The Drover´S Routes Within Rural Development: Cañada Real Del Reino De Valencia Case Study

INMACULADA GUAITA PRADAS

BALDOMERO SEGURA GARCÍA DEL RÍO
Universidad Politécnica de Valencia
Camino de Vera s/n, 46071 Valencia
Spain

SALVADOR DEL SAZ SALAZAR
Universidad de Valencia
Institution
Av. Tarongers s/n
46022 Valencia
Spain
iguaita@esp.upv.es
bsegrua@upvnet.upv.es
Salvador.Saz@uv.es

Abstract

The increasing demand for environmental assets for society makes environmental resources that have fallen into disuse susceptible to being attributed new values relating to the use they can be put to, not only by the inhabitants of rural areas where they are found, but also for city dwellers who can use them for leisure activities and to be in closer contact with nature.

A good example of this is that of the drover´s routes that have been used for over 500 years for animals to be moved from a to b, during a period coinciding with the growth of the food and fisheries sector in Spain. The industrial economic development process caused them to be abandoned progressively leading to a state whereby they have become irreparable in some cases. Deterioration is caused on one hand by the cease in their main use, that of the passage of animals and also by both public and private intrusive actions.

To reinstate the value if the drover´s routes, they first have to be assessed on an economic basis. To assess the value of assets that do not have any market value, such as the drover´s routes, we have to use indirect valuation methods. In this study, a contingent valuation method was used to give a value the Cañada Real del Reino de Valencia (Kingdom of Valencia Royal Drover´s Routes), specifically the stretch between Camporrobles and Buñol, based on a survey conducted on 103 people classed as potential users of the Cañada Real after a hypothetical rehabilitation project to transform it into a recreational area based on contact with nature. The project is also seen as a possible economic development instigator for the area, due to the potential tourist demand that the restoration of the Cañada Real could attract.

Key words: Cañada Real, contingent assessment, willingness to pay, rational consumer choice.
JEL Classification: O50, R00.

1 Introduction

The drover´s routes constitute extensive and natural and cultural heritage which, in spite of its deterioration is still used for the occasional passage of livestock and contributes actively to the preservation of the wild flora and fauna that could potentially play a relevant role in rural development by fomenting alternative uses such as tourist recreational activities attracting rural development resources.[3] Drover´s routes maintain strategic value with the rational exploitation of natural resources and territorial planning5.

Drover´s routes have been defined along the passage of history, in answer to the needs of

productive activity such as the movement of livestock towards markets and abattoirs, allowing movement to find new pastures locally and above all, to give support to the different modes of migratory herding. Migratory herding is a means of adapting to the environment in which we find ourselves and to the complementary nature from the point of view of the vegetative cycles offered in a given territory.

Firstly, in the Valencian Community we find vertical migratory herding both on a rising and a falling scale, the latter being the more frequent and both offering various possibilities as regards the actual position of summer and winter pastures. Winter grazing areas are concentrated on the coastal and pre-coastal planes and some foothills across the whole Valencian area. The complementary rain fed pastures are primarily in the Gúdar, Javalambre, Albarracín and Cuenca mountain ranges.

Valencian drover´s routes were first trod throughout the Middle Ages and then Modern Age in response to the various types of livestock movement which take place in the territory. In this way and although their function was above all migratory, herding itineraries were also established in relation to public sales (markets and abattoirs) and local inter-pasture movement.

The economic, social and cultural importance of migratory herding throughout the passage of time are undeniable, from the beginning of the Contemporary Age shows a rapid decline due to the reduced use of the drover´s routes which are suffering a growing problem of intrusion. Technological advances in the production of produce and in the transport infrastructures have encouraged the gradual abandoning of the long distance country drover´s routes in favour of rail and road transport.

Since the end of the last decade and in a sense of environmental sensitizing, the drover´s routes have been the object of continuous revaluing from different perspectives such as natural and cultural.8 Cultural and socio-economic development in Spanish society have enlivened the demand for environmental resources to be used as recreational facilities and encourage contact with nature. In this way the drover´s routes in question gain added economic value thanks to the increased use by society if they are in a usable condition.

The pathways interconnect rural and urban areas with different levels of economic development in much the same way as they did when being used for their original purpose; that is to say the passage of livestock in search of pastures or on their way to market or the abattoir. The developed areas, usually the urban and coastal areas in the Valencia area mark a sharp contrast with the inland areas which are less developed and immersed in principally rural activity and whose economies are based on agriculture and "secano", the cultivation of crops in dry areas or dry farming. In an attempt to give impetus to the economic activity of these less developed areas, the drover´s routes can be used as an important element in the country planning strategy, providing cultural areas and contact with nature, as well as satisfying the growing demand for cultural and natural spaces at the same time as satisfying the demand for environmental resources.

In this way the Public Administration plays an important role coordination of rural development policies and the desires of society. To improve the planning process we have to use means to improve the efficiency of budgeting resources and one of these is pre-valuation of environmental resources. For this reason we propose this study to evaluate the drover´s routes as the basis for public expense policy, to determine the value of its use and for what it could be used as the base for limited public resources/ in the field of rural development policy. The stretch from Camporrobles to Buñol of the Cañada Real del Reino de Valencia has been chosen to be evaluated by the Contingent Valuation Method.

The drover´s route in question is number 9 in the Meseta (plateau) documentation and the Camporrobles to Buñol stretch joins two areas of quite different development and is thus a good example of the strategy for territorial planning.

The evaluation method chosen (CVM) is guaranteed by the National Oceanic and Armospheric Administration in a report made by the commission presided over by two winners of the Nobel Prize for economics. Kenneth Arrow and Robert Solow 22. It has also been proven in the course of various studies of public property and environmental resources which add credit to its validity.

In this publication results of a survey on 103 potential users of the area are reported, as a pre-in-depth evaluation of a sample of 700 individuals.

2 Methodology

The CVM is used extensively to evaluate property which has no market value, such as environmental resources and public property and to evaluate the environmental impact of variations in the environmental conditions using the cost-profit analysis.[1]

The contingent evaluation method has its analytic base in the theory of the rational choice of the consumer, i.e., it is supposed that individuals make consumer decisions to maximise their level of well-being.[10]. Following in the footsteps of Branden, Kolstad y Miltz[13] we suppose that *q* represents the value of an element of environmental property, *v* the quality of the same, *Y* the disposable income of the individual and finally, *x* is the amount of a piece of property composed of private elements. In the same way, p is the price of the environmental property and the price of the composed element is the unit. It is also the supposition that p is the normalised price in respect of the private assets. So, the individual tries to maximise the following function of utility: (l)

$$\max_{q,x} \mathrm{u}(\mathrm{q}, \mathrm{x}; \mathrm{v}) \quad (1)$$
$$\text{s.a. } pq + x \le Y$$
$$q, x \ge 0$$

From a theoretical point of view, the correct measurement of change in well-being is the payment to which he would be indifferent if or not there was a change in the quality or the quality of the environmental asset. We suppose that the consumer uses all his income. So for a certain level of Y and of v the latter results in the equation (1) obtained a certain level of usefulness, u* and an optimum consumer basket (q*(p. Y.v), x*(p,Y,v)) in function of p and v. Through the total differentiation in function in the utility of the optimum values [u = u*(q*(p.Y,v), x*(p,Y,v)] and the budget restriction [Y= pq*+ x*] we obtain the following expressions:

$$d\mathrm{u} = \frac{\partial \mathrm{u}}{\partial \mathrm{q}} \mathrm{dq} + \frac{\partial \mathrm{u}}{\partial \mathrm{v}} dv + \frac{\partial \mathrm{u}}{\partial \mathrm{x}} dx \quad (2)$$

$$dY = qdp + p\mathrm{dq} + dx \quad (3)$$

If we try to see how the changes in the variables q and v can be compensated for changes in the variable Y, so we would have du=0, from here as this term disappears from the equation (3). If we rearrange the equations above we find:

$$-d\mathrm{x} = \frac{\partial \mathrm{u}/\partial \mathrm{q}}{\partial \mathrm{u}/\partial \mathrm{x}} \mathrm{dq} + \frac{\partial \mathrm{u}/\partial \mathrm{v}}{\partial u / \partial \mathrm{x}} dv \quad (4)$$

$$-dx = pdq + dY \quad (5)$$

If we now suppose that V is the attribute for which we contemplate the change, so, equalising the right hand side of the equations we would have to:

$$\frac{\partial u/\partial q}{\partial u/\partial x} dq + \frac{\partial u/\partial v}{\partial u/\partial x} dv - pdq = dY \quad (6)$$

This equation shows us that the payment that any individual must make (dY) is equal to the difference between the value allowed by the change in quantity and quality of the environmental asset (the first two terms in the left hand side of the equation) and the change in the expense incurred in q (the last term on the left).

A fundamental condition in consumer theory is that the individuals when they try to maximise their well-being, equal their marginal substitution relations with the product price list. So, in our set of examples we would have to:

$$\frac{\partial u/\partial q}{\partial u/\partial x} = p \quad (7)$$

Now, substituting (7) in (6) we would get the following equality:

$$\frac{\partial u/\partial v}{\partial u/\partial x} = -\frac{dY}{dv} \quad (8)$$

This expression indicates that the marginal substitution relation ship between the environmental asset (v) and the private one (x) must be the same as the change in the income of the individual (what he s willing to pay) and would maintain his level of constant usefulness as and when *v* changes. So, if the change in quality is positive, then the individual would be willing to reduce his income to maintain the constant and vice versa if it is negative. From this, the substitution margin coincides with the monetary evaluation which would leave the individual indifferent or not to the environmental change.

From the indirect usage functions or the expense functions it is possible to define the compensatory variation equivalent to a change in the quality of environmental well-being. These concepts are considered as theoretically correct with regard to well-being as they define the variation in income an individual would be indifferent to whether or not the said quality change occurs.

The contingent valuation method attempts to measure directly the said concepts by way of the design of a questionnaire in which the individual states his intention to pay (or receive compensation, depending on the case) if there is a change in the environmental conditions. Here the relevant question is to find out if this is the right method or not to provide an exact evaluation of the public and environmental assets which cannot be evaluated with reference to a direct market. However, it is this very lack of market that, in practice, prevents us from proving the value of the method and so we do not know the actual value individuals give and so we cannot compare it with the estimates obtained. So in general, the strategy followed to obtain a correct valuation is to design a scenario which minimises the appearance of bias or prejudice and at the same time we can often compare the results obtained with those obtained using alternative methods. According to Mitchell y Carson[12], Azqueta[14] y Riera[15], the said biases are usually of four main types: the possible strategic behaviour of the individuals, those due to a poor description of the hypothetical market, those due to the information given and lastly, those created in the process of being shown the idea and adding them.

3 Data and analysis

To apply the CVM we have to get the individual willingness to pay (the DAP) to improve environmental well-being or the willingness to be compensated (DAC) for the loss of an environmental asset. In this case the asset was the stretch of the Cañada Real del Reino de Valencia from Camporrobles to Buñol. The relevant population was chosen a men and women over 18 and who live in towns and villages on the trail route and those who live in

areas that could hold the Cañada as a recreational attraction. The sample was chosen at random form the city of Valencia and municipal area in and around and thus having direct contact with the Cañada in question.

Interviews took place between April and May 2009. Following the recommendations of Bateman[2] and Carson[11] the questionnaire was structured in three parts. In the first, the individual is introduced to the evaluation scenario and the importance of the drover´s routes from an environmental point of view is pointed-out, then other alternative uses allowed by Law 3/95 which regulates and protects their contribution to economic development in the areas they pass through are explained as well as what a restoration of the Cañada Real del Reino de Valencia would imply in these terms. This explanation was accompanied by some pictures showing two scenarios: one with the trail ready for use for leisure activities (walking, horse riding etc.,) and the other showing public intrusion in the form of private walls or fencing and public roads and thus made useless from the point of view of enjoyment of nature and contact with nature.

The second part of the questionnaire refers to the actual simulation of the hypothetical market. We start with a question with reference to the willingness to pay and as it is a pilot questionnaire with a view to making a fuller survey, the questionnaire is divided into two, in the first group, a closed question is posed, about the willingness to pay 20€ a year for the first 4 years of the project; the second group an open question is posed with regard to how much the individual would be prepared to pay so that a public investment project to restore the Cañada Real del Reino de Valencia can be made during the 4 years foreseen to implement it. We chose to make the payment via and increase in the rates,; as the Public Administration would collect the money and the Council for the Environment who would have jurisdiction over the drover´s routes so it would be the latter who would be in charge of supervising and implementing the public investment project for the renewed use of the Cañada Real del Reino de Valencia. The questionnaire was divided into parts to try to find the best way of getting the information as there is as yet no common advice on this point in economic literature. While Hanemann[16] indicates that a dichotomous format eradicates a lot of the biases that appear if the question is asked in an open way, other authors, such as Freeman[17] or Schulze[18] affirm that the open format gives more exact estimations, as in the dichotomous format results can be biased on the upper side as the individual is being given information biasing his valuation of the object of the study[19]. We can observe that using the simple dichotomous form there are fewer answers of the type: "protest" and "does not know" and the values are less erratic than with the open format [20, 21]. This format is also recommended in the commission's report on contingent valuation from the *National Oceanic and Armospheric Administration 22.* The dichotomous question was with a sum of 20€ which was found by basing the calculation on a study done by the Official Guild of Agricultural Engineers on the Royal Trail of Castilla between Sinarcas and Llombay and bearing in mind that by choosing to have the payment made via the rates, every household in Valencia and the province of Valencia would be contributing.

The third part of the questionnaire collects information relevant to the socio-economic characteristics of the people interviewed so the value can be assigned to the willingness to pay (DAP) stated and explained by the variables. The relationship between the personal information and the willingness to pay (DAP) shown by the individuals interviewed has been analysed in the contingency tables. The DAP has been estimated using a logit model (table 1). Some of the US Administrations and even the commission for the *National Oceanic and Armorspheric Administration* itself suggest the use of the willingness to pay formula.

4 Resultados

Of the 103 people interviewed, 53% stated a willingness to pay for a public investment in

the Cañada Real del Reino de Valencia by way of an increase in the rates during the 4 years the project would take. Of the interviewees who were not willing to pay, 68% gave answers with a protest in that they did not trust the Public Administration to manage the budget; 6% thought the Government should pay for the upkeep of the drover´s routes and 16% said they were not interested. These results show the limited credibility the Public administration enjoys when it comes to public investment dealing with nature and the environment.

The relationship between the personal information provided and the willingness to pay (DAP) stated, was analysed in the contingency tables and the most relevant socio-economic variable was the household income. The estimated logit model is shown in table 1.

Parameter	Estimated	S.E.	t	p
Constant	-3,641	1,153	-3156	0.0016
Disposable income	0.587	0.189	3,096	0.0020

Table 1: Relation between the DAP and the disposable income via the logit model.

51% of the interviewees were men and 49% were women. The men were less open to the idea of paying than the women, representing 43% as against 51% of the women. The age of the individuals is shown in table 2, and we can see an larger DAP in individuals between 31 and 45 years of age, although age groups showing greater DAP in relative terms are the youngest, from 18 to 30 years of age (63.64%) and the oldest, over 60s (53.85%).

Age	Total %	DAP%	No DAP%
18-30	11	7 (63.64%)	4 (36.36%)
31-45	51	26 (50.98%)	28 (49.02%)
46-60	25	11 (44.00%)	14 (56.00%)
>60	13	7 (53.85%)	3 (46.15%)
Total	100	51 (51.00%)	49 (49.00%)

Table 2 Ages of those interviewed with DAP

In table 3, we can see the total household income in relation to the DAP, most of the interviewees enjoying a middle-range income, and as expected, as foreseen in the economic theory and the logit model applied, the higher the income the higher the DAP, as shown by the willingness to pay on behalf of those with a greater income. In the same way, those with a lower income are less predisposed to pay.

Income level	Interviewed	DAP (%)	No DAP (%)
From 500€ to 1,500€ per month	9	4 (44.44%)	5 (55.56%)
From 1,501 to 2,500€ per month	39	12 (30.77%)	27 (69.23%)
From 2,501 to 3,500€ per month	26	8 (30.77%)	18 (69.23%)
From 3,501 to 4,500€ per month	19	18 (94.74%)	1 (5.26%)
Over 4,500€ per month	7	7 (100.00%)	0 (0.00%)

Table 3 Income of interviewees and their relationship with the DAP.

5 Conclusions

The MVC can be very useful to us to find out the preferences of social groups and to manoeuvre a public investment policy in accordance with the resulting preferences. Society presents a growing demand for leisure services related to natural resources and the environment as shown by the evaluation obtained in the study of the Cañada Real (Royal drove road) del Reino de Valencia. In the hypothetical market proposed in the questionnaire, the individuals are ready to accept an additional taxation to be included in their rates, for a public investment project which will allow the Cañada Real del Reino de Valencia to be used for leisure and the enjoyment of nature because the consumer will receive an improved feeling of well-being.

As well as demonstrating the Cañada Real's real value, it will help to connect the development of urban areas where a better level of income is enjoyed and the rural areas which have a better feeling of well-being or quality of life.

The study already made is within the framework of a larger study in so far as the number of people surveyed is concerned which will give us more complete results although the sample given does give coherent conclusions in line with the economy and economic theory; this leads us to believe that a continued study will be beneficial in the evaluation of environmental assets and those of the Cañada Real del Reino de Valencia and we will be able to collaborate with the decision-making process for the public with the wishes of the society at heart.

References

[1] E. Araña Jorge and J. León Carmelo, "Actualización de las preferencias en procesos iterativos de valoración contingente", *[Updating of preferences in iterative processes of contingent evaluation]*Madrid Hacienda Pública Española. Revista de Economía Pública, [*Public Economics Magazine]* 177 (2/2006), pp83-105.

[2] I. J. Bateman. and others, *Economic valuation with stated preference techniques*, Massachusetts, Edward Elgar Publishing, (2002).

[3] A. Cazorla Montero, J. L. Alier Gándaras, I. De Los Ríos Carminao and J. Merino García, "Modelo de clasificación y valoración multifuncional de una red de vías pecuarias: aplicación a dos subcomarcas madrileñas", [*Multifunctional classification and evaluation of a network of drover´s routes: applied to two sub-boroughs of Madrid]* Estudios Geográficos, nº LXV, pp 255-295, (2004).

[4] S. Del Saz Salazar, "Valoración económica de espacios naturales: un fenómeno reciente", [*Economic evaluation of natural open areas: a recent phenomena]* Segundas Conferencias sobre Medio Ambiente, Turismo y Medio Ambiente, Castellón, (1999). [*Second conference on the Environment, tourism, and the Environment, Castellón]*

[5] A. P. Espluga González De La Peña, E. González Algarra and A. Arnalich Castañeda, "Vías pecuarias: conservación y nuevos usos", [*Drover´s routes: conservation and new uses*] Observatorio Medioambiental, nº 2, pp 81-104, (1999).

[6] J. A. Gómez Limón and J. Barreiro-Hurlé, "Valoración de bienes ambientales complejos:

una alternativa multicriterio", [*Evaluation of complex environmental assets: a multi-criteria alternative*] Economía Agraria y Recursos Naturales, vol 7, 14 pp 83-107, (2007).

[7] M. González Gómez and X. M. González Martínez, "Eficiencia en la intervención pública medioambiental Aplicación a un parque natural", Valencia. [*Efficiency in public intervention of environmental issues: application to a natural park, Valencia]*. Revista Valenciana de Hacienda Pública. [*Valencian Tax Authority Magazine*] Vol. 33, nº 18, pp 73-94 (2004).

[8] J. Merino García and J.L. Alier Gándaras, "La multifuncionalidad de las vías pecuarias españolas en el marco de desarrollo rural", [*Multi functionality of Spanish drover´s routes in Rural development*] Madrid, Revista de Ciencia Tecnología y Medio Ambiente, vol. II, (2004).

[9] I. Otero Pastor, E. González Algarra and E. Moreno Cuesta, "Evaluación de la capacidad de acogida de nuevos usos por una vía pecuaria mediante el desarrollo de un modelo. Aplicación práctica", [*Evaluation of the acceptance capacity of new uses for a livestock path by the use of a model]* Madrid, Informes de la Construcción, vol. 53, nº 467, pp 53-72 (2001).

[10] L. Venkatachalam, "The contingent valuation method: a review", Environmental Impact Assessment Reviews 24 89-124, (2004).

[11] R. T. Carson, N.E. Flores, K. M. Martin and J. L. Wright, "Contingent Valuation and revealed preference methodologies: comparing the estimates for quasi-public goods", Land Economics, 72, 80-89, (1996).

[12] R.C. Mitchell and R. T. Carson, *Using surveys to value public goods: The Contingent Valuation Method, Resources for the future*, Washington, D.C. (1989)

[13] J. B. Braden, C. D. Kolstad and D. Miltz, *Theory and methods*, en J. B. Braden y C. D. Kolstad (Eds.), *Measuring the demand for environmental quality*, North Holland (1991).

[14] D. Azqueta, *Valoración económica de la calidad ambiental*, Edit. McGraw-Hill, Madrid (1994).

[15] P. Riera, *Manual de valoración contingente*, [*Manual of Contingent Evaluation*] Instituto de Estudios Fiscales, Madrid (1994).

[16] W. M. Hanemann, "Valuing the environment through contingent valuation" J. *Econ. Persa*, **8**, 19-43 (1994).

[17] M. Freeman, "The measurement of environmental and resource values, Theory and Methods" Caps. 4 y 11, *Resources for the future*, Washington D.C., USA, (1992).

[18] W. Schulze, "Embedding effects en the contingent valuation of public goods*", Resource Energy Econ*. **23**, 149-173, (1993).

[19] W. Schulze, R. D. Rowe and W. Breffle, "A test for payment card biases*", Journal Environmental Economic Management*, **313,** 178-185, (1996).

[20] W. M. Hanemann, "Welfare evaluations in contingent valuation experiments with discrete responses", *Am. J. Agric. Econ*. **67**, 332-340, 1984).

[21] T. Cameron, "A new paradigm for valuing non market goods using referendum data: maximum likelihood estimation by censored logistic" *Journal Environmental Economic Management,* **15**, 335-379, (1988).

[22] K. Arrow, P. R. Solow, E. E. Portney, R. Leamer, H. Radner and H. Schuman, "Report of the NOAA panel on contingent valuation" *Fed. Reg.,* **18**, 4601-4614, (1993).

[23] J. Klein, *The Mesta: A study in Spanish Economic History 1273-1836*, History o Economic Thought Books, McMaster University Archive, (1920).

"La traducción/de este trabajo ha sido financiada por la Universidad Politécnica de Valencia."
"The translation of this paper was funded by the Universidad Politécnica de Valencia, Spain."