TRENDS IN COMMUNITY SUPPORT FOR SOIL CONSERVATION

T.P. Yapp, L.J. Young and J.A. Sinden

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ABSTRACT

During the 1980s there were a number of important developments in soil conservation policy and legislation at both state and federal level, including significant increases in government funding, which are briefly reviewed in this paper. Given these developments, the tight economic climate at the beginning of the 1990s and the fact that soil conservation is largely perceived as a rural problem, it is of particular interest to examine the level of support for soil conservation amongst households in Australia's largest city.

This paper reports the results of a telephone survey of 150 Sydney households conducted in March-April 1990. The survey was conducted amongst three groups of suburbs selected as representative of high, middle and lower income areas.

The survey sought two kinds of information on the level of community support for soil conservation. First, information about preferences for the targeting of additional government expenditure between alternative conservation issues. Second, information about the willingness of respondents to pay extra directly from their own resources in support of soil conservation. The results are contrasted with those reported by Sinden (1987) and Dragovich (1990). Both the survey reported here and Dragovich's 1989 survey were based on Sinden's original research conducted in 1985.

Respondents were initially offered the same selection of options offered by Sinden in 1985 (including the option of a tax rebate). Stopping soil erosion was nominated as the preferred target for additional government expenditure by 32 per cent of respondents in 1990 compared with 38 per cent in 1985. Prevention of beach pollution was not amongst the options offered by Sinden, but was included in a second set of options in the present survey and in Dragovich's survey. In both cases beach pollution was nominated as the preferred target for additional government expenditure by over 50 per cent of respondents while less than 20 per cent nominated soil conservation.

However, despite gloomy economic circumstances and despite a stronger expression of support for government expenditure on issues other than soil conservation, the willingness of respondents to pay extra directly from their own pockets to support soil conservation has increased significantly in real terms since 1985. Possible reasons for, and policy implications of, the observed results are discussed in the paper.

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T.P. Yapp[1], L.J. Young and J.A. Sinden[2].

INTRODUCTION

Judged against the observed level of media and political interest in a range of conservation issues, Sinden (1987) found the level of community support for soil conservation in 1985 was much higher than expected. In a series of surveys support for soil conservation was found to be widespread in all sectors of the community (rich and poor, city and country, migrant and non-migrant). Survey respondents ranked soil conservation above the preservation of kangaroos or rainforests as their preferred target for additional government expenditure. Sinden also calculated that each household in New South Wales would, on average, be willing to pay an extra $15 per year as a surcharge on the price of bread so long as the funds so raised - equivalent to about $26m for the state as a whole - were applied to soil conservation.

As a consequence of the increasing politicisation of environmental issues and changed economic circumstances since 1985, it might be expected that some change in the level of community support and willingness to pay for soil conservation could be observed. Publicity about pollution of Sydney's beaches and the controversy over logging of the South-East forests might also be expected to have had some impact on the ranking of soil conservation relative to other environmental issues in the concerns of the population at large.

To test whether in fact there have been significant changes in the level of community support for soil conservation since 1985, a small follow-up survey modelled on Sinden's 1985 questionnaire was conducted early in 1990. The results of that survey are reported in this paper, but first a brief overview of the policy context is presented.

PUBLIC POLICY AND COMMUNITY COMMITMENT

In the last ten years there has been major growth in the commitment of public funds to the battle against land degradation. For example, from humble beginnings in 1983 the budget of the National Soil Conservation Program has grown from $0.6 million in 1983-84 to $22.3 million in 1990-91 with a further $8.5 million budgeted for the new Land and Water Resources Research Corporation.

In a major statement titled "Our Country Our Future", the Prime Minister in 1989 declared the years 1990 to 2000 as "the Decade of Landcare". High profile and costly commitments with significant implications for soil conservation and land management generally have also been made through initiatives such as the Natural Resource Management Strategy for the Murray-Darling Basin, the One Billion Trees Program and the Save the Bush Program. Soil conservation has

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[1]. Soil Conservation Service of New South Wales.

[2]. University of New England.

been, or will be, a major consideration in other government initiatives such as the recent work of the Drought Policy Review Task Force and the recently formed Working Groups on Sustainable Development.

Other important initiatives in recent years include formation of the Australian Soil Conservation Council in 1986 and preparation of the National Soil Conservation Strategy. Section 75D of the Taxation Act, which provides concessional treatment for expenditure to prevent or combat land degradation, has had its provisions broadened over a number of years to include a greater range of land degradation problems and to increase the range of taxpayers eligible to benefit from its concessions.

At the state level, funding for soil conservation by the Government of New South Wales has been maintained over a period in which considerable pressure has been exerted on many areas of government expenditure. A Total Catchment Management Policy (incorporating the State Soils Policy) was released in 1987. In March 1990 the Statecare program was launched with an annual budget allocation of $500 million. At the same time a new Catchment Management Act became effective.

Evidence of increased commitment to soil conservation and related issues is not restricted to governments alone. A great many landholders and other interested individuals have become involved in community based attempts to tackle land degradation. Since the first groups under the Dunecare banner were formed in 1987, membership has grown to some 3000 people in 150 Dunecare and Landcare groups addressing land management issues ranging from dryland salinity to beach dune protection.

METHOD

The Questionnaire

The 1990 questionnaire (Annex 1) was modelled on the questionnaire applied by Sinden in 1985. The survey was conducted by telephone using a single interviewer over a three week period in late March and early April 1990. Telephone interviews were selected for reasons of comparability and timeliness. The questionnaire was short and straightforward enough to lend itself to this method. As with the previous survey the interviewer introduced the sponsor of the survey as the University of New England. To avoid any possibility of "compliance bias" the involvement of the Soil Conservation Service in the survey was not revealed to respondents. The interviewer had no prior connection with either of these organisations.

The timing of the survey was unfortunate in that a Federal election was held on 24 March 1990. This is thought to have contributed to initial difficulties in obtaining a satisfactory response rate. Some contacts claimed it was the third or fourth survey they had been asked to answer that day and many people expressed unwillingness to participate in a survey which had anything to do with government. Initially the preamble included reference to "a survey... about government expenditure". Much improved cooperation was obtained when

this reference was replaced with the simple request "Can I ask you a few quick questions please?". An overall response rate of 72 per cent was achieved for the survey - (150 interviews from 208 answered phone calls).

Question 1 was unchanged from that asked in 1985 except that money values referred to in the question were updated to account for inflation and changes in the number of households since 1985. The amount og additional government expenditure was raised from $17 million to $45 million representing approximately $15 and $20 per household respectively. Question 2 was added to give respondents the opportunity of ranking soil conservation against two current high profile environmental issues - beach pollution and forestry management. Question 3 was expanded, again because of inflation since 1985, to include the option of paying an extra 20 cents per loaf of bread, the standard price of which had risen from $1.00 to $1.40 over the five year period.

The order in which the options for questions 1 and 2 were presented was randomised to ensure that the order had no effect on the outcome.

The Sample

The survey was conducted amongst three of the groups surveyed by Sinden in 1985. These were the Sydney suburbs of Hunters Hill, Manly and Mosman (representative of high income suburbs); Baulkham Hills, Cronulla and Strathfield (for middle incomes); and Bankstown, Blacktown and Leichhardt (for low incomes). These suburbs were originally selected by Sinden following a stratified random sampling procedure based on the distribution of household incomes reported in the 1981 Census. It has been assumed that there have been no significant socio-economic or demographic changes within or between these suburbs since 1985.

In each group, households were selected at random from the telephone directory until 50 successful calls were made to each group. The total of 150 calls were spread over weekdays and weekends at various times of the day.

RESULTS AND DISCUSSION

The results of the survey are set out in Table 1. Comparable results reported by Sinden (1987) and Dragovich (1990) are shown in Tables 2 and 3 respectively. The survey conducted independently by Dragovich was also based on Sinden's original questionnaire, but the authors of the present paper were unaware of this work until some time after the survey reported here was undertaken.

Question 1

In question 1 respondents were asked to state their preference between soil erosion and the same three alternatives which were offered in 1985 as the target of a significant increase in government

expenditure. In 1990 some 32 per cent of the sample nominated soil erosion as compared with 38 per cent in 1985. Similarly, there was a reduction in the percentage of respondents opting for a tax refund (down from 25 to 17 per cent), or protection of rare kangaroos (down from 10 to 7 per cent). The expressed preference for the additional expenditure to be directed to the preservation of rainforest species was up from 27 per cent in 1985 to 43 per cent in 1990.

Respondents were not asked to explain their choices but it is interesting to speculate on what underlying reasons there may be for the observed changes.

First, the higher preference in 1990 for additional expenditure to be directed to the preservation of rainforest species may be due in part to the fact that, as Sinden (1987, p190) indicates, the New South Wales government spent some $32m in 1984 and 1985 to buy private production forest to provide logs and jobs 'lost' when rainforests were preserved. This expenditure may have been fresh in the minds of respondents to the 1985 survey, so there may have been a general feeling that additional expenditure was not required at that time. It may also be due to respondents identifying with the word "forest" rather than with "rainforest species" in particular. The results of question 2 lend some support to this interpretation.

Second, changes in tax scales have brought significant reductions in upper marginal tax rates since 1985, and this may account for the lower preference expressed in 1990 for getting a tax refund. It is noteworthy that non-taxpayers, including many pensioners, effectively were faced with only three rather than four options in this question.

Third, the protection of kangaroos was a relatively 'quiet' issue at the time of the 1990 survey compared with 1985. A number of respondents volunteered that they thought kangaroos were a nuisance.

Finally, the reduced preference for soil conservation may be attributable to public recognition of policy developments including large injections of government funds to address land degradation problems since 1985.

Question 2

In Question 2 respondents were asked to state whether they would prefer additional government expenditure to be directed toward stopping soil erosion, prevention of beach pollution or expanding the area of plantation forest. This question was included to assess the community's attitude to additional funding for soil conservation relative to two other environmental issues having a high media 'profile' at the time of the survey.

Some 62 per cent of respondents selected beach pollution to receive the nominated additional expenditure. This is not surprising given the very high levels of publicity given to beach pollution problems in the period immediately prior to the survey, and also given that the survey included beachside suburbs in the upper and middle income groups. A further 21 per cent of respondents selected the forestry plantation option and 17 per cent selected soil conservation. The

relative ranking of these two options is similar to that between rainforest preservation and soil conservation in Question 1.

Dragovich (1990) offered respondents the choice of having an extra $20 million ($11 per household) allocated to preserving rainforest, stopping soil erosion, preventing beach pollution or returned as a tax rebate. Although the question was structured slightly differently to our question two the similarity of the results is striking, particularly when the difference in survey methodology is also considered. Dragovich's survey was conducted by university students throughout Sydney using personal interviews.

Identical proportions (21 percent) of respondents in each survey nominated the "forest" option. Although the options were somewhat different this may imply that people responded to the generic "forests" rather than distinguishing between preserving rainforest and expanding plantation forests.

Very similar proportions of respondents (17 percent and 19 percent) nominated the soil erosion option. Dragovich found the proportion of people nominating this option did not vary greatly regardless of their proximity to the ocean.

The higher proportion nominating the beach pollution option in our survey (62 as against 53 percent) is almost offset by the 7 percent of Dragovich's sample opting for a tax rebate -- an option not presented in our second question. While Dragovich found some differences in the proportion of respondents selecting the beach pollution option depending on their proximity to the ocean, the differences were not monotonically or obviously related to distance from the ocean. Dragovich suggests they may be explained by the clustering of respondents at a certain distance into particular socioeconomic groups.

Question 3

Question 3 was asked to establish how much extra money respondents would in fact be willing to pay to stop soil erosion. Willingness to pay was tied to the cost of a familiar item of household expenditure with a natural link to the object of interest - in this case a loaf of bread made from wheat grown on eroding soils. This was done to minimise the risk of "hypothetical bias" and obtain more reliable responses than possible from an abstract simple open-ended question unrelated to a familiar "payment vehicle". Even so, respondents found this question the most difficult to answer and it brought forth the most animated responses. While a very few respondents said they could not answer the question because they did not eat bread, typical comments included

- lack of trust that the government would in fact spend the money as promised on soil conservation,

- reference to the inability of the "average Australian" to pay more for staple goods, and

- an expressed willingness by some respondents to pay more than indicated "if they could afford to".

On balance, comments made by respondents indicate that they were able to understand the scenario and were prepared to give truthful, considered answers. The growing literature on tests of the contingent valuation method has generally failed to reveal any systematic bias due to strategic behaviour or the hypothetical nature of the valuation method where surveys have been carefully designed and executed (Wilkes 1990; Mitchell and Carson 1989).

More than 90 per cent of respondents indicated they would be prepared to pay an extra 5 cents for a loaf of bread which currently costs $1.40, if they were assured that the extra 5c would be spent to control soil erosion. More than a third of respondents would be prepared to pay an extra 20 cents per loaf. The mean extra willingness to pay for the whole sample is 20.6 cents per loaf. The distribution of maximum bids is shown in Figure 1. The median extra willingness to pay is 10 cents per loaf and the mode is 5 cents per loaf.

For a household that consumes three loaves per week payment of the average maximum willingness to pay would be equivalent to $32 per year. Based on 1986 census figures there were an estimated 1.92m households in New South Wales at the time of the survey. On this basis, the total extra willingness to pay for soil conservation is in the order of $61.4m.

The sum of $61.4m may be put in perspective as follows. The bulk of government expenditure on soil conservation in New South Wales is channelled through the Soil Conservation Service of New South Wales. Total expenditure of the Consolidated Fund and Special Deposits Accounts for 1988-89 totalled $32m, so a payment of only half that estimated as the community's extra willingness to pay would represent a doubling of the Service's expenditure of funds from state government sources.

STATISTICAL COMPARISONS

The estimated mean willingness to pay rose from 9.5 cents in 1985 to 20.6 cents in 1990. To determine whether this increase is statistically significant in real terms the willingness to pay bids from 1985 were inflated to 1985 dollars and a two-tailed test for the difference between two means was performed (see Annex 2).

This test showed that there is indeed a real difference between the two estimated means at better than the 2 percent confidence level.

Similar tests were performed to test for differences between the estimated mean willingness to pay for each income group. The test was performed for both the 1985 and 1990 samples. In 1990 the only significant difference at the 10 percent confidence level was between the middle and high income groups. In 1985 there was also a significant difference between the low and high income groups.

CONCLUSIONS AND QUALIFICATIONS

The most general conclusion which can be drawn from the survey is that it provides strong evidence of continuing high levels of community support for soil conservation. The estimated willingness to make additional contributions toward soil conservation from the household budget shows a real increase which is highly significant (in the statistical sense). This is despite the questions being asked at a time when the general economic outlook was somewhat gloomy and high interest rates were squeezing discretionary household expenditure. This conclusion is supported by the results obtained by Dragovich some 12 months earlier.

Although the survey was conducted amongst only three of the many groups surveyed by Sinden in 1985, the results obtained from these groups in 1985 were broadly consistent with, and representative of, the results from many other groups. There is no apparent reason to expect the surveyed groups to be any less representative of the NSW population as a whole in 1990.

There are a number of possible sources of bias in a survey such as this where respondents are asked to place a monetary value on something contingent upon a hypothetical situation. The original (1985) questionnaire was subjected by Sinden to a number of applications designed to test the reliability of the results. He concluded that there was no significant tendency for respondents to either understate or overstate their true willingness to pay. Effort was taken in the design and conduct of the survey to minimise the likelihood of obtaining biased results.

The estimated real increase in individuals' willingness to pay for soil conservation was obtained at the same time as soil conservation 'slipped' in its ranking against contemporary (competing) environmental concerns as indicated by stated preferences for the target of additional government expenditure. This may be given either a 'positive' or 'negative' interpretation.
On one hand the survey did not test the willingness to pay for measures to alleviate other environmental concerns, so it is not possible to state whether the relative ranking of issues in terms of additional government expenditure (from unspecified sources of funds) would carry over into a similar ranking in the magnitude of individuals' expressed willingness to pay. However, the fact that individuals are willing to make explicit personal payments of a significant magnitude towards soil conservation may augur well for that cause -- more so than if it ranked higher on the list of environmental concerns but with little evidence of personal commitment.

On the other hand, soil conservation is not an activity which can be directly undertaken by the majority of metropolitan householders, but rather is one which relies primarily on action by landholders and government. It follows that an expressed willingness to pay may not amount to much in the absence of an organised framework by which payment can be collected and applied. This would almost certainly

require government action in collection and distribution of the funds. In the absence of strong public pressure, the government may not be as keen to confront any potential political difficulties such a course may entail as it would if soil conservation was clearly an environmental issue of the highest public conern. By way of illustration the NSW Government's introduction of an $80 surcharge on water rates, earmarked for anti-pollution measures by the Water Board, was achieved with minimal backlash because of the very high level of public demand for government action on this issue (as evidenced by the survey reported in this paper).

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TABLE 1: RELATIVE IMPORTANCE AND COMPARATIVE VALUE OF SOIL CONSERVATION : SYDNEY SUBURBS : 1990

Income Group		High	Middle	Low	Total
No. of responses		50	50	50	150
Question 1 Preferences for an extra $45m government expenditure (about $20 per household) to...					
Preserve rainforest species	%	52	38	40	43
Get $20 back on tax	%	6	22	24	17
Stop soil erosion	%	36	32	28	32
Preserve rare kangaroo species	%	6	8	8	7
Total	%	100	100	100	100
Question 2 Preferences for extra government expenditure to...					
Stop soil erosion	%	22	8	20	17
Prevent pollution of NSW beaches	%	56	78	52	62
Expand forestry plantations	%	22	14	28	21
Total	%	100	100	100	100
Question 3 Willingness to pay for control of soil erosion...					
Cents extra per $1.40 loaf of bread					
zero	%	6	10	10	9
at least 5 cents extra	%	94	90	90	91
at least 10 cents extra	%	72	56	56	61
at least 15 cents extra	%	54	26	36	39
at least 20 cents extra	%	44	26	32	34
more than 20 cents extra	%	26	14	22	21
mean	cents/loaf	26.7	15.1	19.9	20.6
median	cents/loaf	15	10	10	10
mode	cents/loaf	5	5	5	5

TABLE 2 RELATIVE IMPORTANCE AND COMPARATIVE VALUE OF SOIL CONSERVATION : SYDNEY SUBURBS : 1985

Income Group		High	Middle	Low	Total
No. of responses		150	100	150	400
Question 1 Preferences for an extra $17m government expenditure (about $15 per household) to...					
Preserve rainforest species	%	28	26	27	27
Get $15 back on tax	%	16	34	26	25
Stop soil erosion	%	43	32	38	38
Preserve rare kangaroo species	%	13	8	9	10
Total	%	100	100	100	100
Question 3 Willingness to pay for control of soil erosion... Cents extra per $1.00 loaf of bread					
zero	%	5	26	25	17
at least 5 cents extra	%	95	74	75	83
at least 10 cents extra	%	56	71	41	53
at least 15 cents extra	%	21	16	14	17
more than 15 cents extra	%	15	13	9	12
mean	cents/loaf	11.4	8.9	8.1	9.5
median	cents/loaf	10	10	5	10
mode	cents/loaf	5	10	5	10

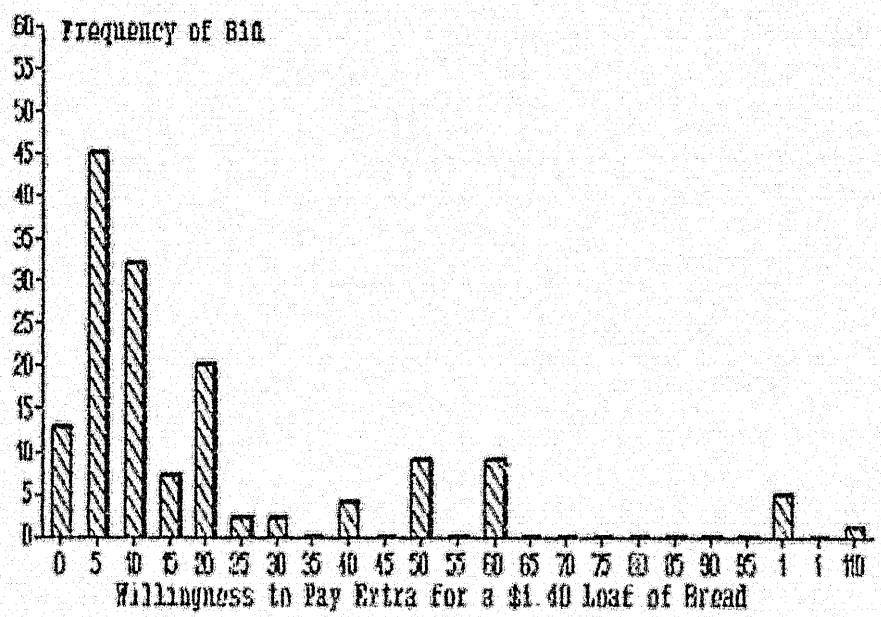
Source: Sinden 1987

TABLE 3 RELATIVE IMPORTANCE AND COMPARATIVE VALUE OF SOIL CONSERVATION : SYDNEY SUBURBS : 1989

Socioeconomic Status Group		High	Middle	Low	Total
No. of responses		306	205	193	704
Question 1 Preferences for an extra $20m government expenditure					
(about $11 per household) to...					
Preserve rainforests	%	22	25	14	21
Get $11 back on tax	%	4	10	11	7
Stop soil erosion	%	19	22	17	19
Prevent Sydney beach pollution	%	55	43	58	53
Total	%	100	100	100	100
Question 3 Willingness to pay for control of soil erosion...					
Cents extra per $1.30 loaf of bread					
zero	%	13	13	23	16
at least 5 cents extra	%	87	87	77	84
at least 10 cents extra	%	64	61	46	58
at least 15 cents extra	%	28	32	21	27

Source: Dragovich 1990

Figure 1 : Willingness to Pay For Soil Conservation
Sydney, 1990



ANNEX 1 : THE QUESTIONNAIRE

Hello, my name is _____ I am conducting a study for the University of New England. Can I ask you three quick questions please ?

1. How would you like to see an extra $45 million of government money spent in 1990? This is about $20 for every family in New South Wales.

   Would you prefer the money to be spent (tick one):

   (a) to preserve rainforest species? ____
   (b) to get $20 back on your tax? ____
   (c) to stop soil erosion? ____
   (d) to preserve rare kangaroo species? ____

2. Now let's consider another set of alternatives.

   Would you prefer this $20 per family to be spent:

   (a) to stop soil erosion? ____
   (b) to prevent pollution of NSW beaches? ____
   (c) to expand the area of forestry plantations? ____

3. The bread we eat is made from wheat, much of which is grown on eroding soils. Suppose a loaf of bread produced from this land costs $1.40.

   (a) Are you willing to pay an extra 5 cents per loaf if all of this 5c goes to control this soil erosion? Yes/No

   (b) Are you willing to pay an extra 10 cents per loaf if all of this 10c goes to control this soil erosion? Yes/No

   (c) Are you willing to pay an extra 15 cents per loaf if all of this 15c goes to control this soil erosion? Yes/No

   (d) Are you willing to pay an extra 20 cents per loaf if all of this 20c goes to control this soil erosion? Yes/No

   (e) What is the maximum you are willing to pay extra per loaf if all the extra goes to control soil erosion? _____ cents.

ANNEX 2 : STATISTICAL PROCEDURE

The two-tailed test for the difference between two means estimated from large samples was performed following Hamburg (1970).

The test statistic is

$$z = (x_1 - x_2) / S(x_1-x_2)$$

where

$$S(x_1-x_2) = (S_1^2/n_1 + S_2^2/n_2)^{0.5}$$

At the 10 percent level of confidence the critical value of z is

$$z^* = 1.645$$

At the 2 percent level of confidence the critical value of z is

$$z^* = 2.33$$

The following parameters were applicable to the test between the estimates of mean willingness to pay in 1985 and 1990.

Parameter	1985 (adjusted to 1990 dollars)	1990
x	13.3	20.6
S	22.0	26.2
n	400	150
x_1-x_2	7.3	
$S(x_1-x_2)$	2.41	
z	3.03	

The decision criterion is reject the null hypothesis

$$Ho: u_1 - u_2 = 0$$

if $|z| > z^*$