

**Agriculture and Rural Development Committee inquiry into agri-environmental schemes in Wales**

**Response to National Assembly for Wales consultation**

**By**

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Terms of reference:

*To consider the effectiveness of Tir Gofal in delivering its objectives and to make recommendations for the future shape and funding of an integrated and tiered system of agri-environmental schemes in Wales.*

This paper outlines the response from the Institute of Rural Studies to the Assembly's Agricultural and Rural Development Committee's inquiry into the future of agri-environmental schemes in Wales. Our response is largely centred on two research projects that have been undertaken within the Institute to examine Welsh agri-environmental schemes. We first outline the main findings from these two projects. This is followed by our comments on the current Tir Gofal scheme, and then our comments on the Assembly's proposals for a tiered Tir Gofal scheme. Finally, for your information, we append two short papers that summarise the two research projects mentioned above.

***Institute of Rural Studies into Welsh Agri-environmental schemes***

The first project of interest is a WWF commissioned report that examines, through a series of case studies, the environmental and economic benefits of agri-environmental schemes in Wales (Christie and Adams, 2000). The report concludes that Welsh agri-environmental schemes make a significant contribution to (1)

Wales' biodiversity and (2) the income of participating farmers. Based on these findings, it is recommended that expenditure on Tir Gofal should be increased by four-fold to fully meet Wales' biodiversity potential. The executive summary from this report is appended to this response.

The second study, which has been undertaken as part of a PhD research studentship, investigates public preferences (expressed in economic terms) for environmental goods delivered through agri-environmental schemes. The methodology used to derive these benefit estimates was the choice experiments environmental valuation method. The main findings from this research include the following:

- On average, Welsh households stated that they were willing to pay (WTP) an extra £1297 per annum in taxation to attain the range of benefits associated with the compulsory elements of the current Tir Gofal scheme (from a baseline of traditional farm practices) and £1375 per annum to attain the benefits associated with the combined compulsory and voluntary elements of Tir Gofal. What this finding demonstrates is that the general public appear to favour the basic levels of agri-environment schemes that maintain environmental quality as opposed to those prescriptions that aim to create new habitats etc. However, it should also be noted that these values are average values and that further analysis reveals that certain members of the public do have significantly higher values for the enhanced prescriptions than for the basic prescriptions.
- Perhaps of more interest than the overall value of Tir Gofal, are the values associated with individual prescriptions within Tir Gofal. The maintenance of landscape features (£537) and the reduction of pollution from pesticides / fertilisers (£430) were found to command the highest WTP amounts. Securing farmer's income (£239) and the creation of rural employment (£155) were also considered to be important elements of agri-environment schemes. Finally, the enhancement of countryside access was found not to be considered important.
- It was also found that members of the public attained negative welfare from a decline in environmental quality from the baseline of traditional farm practices. This indicates that the public would not want to see environmental quality decreasing on Welsh farms due to increased specialisation / intensification.
- The above values relate to the average WTP derived from Welsh residents. Through the adoption of latent class modelling, the research was also able to identify which groups of people attain the greatest benefit from different elements of agri-environmental schemes. For example, a group of respondents that were identified as 'socially aware' were found to have significantly higher WTP amounts (£4272) than the other respondents. Further analysis using this type of analysis would also enable those respondents who do not value agri-environmental schemes to be identified.

### *Comments on existing Tir Gofal arrangements*

In the next section, we utilise the findings from the two studies outlined above, along with some personal views, to highlight some of the strengths and weaknesses of the current Tir Gofal scheme.

### **Strengths of current Tir Gofal scheme**

The introduction in 1999 of the Tir Gofal agri-environmental scheme in Wales can be regarded as a significant improvement on the previous piecemeal suite of schemes that included ESAs, Habitat scheme,

Moorland scheme, and Tir Cymen. In particular, the benefits that Tir Gofal delivered over earlier schemes include:

- All farms (over 3 Ha) in Wales are eligible to apply to Tir Gofal. This is an improvement on the limited geographical coverage of some of the earlier schemes (Tir Cymen and ESAs). Thus, in theory all Welsh farmers could potentially benefit from entry into Tir Gofal.
- Tir Gofal requires the whole farm to be submitted into the scheme. The benefit of this is that it ensures that farmers protect and enhance all important habitats on their farms, whilst not intensifying production on the rest of the farm. Some of the earlier schemes were only applied on a part farm basis. The example of Tyle farm (reported in Christie and Adam, 2000) provides a good example of how the requirements under a whole farm scheme ensure the protection of important habitats; in this case the hedgerows on the farm.
- The Tir Gofal scheme has also been demonstrated to significantly enhance biodiversity on farms and thus helps meet Wales' biodiversity obligations. The case studies reported in Christie and Adams (2000) provide good evidence of the potential biodiversity enhancements that can be attained through participation in an agri-environmental scheme.
- Tir Gofal also makes an important contribution to farmer's income, which again is highlighted in the case studies reported in the WWF report (Christie and Adams, 2000).

### **Weaknesses of current Tir Gofal scheme**

Tir Gofal, in its existing form does, however, have its limitations.

Perhaps the most significant of these is that currently there are approximately only ca 100,000 Ha (6% of all agricultural land in Wales) or 1500 farms (7.5% of all eligible farms in Wales) entered into the Tir Gofal scheme. If we expand this estimate to also include farms that are signed up to other agri-environmental schemes and the organic farming scheme, this figure is increased to 23% of agricultural land in Wales, which almost meets the Assembly's commitment to have 25% of Welsh agricultural land entered into an agri-environment scheme by 2003. Future funding commitments outlined in the Welsh Rural Development Plan are likely to enable the amount of land entered into Tir Gofal to increase to 200,000 Ha by 2004. However, much of this increase will be offset by farmers reaching the end of their existing agreements under other agri-environmental schemes. Thus, predictions made by the Assembly show that by 2004 around 28% of Welsh land will be entered into an agri-environment scheme by 2004. Clearly the Assembly is making progress towards increasing the proportion of Welsh land under agri-environmental schemes. However, it also needs to be highlighted that around 75% of Welsh farmers will not be able enter into and therefore benefit from agri-environmental schemes. This, coupled with the fact that support for farming is moving away from production subsidies to payment for environmental goods, will undoubtedly mean that many farmers will lose out under existing arrangements. Clearly this will have significant implications for the viability of Welsh farms, and we recommend that the funding for agri-environmental schemes be increased to allow a greater participation in such schemes in Wales.

A further dimension to the argument to increase the area of land under agri-environmental schemes was

noted in the WWF report, which highlighted the wildlife and biodiversity benefits associated with agri-environmental schemes (Christie and Adams, 2000). This report concluded by recommending that in order to meet Wales' biodiversity obligations the Welsh Assembly should aim to provide funding to allow at least 50% of Welsh farms to enter into agri-environmental schemes. To achieve this, the report recommended that funding for Tir Gofal be increased four-fold by 2006/7 from the current budget of £21.4m to £91.6m. Such an increase could be achieved by moving a higher proportion of Pillar 1 funds into Pillar 2.

There are also a number of other limitations of the current Tir Gofal scheme that the Assembly's CAP Reform Steering Group have highlighted in its draft paper on the possible future development of agri-environmental schemes in Wales. These limitations include the inability of the current Tir Gofal to tackle environmental problems such as diffuse pollution, the need to enhance biodiversity, the decline in the quality of traditional landscapes, damage to the historical environment, and the increased risk of flooding. The findings from the Hyde and Christie (2002) valuation work demonstrate that members of the general public would also support a move to deal with these issues, and in particular those relating to the control of pollution and the maintenance of traditional landscapes. We therefore agree with the Steering Groups recommendations that these are important issues, and that they need readdressing in future reform of agri-environmental schemes in Wales.

### **Response to the Assembly's CAP Reform Steering Group proposals**

In response to the mid-term review of the CAP and to address some of the issues highlighted above, the Assembly have proposed a tiered agri-environment scheme. The proposed scheme includes four tiers, summarised below:

- Basic obligations for which no payment is available
- An entry level whole-farm agri-environment scheme which is widely available (TG1)
- Payments for additional environmental benefits (TG2, Organic farming scheme and Countryside grant scheme)
- Higher payments for co-operative schemes.

Detail of these proposals can be found in the Assembly's draft paper. We now discuss each of these levels individually, before making more general comment.

#### **Basic obligation**

The proposal that farmers should be required to adhere to codes of good environmental practice is to be welcomed. Although full details are not presented in the Assembly's draft paper, it is considered that this proposal is essential in order to (1) meet existing and future environmental protection and animal welfare legislation, (2) ensure the general public that public monies are only made available to those farmers that follow good environmental practices. It is suggested in the draft paper that only the Tir Gofal payments will be conditional of meeting these basic obligations. Although we fully support making Tir Gofal payments

conditional in this way, we would also wish to propose that this cross compliance arrangement be extended to include all forms of public support for agriculture. The rationale behind this argument is that 'public monies should not be used to support farmers that damage the environment'. In addition, it should be recognised that existing (and future) environmental legislation must have powers to prosecute farmers who fail to meet certain standards and therefore farmers should already be meeting many of these basic obligations. We also welcome the proposal that capital grants will become available under the Countryside Grant Scheme to support capital expenditures required to meet the basic obligations. Such grants are currently available in Ireland under the REPS scheme, and have been demonstrated to be very successful in reducing pollution from farms.

## **Tir Gofal level 1**

We strongly welcome the proposal to introduce a basic level to Tir Gofal and generally agree with the proposals made. Our comments include the following:

- We believe that adequate funds should be made available to ensure that all farmers wishing to enter TG level 1 in the first year of the scheme can do so.
- Payments made under TG level 1 should be based on existing TG payments, plus an additional supplement that compensates for any reductions in the production subsidies currently paid to farmers.
- Consideration should be given to combining TG level 1 and Tir Mynydd since there is likely to be significant overlap in some of the aims of these schemes. Alternatively, greater consideration should be given to ensure that such overlaps are removed.
- The basic requirement under TG level 1 should be linked into a Welsh Farm Assurance scheme and that this scheme should be used as a marketing tool to promote high quality Welsh produce in terms of both its animal welfare and environmental standards.
- We are happy with the proposal that farmers are required to safeguard existing wildlife habitats and landscape features or manage at least 5% of the farm for wildlife. In particular, the valuation research (Hyde and Christie, 2002) demonstrated that these prescriptions were most valued by members of the public.

## ***Payments for additional environmental benefits.***

We are generally happy with the proposal that farmers may apply for additional payments for environmental benefits through Tir Gofal level 2, Organic Farming scheme and the Countryside Grant scheme. Although details regarding how this might work are not presented in the Assembly's proposal, we note some points for consideration.

- It is unclear from the proposals whether farmers would be eligible to apply for all three schemes. Our recommendation is that they should be. To allow this to happen the schemes need to be clearly

differentiated and any possible interactions between the management prescriptions under the different schemes need to be considered and sorted out. Examples of such interactions may be found in the response prepared by the Organic Centre Wales.

- Adequate resources need to be made available to allow more farmers to participate in these schemes. As mentioned earlier, the WWF report suggested that 50% of farmers would be required to participate in TG in order to meet Wales' biodiversity obligations.
- All three options should be described to farmers, along with TG1, within a single document since this would reduce confusion.

### ***Co-operative action***

We welcome the proposal that additional payments will be made available for co-operative actions. The benefits of co-operative action are clear: it will enable environmental improvements to be gained on a landscape / water shed scale, as opposed to the fragmented benefits currently delivered in Tir Gofal, where farms are dispersed throughout the Principality. The benefits of focusing conservation effort within large areas were demonstrated in Tir Cymen.

### ***General Comments***

In our view, the proposals outlined by the Steering group provide a significant improvement to the Tir Gofal scheme. In particular, we welcome the fact that the scheme will be made available to more farms and also that the scheme now encourages co-operative action. Clearly, the detail of the scheme still needs to be worked on; however, the principles are there.

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**Money makes the countryside go round: making the case for increasing countryside spend on agri-environmental schemes in Wales.**

**Report to WWF**

**By**

**Christie M and Adam S**

**February 2000.**

## Executive Summary

### *Aim of the research:*

The aim of this report is to review agri-environmental schemes in Wales and to assess the extent to which they deliver environmental and socio-economic benefits.

### *Key recommendations*

- The annual budget for the Tir Gofal agri-environmental scheme is currently set at £5.5 million, rising to £21.4 million in 2006/07. This will enable around 2,335 Tir Gofal agreements to be made on Welsh farms.
- This report recommends that a realistic participation target for Tir Gofal is 10,000 agreements (50% of eligible Welsh farms). This level of uptake would make a significant contribution towards meeting Wales' biodiversity obligations, as well as supporting farm incomes.
- To achieve this target, funds allocated to Tir Gofal need to be increased over four-fold to £91.66 million per annum.
- This report recommends that the government make this financial commitment to the Tir Gofal agri-environmental scheme.

### *Method*

Four case study farms are examined in this study. The first two farms were included to illustrate the significant benefits that agri-environmental schemes can bring in terms of protecting and enhancing the biodiversity on farmland. The remaining two farms provide examples of farms that were not accepted into agri-environmental schemes due to the lack of funds. These farms provide an example of the lost opportunities for protecting threatened habitats and species. Based on the evidence gathered in this research, predictions are made regarding the extent to which funding needs to be increased in order to meet the UK's legal obligations for protecting its biodiversity.

### *Benefits*

To demonstrate the benefits that agri-environmental scheme can generate, four case study farms were examined.

Penmaen Isa is a 146 Ha lowland and upland beef and sheep farm situated in west Wales. The farm has been in Tir Cymen since 1992, and also has two SSSI management agreements. The scheme agreements are

perhaps unusual in that they require the farmer to increase, in a controlled manner, the stocking density on the farm's marshland areas. This practice has enhanced these wetland habitats, resulting in significant increases in their bird populations including lapwings, redshanks, and Greenland white-fronted geese. All of these birds are listed as species requiring special protection. Without the aid of these schemes, it is likely that these important habitats would have been lost.

Tyle farm is an example of a typical Welsh upland sheep and beef farm. One of the most interesting features of the farm is its traditional landscape of small fields bounded by hedgerows. Unfortunately many of these hedges had fallen into disrepair. Furthermore, the farmer had plans to remove many of the hedges in an attempt to allow more efficient management. The Tir Cymen agreement, which was signed in 1992, provided incentives to change this situation. The hedges are now protected under the whole farm code, and are now managed for wildlife. The Tir Cymen scheme has also required a reduction of stocking on the farm's unimproved grassland. This has allowed these areas to sustain a greater diversity of plant species and associated wildlife. It is clearly evident that the Tir Cymen agreement on Tyle farm has both safeguarded and enhanced a number of fragile habitats.

Aber Hyddnant is an example of an upland livestock farm that has two threatened species within its boundaries; the otter and the brown hare. The Welsh and UK Biodiversity Action Plans for the otter and brown hare specifically state that schemes such as Tir Gofal should be used to take account of the requirements of these species. Tir Gofal does offer an opportunity to enhance the farm's environment to meet these nature conservation needs. However, the lack of funds for Tir Gofal initially meant that Aber Hyddnant application to Tir Gofal was rejected and thus the important habitats on the farm were still under threat. Furthermore, as a result of not being accepted for Tir Gofal, Mr Williams was forced to find alternative employment off the farm to supplement his income, and thus he now is forced to manage his farm on a part-time basis. It was only after extra funds were allocated to the scheme, that Aber Hyddnant's application was accepted. This case demonstrates the significant benefits that extra funding for agri-environmental scheme can bring.

Rhydlanfair is a 231 Ha upland livestock farm in Snowdonia National Park. Almost half of the farm is currently managed under existing agri-environmental agreements. This includes 150 Ha of dwarf shrub heath; which is recognised as being of international importance. In 1999, Mr Williams planned to extend the scope of environmental management on his farm by applying for entry into the Tir Gofal agri-environmental scheme. This would have generated significant income for the farm, which is currently in heavy debt. In his application, Mr Williams had proposed to enhance existing, and create new, habitats on his land. In addition to the general benefits to wildlife, the agreement also proposed to manage an area of grassland for the benefit of lapwings; a bird species listed as a high priority species by the RSPB. Unfortunately, the Tir Gofal application was rejected, and thus the opportunity to further promote wildlife on Rhydlanfair was lost.

### ***Economic analysis***

The annual budget set aside for Tir Gofal is currently set at £5.5 million, rising to £16.4 million in 2006/07.

This budget currently accounts for only 3.0 % of the total direct farm subsidies in Wales. Further funding from modulation is expected to provide an additional £18.5 million for Tir Gofal over the five-year period to 2006/07. It is predicted that these allocated funds will enable around 2,335 Tir Gofal agreements to be made on Welsh farms. It is estimated that 10,000 agreements is a realistic target uptake for Tir Gofal. This would make a significant contribution to meeting Wales' biodiversity obligations. To achieve this target, funds allocated to Tir Gofal need to be increased four-fold. This report recommends that the UK government commit these extra funds to the Tir Gofal agri-environmental scheme.

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## **An Evaluation of Public Preference for Agri-environment in Wales: A Two Stage Latent Class Analysis-Discrete Choice Modelling Approach**

**Working paper**

**By**

**Hyde AH and Christie M**

**September 2002**

The redirecting of the CAP away from production based subsidies is typified by agri-environmental programmes. Direct payment in return for the production of certain public goods is seen as an appropriate and largely acceptable response to many of the criticisms of previous policy implementations. Support funds are, in part, redirected from intense producers towards those who, largely due to conditions beyond their control, are subject to disadvantage. Payments are made, in effect, for the provision of goods valued but, critically, not purchased by the public. These include landscape, wildlife and other environmental goods, access and other non-priced leisure goods and the less tangible benefits of social and cultural well-being of rural communities.

A range of conventional economic methods have been employed to evaluate the effects of agri-environmental policy implementation based, more or less, on policy on/policy off comparisons of farm budgets, jobs created, economic 'knock-on' effects to the rural economy; in effect the observation of the results of the economic support mechanism. Less attention has been directed to the evaluation of the non-market goods paid for by that support mechanism.

A range of econometric methodologies exist for the estimation of the value of non-market goods. To date, contingent valuation method (CVM) has been most often employed. However, Choice Experiment (CE), a new and innovative method employing similar foundational theory to CVM promises substantial informational enhancements to the policy maker/resource manager. Integration of Lancasterian Theory facilitates evaluation of the separable utilities of a complex good in a single survey. This allows, for

example, the individual values of each of the several elements (attributes) of a policy to be estimated in a single, therefore consistent, format. Inclusion of several levels of each attribute in the design permits estimation of values for various levels of provision, for example landscape decline, maintenance and enhancement values. Thus various policy options, described by permutations of the attributes, may be evaluated.

Public preferences for agri-environmental implementation in Wales have been assessed using the CE method. Implementation was described in terms of landscape maintenance, farmers' welfare, access to the countryside, rural employment, and environmental quality (See Table 1). Each of these attributes have been studied at four levels: a decline in quality, the status quo, an improvement equivalent to the compulsory prescriptions in Tir Gofal, an improvement equivalent to the compulsory plus voluntary prescriptions in Tir Gofal. Marginal values for each level of attribute are obtained which may be summed to give values for a range of policy options. Summing across the levels of attributes which describe Tir Gofal indicates an average per household value for the compulsory section of the scheme of £1297 and £1375 for the compulsory and voluntary sections of the scheme (See Table 2).

**Table 1 Attributes and levels used to describe policy options in survey**

<b>Level</b>	<b>Landscape maintenance</b>	<b>Farmers welfare</b>	<b>Access</b>	<b>Rural employment</b>	<b>Environmental quality</b>
<b>Decline</b>	Removal of landscape features	Long hours worked for <60% national average wage	Legal status precludes decline	20 jobs per 100 farms	Pesticides and fertilisers used, Average 550 incidents per year
<b>Status quo</b>	Little or no maintenance, decline in quality possible	Work long hours for 60% of national average wage	75% of PROWs passable	30 jobs per 100 farms	Pesticides and fertilisers used, Average 400 incidents per year
<b>Equivalent to compulsory elements of TG</b>	Active maintenance of landscape features	Work long hours for the national average wage	100% of PROWs passable	50 jobs per 100 farms	No pesticides or fertilisers on scheme farms, agricultural incidents reduced to 200/year
<b>Equivalent to compulsory + voluntary elements of TG</b>	Enhancement through restoration & creation of features	National average hours and wages	As above + permissive access on scheme farms	70 jobs per 100 farms	Impossible to further reduce chemical use on scheme farms.

Of interest is the facility, by varying elements of the scheme, to examine the effects on value of, for

example, increasing or reducing the landscape maintenance level, or compensatory measures within the scheme, substituting landscape maintenance for environmental quality perhaps, or even the value resulting from increased provision over all aspects of a policy, in Table 2 this is the compulsory + voluntary section of the Tir Gofal scheme. The figures for the decline scenario should be considered as willingness to pay to prevent that decline.

**Table 2 Value of Program Components (Attributes)**

<b>Program</b>	<b>Landscape maintenance</b>	<b>Farmers welfare</b>	<b>Access</b>	<b>Rural employment</b>	<b>Environmental quality</b>	<b>Total</b>
<b>Decline in quality</b>	-£380	-£330		-£77	-£347	-£1135
<b>Compulsory sections of Tir Gofal</b>	£537	£239	-£65	£155	£430	£1297
<b>Compulsory and voluntary sections of Tir Gofal</b>	£491	£190	-£48	£310	£430	£1375

Within the field of valuation studies the inclusion of disparities in personal tastes and preferences, termed respondent heterogeneity, offers much of value to decision makers. The issue has been addressed in this study using a sound statistical method known as Latent Class Analysis (LCA). This allows investigation of not only what is valued but also by whom (See

The results would suggest that environmentalist obtain more benefit from Tir Gofal than those who wish to participate in active pursuits. (e.g. hiking, horse riding, mountain biking). The difference appears to be due to not only landscape and environmental preferences being addressed but also little action in Tir Gofal to provide better access opportunities of the type sought by the active access class. Little indication is given as to why the environmentalists place greater value than the active access class on improvements in farmer welfare. Table 3)

This has several implications and uses. Technical application of the estimates, in benefits transfer and interim compensatory measures, may be enhanced and, of interest to decision makers, the location of marginal effects is described. This has revealed interesting issues within agri-environmental policy implementation. Strongly divergent views on, for example, access have been revealed. By indicating who and implying why those views are held the results provide material which should be helpful in the design of conflict mitigation into the scheme.

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**Table 3 Comparison of Preferences for Components of the Tir Gofal Scheme**

<b>Latent Class Type</b>	<b>Landscape maintenance</b>	<b>Farmers welfare</b>	<b>Access</b>	<b>Rural employment</b>	<b>Environmental quality</b>	<b>Total</b>
<b>Active Access</b>	£508	£152	-£31	£158	£502	£1290
<b>Environmentalist</b>	£558	£205	£79	£154	£590	£1586

A second stage of latent class analysis has been employed in order to explore these disparities (see Table 4). For example a ‘not access preferring’ class has been examined using the same techniques to evaluate reasons for their position on access. Three attitudes, or sub classes of not access, were apparent: the ‘environmentalists’, a class against greater access provision due to the increased disturbance to wildlife it would create; the ‘socially aware’, a class who were generally positive towards access; finally the ‘not environmentalists’ are a class who appear to be negative towards public rights of way as the standard Tir Gofal level of provision but generally positive towards the additional voluntary permissive access,.

**Table 4 Value of components of the Tir Gofal scheme by sub-classes of the 'not access' class**

<b>Sub-class of not access</b>	<b>Landscape maintenance</b>	<b>Farmers Welfare</b>	<b>Access</b>	<b>Rural employment</b>	<b>Environmental quality</b>	<b>Total</b>
<b>Not environmentalist</b>	£485	£453	-£240	£139	£136	£973
<b>Socially aware</b>	£1785	£367	£251	£367	£1527	£4272
<b>Environmentalist</b>	£539	£261	-£127	£131	£452	£1258

Some questions may be directed at the relatively high values of the ‘socially aware’ class. Referring to the socio-economics of the respondents this class had high income levels, highest education levels for both respondent and spouse, high rates of employment and the highest rates of membership in conservation organisations. This was also the smallest of all the classes identified, amounting to only around 9% of the total number of respondents. The values therefore seem to be justifiable. Further confirmatory evidence is demonstrated by the environmentalist class which shows greatest value for the physical attributes of the scheme, landscape and environmental quality, but low values for the social aspects. The final class possibly see permissive access, as a voluntary condition in agri-environment attracting additional payment, and landscape maintenance as sources of income to the farmer. Coincidentally this class also demonstrate the highest values for farmers’ welfare. A relatively small proportion of respondents belong in this class who

appear to be in many ways sympathetic towards the agricultural community. The identification of this class as not access-not environmentalist may be better described as 'farmers friends': they are in effect classified by default, of not being strongly pro- either environment or access, in to advocating the scheme for reasons of supporting the agricultural community.

The classes derived through LCA are behaviour/preference based. A comparison of the socio-economics of the classes derived in this way is interesting and supports the use of this method. First, several classes are distinct only in one or two socio-economic variables, such as age or income, which would clearly be poor predictors of agri-environmental preference. Second, two classes with highly disparate preferences actually demonstrate very similar socio-economic characteristics. Finally, the LCA approach, being behaviourally based infers some explanatory power in the analysis of the observed disparities in agri-environmental preferences.

Application of the LCA-Discrete Choice approach to modelling public preference has extended the CE approach to allow heterogeneity of respondent to be expressed and quantified. The use of the two techniques, which are soundly based both in theoretical and statistical terms, has produced results which conform to the requirements of decision makers. The extension to the CE method has in no way increased the complexity and cost or reduced the response rates of conventional CE surveys. None of the theoretical benefits inferred over prior techniques have been compromised. It appears as simply an additional layer of analysis that may be used to obtain a wealth of information over and above that which would be made available in a conventional analysis. Little additional cost other than the analysis is foreseen, indicating the method to be a significant improvement in terms of informational cost efficiency.