but much will depend on the enactment of appropriate legislation.

### **3.4 The changing scale of island farming**

There has been a significant change in the traditional agricultural and horticultural production of the island in recent years. Fifty years ago there were 353 dairy farmers in the island and the average size of farms was 38 vergees, or 6.2 hectares. The farms kept an island milking herd of 2179 cows, an average of just over 6 cows per herd; and the average milk yield was 2500 litres per cow. By 1990 the island herd had remained at 2181 cows and the number of herds had reduced to 72 (the average herd size had increased to 30 cows); the milk yield had almost doubled to 4025 litres per cow. The average land used by each farm had increased to 98 vergees or 16 hectares.

The number of dairy farms in the island has decreased further in the past 10 years, reducing to 60 by 1995 and to 30 by 2000, largely as a consequence of natural retirement from the industry, but also due to improvements in the hygienic quality of milk, animal welfare standards and the avoidance of environmental pollution. Cow numbers declined by 17% to 1814 by 2000, but milk production had increased by 30% to an average of 5265 litres per cow, whilst several individual herds had an average



milk production of over 7000 litres per cow.

The Guernsey tomato growing industry has suffered a much greater decline. Fifty years ago there were over 2000 individual growers in the island, cultivating tomatoes under glass. They produced tomatoes for the protected English market but when the UK joined the EU in 1972 the Guernsey tomato growers lost their special status. Increases in fuel costs and labour charges marked the continued decline of the industry. Many tomato growers initially diversified into flower and other edible crops, whilst a number of progressive new horticultural businesses were set up and these remain, providing substantial export earnings for the island.

The number of tomato and flower growers declined rapidly during the 1980's and 1990's due to failing competitiveness for their export market to the United Kingdom. By 1995 a substantial number of those that remained were growing protected crops in artificial substrates such as 'rockwool', which resulted in considerable run-off pollution by nitrates. The result was that by the mid-1990's much of the collectable fresh water in the island had a high nutrient content at certain times of the year.

### **3.5 Changing attitudes and values**

Independence is often the most notable trait of an islander, and is a particular characteristic of farmers. Farmers appear to resist and distrust changes imposed upon them, but as businessmen they have often been at the forefront of technological change. Measures to reduce water pollution and influence the way that they farm their land have been resisted in the past and often, although individuals may understand the logic behind such measures, they have privately explained that they really dislike being 'told what to do'!

In England where a wide range of environmental and conservation schemes have operated for many years, dairy farmers have not joined in large numbers. Most conservation schemes have been directed at farms in the 'less favoured areas' where beef and sheep farming was the norm. In recent times

MAFF<sup>[5]</sup> schemes for farmers in 'Environmentally Sensitive Areas' of the UK were mainly joined by the owners of 'beef and sheep' farms, whilst a Pilot 'Nitrate Sensitive Areas' Scheme for lowland farms in nitrate vulnerable areas was very poorly taken up by dairy farmers, who were often the main culprits of nitrate pollution. Although such schemes might now be more acceptable as dairy farm businesses are less financially viable than before, there was obviously a challenge to introduce an environmental and countryside management scheme to Guernsey that would be widely acceptable.

Recent research in Scotland suggested that 'farmers attitude towards conservation may develop from the value that the individual places upon farming; if he values it as a way of life he may wish to conserve and sustain the land in order that succeeding generations of the family may enjoy the same way of life. Conversely, those who value farming as a business may wish only to maximise profit and production without the thought of family succession or sustainability.' (Willock, 1999). If true, this may present a problem in Guernsey as more than 80% of the farmed land is rented under annual tenancy agreements, and many farmers do not have family members in readiness to carry on the business.

### **3.6 Farm costs and profitability**

Farming in the island had been under threat from higher costs due to insularity and the greater costs of production. The small fields and fragmentation of land in the island contribute to much higher labour and machinery costs than normal for dairy farming on the mainland, whilst building costs, mechanisation, fuels, animal bedding and concentrated animal feeds are all much more expensive in the island than in England.

Until recently, the number of dairy cows in the island had remained relatively stable over the past decade, but milk yields had increased dramatically as the benefits of improved breeding and feeding had their effect. As farm numbers declined, mainly due to the retirement of the owners of many of

the smaller herds, the remaining farms increased in size so as to be more profitable. These intensively managed farms had larger dairy herds and often produced more milk per cow, due to improved feeding and management. As a consequence, dairy farms were producing too much milk for local consumption, and the surplus was being made into dairy products, mainly cheese, for export to the United Kingdom. This caused a reduction in the milk price paid to producers and consequently to falling farm profitability, which in its turn stimulated farmers to expand their herds further and produce even more milk. This cycle of intensification was broken by the introduction of the Countryside Management Scheme. The Scheme reduced the production of milk in the island to the amount required for the local consumption of fresh milk; the export of dairy products ceased, and the profitability of individual farm businesses increased.

#### **4. The Guernsey Countryside Management Scheme**

It is accepted that whilst farming is the cornerstone of Guernsey's rural economy, agriculture has a 'multifunctional role', delivering not just food but other public goods, such as the responsible management of livestock and the protection and enhancement of the countryside.

The Countryside Management Scheme is a broad-based agri-environment scheme developed specifically for dairy farmers in Guernsey. It provides financial assistance on condition that farms are managed in accordance with the following objectives, whereby farmers:

- enhance the value of farmland for biodiversity;
- sustain the beauty and diversity of the landscape;
- adopt 'responsible' less intensive management;
- enhance existing habitats and create new wildlife habitats;
- conserve archaeological sites and historic features;
- improve possibilities for countryside enjoyment; and
- enhance surface and groundwater quality.

The Board's initial proposal was a completely de-coupled scheme, where payments were not linked to the production of milk but paid on the area of land managed by each farm. However, liaison groups indicated that farmers believed that, due to the unusual Guernsey land tenure system, most of the financial benefits would accrue to landlords as higher land rental values. As the Scheme would not benefit farmers as much as intended, they would be less willing to take part. Farmers were keen to develop a cross-compliance scheme whereby farm payments were made based on the volume of milk produced, but linked to the delivery of specific requirements. This was accepted by the Agriculture and Countryside Board and a scheme was devised whereby farmers could claim whole farm management payments for complying with a wide range of production, livestock breeding, animal welfare, environmental protection and wildlife conservation measures. The amount that any farm could claim was limited by the contract to supply a specific volume of milk in any 'contract' year.

One disadvantage of the Guernsey land tenure system is that specific areas of land cannot be entered into the contract for a fixed term, as some of the land used by a farmer may be 'lost' in any year. However, this has the merit that, being annually negotiated, the 'contract' can be varied to gradually enhance the 'consumer' benefits.

##### **4.1 The Dairy Farm Management Contract**

The 'Dairy Farm Management Contract' is a 'whole farm' approach to providing financial benefits in return for complying with a range of specific requirements. The scheme has the following main features:

- It is available for all eligible agricultural land;
- Participation is voluntary;
- Individual farm targets will be met that are adequate and appropriate; and

- Wherever possible, these targets will be SMART; that is, Specific, Measurable, Achievable, Realistic and Timed.

### ***Basic Level Payments***

The amount of payment is determined by the litres of milk delivered, provided that the farm complies with the allocated monthly 'quota', and adheres to the general conditions defined by the scheme.

These general conditions include:

- Deliver the enhancement items specified in the Farm Biodiversity Action Plan;
- Comply with the management prescriptions in the Board's 'Management Guidelines';
- Adhere to stocking rate restrictions and prevent overgrazing;
- Construction of sufficient slurry storage facilities for the dairy herd (4 months slurry storage by 1<sup>st</sup> October 2004);
- Follow the recommendations in a manure management plan, including a 3 month closed period (1<sup>st</sup> October – 31<sup>st</sup> December) for the application of organic manures, slurry and dirty water to the land;
- Follow a Nutrient Management Plan to maximise the nutrient value of slurry and farmyard manure and select the most appropriate fertilisers for use;
- Avoid damaging unimproved grassland and flower rich meadows;
- Protect and retain all habitats, landscape, water and heritage features;
- Protect and retain existing field boundaries, hedges, walls, banks and streams;
- Avoid pollution of water, soil and air;
- Adhere to environmental guidelines and regulations relevant to the farm;
- Keep appropriate farm records and provide information for the confidential calculation of 'Farm Financial Accounts' and a 'Farm-gate' Nutrient Balance.

In addition each farm must comply with a monitored Quality Assurance scheme to ensure high standards of herd health, animal welfare and milk hygiene.

### ***Farm Biodiversity Action Plan***

A Farm Biodiversity Action Plan has been developed with each farmer to introduce the concept of biodiversity to the farm and help each farmer to take the first steps towards improving the variety of wildlife in the countryside. It developed a number of zero-budget and low cost items, including:

Over the whole farm:

- Permit surveys of botanical species, invertebrates, wintering or breeding birds in any areas of particular interest;
- Maintain a buffer strip adjacent to all watercourses;
- Protect and manage traditional field boundaries for wildlife;
- Erect or maintain bird boxes as appropriate and monitor resident populations;
- Undertake a small wildlife project.

In specific areas

- Low input conservation management should be considered for certain cropped and grassland areas. Such as:
  - Arable
    - Conservation headlands / whole fields managed with reduced inputs of fertilisers and no pesticides
    - Cropping managed with unfertilised / unsprayed cereal crops;
    - Conservation crops to provide seeds and cover for wild birds.
  - Grassland
    - Field margins managed without fertiliser or pesticides;
    - Whole / part fields managed with limited fertilisers and no pesticides;

- Conservation grazing with cattle or sheep on low intensity permanent pasture;
- Late baled hay or silage from low intensity permanent pasture.

The Biodiversity Action Plan is prepared by the UK ‘Farming and Wildlife Advisory Group’ (FWAG) working under contract to the Agriculture and Countryside Board. A breakthrough occurred when a local group of this farmer led organisation was formed in conjunction with the ACB in Guernsey. Local farmers could then feel themselves to be taking the lead in making the necessary changes in their farm management, and so the advice given was much more acceptable. The local group has a locally respected farmer as chairman, and more than half of the local dairy farmers have joined the group. The group has been a great success, organising local farm walks and events that have enjoyed wide support. The Agriculture and Countryside Board has supported the local group and is a corporate member of the National FWAG organisation. In this way the farmers have been encouraged to ‘own’ the ‘Farm Action Plans’ that have resulted and play a real part in wildlife conservation, but the objectives have been set by the Agriculture and Countryside Board.

Monitoring of the ‘farm action plans’ has indicated that farmers are more likely to carry out wildlife enhancement projects on land that they own rather than on land that they rent. Therefore the peculiar land tenure system in Guernsey, where farmers rent the majority of the land they use as individual fields on an annual tenancy, discourages farmers from taking worthwhile action for wildlife conservation. An attempt is now being made to ensure that conservation is undertaken on the 80% of the land that is rented on an annual tenancy as well as the 20% that is owner occupied.

## 4.2 Monitoring and evaluation

The success of the management scheme will be determined by regular monitoring and evaluation. This will include the:

- monitoring of hedges and boundary banks to ensure that they are not being damaged and that they are being managed appropriately;
- intensity of stocking (using a calculation of livestock kept on the land area) to ensure that maximum stocking density is not being exceeded;
- quality assurance monitoring for hygiene and animal welfare;
- number of farms building slurry stores and following a manure management plan;
- number of water pollution incidents reported by the States Water Board (these have reduced to a low level in recent years);
- calculation of a ‘farm-gate’ nutrient (nitrogen) balance; and
- monitoring the wildlife and countryside aspects of the scheme, including:
  - Appropriateness monitoring (was the management prescription advised appropriate?),
  - Compliance monitoring, and
  - Ecological condition monitoring.

Many of these do not readily form usable indicators of sustainability, although a number of simple indicators can be developed. The most appropriate long term indicators might include the area of land under management agreement, the number and land area of ‘Sites of Nature Conservation Importance’, the length of boundary banks retained, and, of particular importance, those measures associated with water quality (nitrates and pesticide residues).

At first sight the use of a nutrient balance as an indicator appears particularly relevant, and nutrient balance calculations form a valuable check on the efficiency of individual farm systems. However, it is noticeable in Guernsey, where a farm-gate nutrient balance is calculated for each dairy farm as a contract condition, that livestock farms have a higher annual surplus of nitrogen per hectare than mixed dairy and potato farms. Potatoes, which are the main arable crop in the island, are usually considered to be a particularly ‘leaky’ crop, contributing a substantial quantity of nitrates into the ground water. Grassland systems with grazing livestock that return a quantity of manure and urine to the land tend to have a high nitrogen surplus, whereas arable crop systems tend to utilise more of the

available nitrogen in the saleable crop. This is corroborated by studies that have shown that, for a given nitrogen surplus, less nitrogen is leached from grassland than from arable crops (Scholefield et al, 1991).

A recent ADAS study (Lord et al, 2002) explored this anomaly and highlighted the inherent risk that “focussing on nutrient balance calculations as indicators of progress towards improved water quality could distract attention from alternative more cost effective approaches to the problem.” The study noted that “Nitrogen surplus was shown to vary widely, being greater in grassland and other livestock dominated areas than arable areas. In contrast, river nitrate concentrations tended to be greatest in arable areas.” Thus, the conversion of grassland to arable cropping within a catchment might well decrease the calculated nitrogen surplus but increase the losses of nitrogen to water supplies. This highlights the potential danger of apparently valuable indicators.

## **5. Review of the Countryside Heritage Aspects of the Guernsey Dairy Farm Management Contract Scheme**

A SWOT analysis was undertaken to identify the key strengths, weaknesses, opportunities and threats of the Dairy Farm Management Contract. The following were identified:

### ***Strengths***

- Formal recognition that the dairy industry can deliver countryside heritage benefits and that this service should be paid for by the community;
- An holistic approach to the environment, incorporating in depth consideration of countryside heritage, environmental considerations, pollution control, animal welfare and energy use;
- Engagement of all dairy farmers in the delivery of environmentally sustainable agriculture;
- Introduction of detailed environmental guidelines designed to conserve many aspects of the island’s countryside heritage;
- Low operating costs (minimising administrative costs).

### ***Weaknesses***

- Lack of a mechanism to ensure the appropriate management of specific areas / features of high countryside heritage value;
- The scheme is not currently available to non-dairy farmers;
- Lack of involvement of landowners.

### ***Opportunities***

- Support the management of targeted areas of high existing and potential countryside heritage value;
- Provide new public access opportunities;
- Extend the scheme to include other types of farming;
- Engage landowners.

### ***Threats***

- That the States decides to reduce or halt payments if the scheme fails to deliver significant environmental benefits;
- That a cessation of payments under the scheme would lead to significant adverse consequences for the island’s environment and its dairy farmers.

## **6. Future developments**

The island’s agriculture and countryside policy is subject to revision every 5 years. This provides the

opportunity to make revisions to the Dairy Farm Management Scheme and to promote change. Initial discussions have already started with farmer's leaders to agree changes in the scheme to start as from 1<sup>st</sup> January 2006. Much will depend on the economic situation within the island and on the perception that farming and countryside conservation remains necessary and worthy of community support. Much of this will be determined by monitoring the results of the scheme to date, to show that farming has changed to take account of the community's legitimate environmental concerns, that animal welfare standards are being achieved and that farmers are actively managing the countryside for the benefit of wildlife.

One aspect of the scheme, highlighted above, is that the current system provides no additional benefits for those farmers who are actively doing more to improve welfare standards and enhance the countryside. As a consequence it has been proposed that the current scheme is enhanced to provide additional payments for those farmers that choose to do more for the environment, animal welfare, countryside conservation, and public access. Provisionally titled 'Rewards', small 'Level 2' payments could be made available for:

- Achieving a target 'Farm-Gate Nutrient Balance';
- Less intensive farming practices;
- Complying with the higher animal welfare standards required in the RSPCA 'Freedom Foods' Certification Scheme;
- Specific management of 'priority habitats'; and
- Greater public access, including educational access.

Level 3 payments might be available for organic conversion and continued organic management if market demand is insufficient to support higher priced commodities, and organic farming was considered to be a valuable objective.

## 7. Conclusion

Guernsey's agricultural policy is a 'journey' of change towards more sustainable farming practices, whereby farmers have been encouraged to innovate by introducing sound environmental, animal welfare and countryside enhancement measures. The most fundamental change, from 'production led' policies to environmental, welfare and wildlife enhancement strategies, has already been taken, but now the objective is to refine some of those changes and to improve the targeting to obtain real long term benefits.

Monitoring and evaluation will ensure that sufficient progress is being made and inform the change process so that the scheme can be improved. Environmental indicators are linked to this process. Monitoring should be simple, robust, objective, readily measurable over a long period of time, and at a reasonable cost. Simple, readily understood measures, such as the quality of raw water and the area of land under countryside management agreement, are considered the most appropriate as environmental indicators. The challenge is to devise suitable indicators that can be used to effect change towards a more sustainable lifestyle.

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[1] The term 'CARE' goods was coined by Professor John McInerney in his inaugural lecture at the University of Exeter in 1984. It was an acronym from the words Conservation, Amenity and Rural Environment designed to represent the diverse array of non-food goods and services that rural resources can provide, but which fall largely outside commercial activity.

[2] National Proficiency Tests Council, National Agricultural Centre, Kenilworth, Warwickshire, CV8 2LG, UK.

[3] National Register of Sprayer Operators, NPTC, NAC, Kenilworth, Warwickshire, CV8 2LG, UK.

[4] The Soil Survey of Guernsey (ADAS, 1989), mapped and classified the soils and land of Guernsey using the MAFF Agricultural Land Classification.

[5] Ministry of Agriculture Fisheries and Food, forerunner of the UK Department of the Environment, Food and Rural Affairs (DEFRA).