Contingent Valuation in Community-Based Project Planning: The Case of Lake Bamendjim Fishery Restocking in Cameroon

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Abstract

The study examined the usefulness and relevance of the contingent valuation method (CVM) in community-based (CB) project planning and implementation. To elicit willingness to pay (WTP) values for the restocking of Lake Bamendjim with *Tilapia nilotica* and *Heterotis niloticus* fish species, the study used pre-tested questionnaires interviewer-administered to 1,000 randomly selected households in the Bambalang Region of Cameroon. The data were elicited with the conventional referendum design and analysed using a referendum model. Empirical findings indicated that about 85% of the sampled households were willing to pay about CFAF1,054 (US$2.1) for the restocking project. This amount was found to be significantly related to the starting price used in the referendum design, household income, the gender of the respondent, the age of the respondent, household poverty status, and previous participation of a household in a community development project. The findings prompted the following recommendations. Firstly, in order to reduce community burden due to cash constraints, it is advisable for the mean estimate obtained for the scheme to be split into four instalments over a year. Secondly, since the success of the scheme largely depends on the governing roles of the scheme, it is further advisable for the community to allow the management of the scheme to be handled by the elderly community members. Finally, it will be important during the financing of the scheme, to levy wealthier household heads an amount sufficient to subsidize poorer household heads who cannot afford to pay the threshold price.

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Acknowledgements

1. Introduction

The economy of Cameroon, like that of several sub-Saharan countries, is characterized by the vicious interaction between severe environmental crises and excruciating poverty particularly in the rural communities. The situation in Cameroon has been exacerbated by the pursuit of structural adjustment policies characterized by a high level of external dependency leading to serious internal imbalances. This has had far reaching implications for the povertyenvironmental nexus in Cameroon. By 1996, barely two years after the devaluation of the CFA franc by the CFA franc zones of Central and West Africa, more than 50.5% (6.5 million) of Cameroonians were considered poor. 56.7% of these were estimated to be residing in rural communities. By 1997, the human development index (HDI) was 0.536 placing Cameroon at position 132 out of 174 countries in Africa (Republic of Cameroon, 2000). Besides this, the incidence, severity and intensity of poverty in rural and urban Cameroon are on a progressive trend (Binam et al., 2004).

This steady rise in the degree and severity of poverty in the country has being attributed to the drastic reduction in government public expenditure patterns that accompanied the devaluation of the CFA franc in 1994 (Fonta and Ichoku, 2005). However, to help ameliorate the general poverty situation in Cameroon, the government instituted several policy reforms. One noticeable reform was the encouragement of non-profit making but fee-charging non-governmental organizations (NGOs), as potential institutions for fighting poverty at the grassroots level. This explains why Cameroon has over 10,000 officially recognized NGOs (African Development Bank, 2002). To encourage meaningful poverty reduction, several of these organizations have initiated poverty schemes that are established, partly financed, and managed at the community level (i.e., community-based financing schemes). For several desk officers and programme planners of these organizations, community-based (CB) projects offer the most cost-effective means of fighting poverty since it helps strengthen the civic capacities of communities by nurturing organizations that represent them. This allows for better targeting of poverty programmes.

However, as this development paradigm enjoys wide acceptability, especially among desk officers and programme planners of several NGOs in Cameroon, it also presents a wide range of operational challenges concerning its implementation (Fonta et al., 2009a). One such operational challenge is how to access the level of readiness of target communities to participate in CB projects aimed at improving their welfare. This is partly the result of lack of knowledge and exposure to existing participatory methodologies that can provide detailed project information from host communities (Fonta and Ichoku, 2005).

The contingent valuation method (CVM) has the potential to remedy this problem. It is one of the most widely used and generally acceptable techniques for estimating the total economic value (TEV) of many classes of public goods and services that few economic techniques can handle. Its results are relatively easy to interpret and to use for policy purposes. For example, monetary values can be presented in terms of mean or median WTP per household or aggregate values for the target population (Fonta et al., 2008; Fonta and Ichoku, 2009). It is, however, unfortunate that the method has attracted little or no attention among desk officers and programme planners responsible for the design of CB projects in Cameroon and elsewhere.

The aim of this study is therefore to shed more light on the usefulness and relevance of the method in eliciting important project information for the design and implementation of successful CB projects in rural Cameroon. As an empirical case study, we used a communal fishery restocking initiative in the Bambalang Region of the Ndop area, Northwest Province, Cameroon (i.e., the re-stocking of Lake Bamendjim with new varieties of fishery stock).

The rest of the paper is subdivided as follows: The next section describes the nature of the fishery restocking scheme in Bambalang followed by the study objectives. Section 2 examines available literature on participatory rural development and the theoretical basis of CVM. The analytical tools and the data are presented in Section 3, while Section 4 reports the empirical findings of the study. The final section is the CVM benefit aggregation and possible policy recommendations for the implementation of the proposed scheme in the area.

The nature of the proposed community-based fishery restocking project

Bambalang is located in the Ndop area of Ngoketunjia Division, Northwest Province, Cameroon. By 2004, the community comprised 15 sub-autonomous communities with a population of approximately 10,000 inhabitants living a few kilometres from Lake Bamendjim.[1] This suggests that enormous pressure is being exerted on the lake's resources. For over three decades, the lake has been a major source of livelihood (fish farming) to the Bambalang people. Other life supporting services provided by the lake include: Fresh water; water for irrigation; transportation; recreational facilities; and most importantly, its role in the local tradition and culture. Over these years, management of the lake's resources, particularly fishery stocks, has been on a communal basis (i.e., common property) with little or no maintenance, or constraint to the rate of use to ensure sustainability (Fonta et al., 2009a). However, occasional measures such as the rotation of fishing sites have been encouraged in the past to regulate fish harvests and also to solve the problem of escalating conflicts over prime harvesting areas for fishermen. This has, however, not solved the problem of over-harvesting but formed the basis for the diversification of fishermen into new fishing areas. This has often resulted in inter-communal disputes over fishing sites amongst the 15 sub-autonomous communities of the region.

Between 1999 and 2000, following a series of inter-communal disputes over fishing sites that led to the destruction of properties and loss of lives, the local authority

constituted a committee charged with the responsibility of providing a sustainable solution to the management of the lake's resources. This led to a series of discussions and consultations between the local committee and technical specialists, policy makers, programme planners, and desk officers of several NGOs on how best to resolve these problems (Fonta, 2006). The result was a proposal to encourage CB natural resource management in Bambalang. In other words, the proposal suggested a plan for communal re-stocking of the lake with more tropical fresh water fish species, and rules for enforcing maintenance and restrictions to the use of the lake's resources. These restrictions included the introduction of fishing permits and the designation of some fishing sites as protected areas (property rights structure).

Thus, the first phase of the CB project in Bambalang was twofold: To design an improved planning methodology that could help elicit information on the value placed by the Bambalang inhabitants on a fish restocking plan, and to determine appropriate households levies or fees designed to reflect fairness and equity in the pricing distribution. A key concept in such an improved planning methodology is that of the "willingness to pay". As part of the effort, it was unanimously agreed that a contingent valuation study of the WTP of households for the restocking plan be carried out, which if successful, would ensure a transition to the next phase of the CB project (i.e., the property rights structure).

The study objectives

The broad objective of the study was to examine the usefulness and relevance of CVM in CB project planning in rural Cameroon.

Specifically, the study aimed at achieving the following:
- To estimate households WTP for the restocking of Lake Bamendjim with more varieties of tropical fresh water fish.
- To identify variables in the study design that can affect WTP of households for the restocking scheme and thus, shed light on the robustness of the survey design and implementation of the study.
- To draw policy conclusions and recommendations for the implementation and management of the proposed CB poverty alleviation project in the area.

Justification for the study

This study is justified on several grounds. In terms of policy, the use of the CVM device in the current context to elicit important project information in terms of project conceptualisation, design, planning, participation and management would form an important starting point for a policy of participatory approach to economic development in Cameroon. This is apart from the fact that the proposed methodology will help arrange development priorities from the point of view of the target community itself. This fits well with the development objectives of most donor agencies that now require prior assessment of a community's level of readiness to participate in projects aimed at improving their welfare. This technical aspect of project design provided by CVM and

lacking in several development projects in Cameroon will help attract project funds, subsidies and grants from the Government of Cameroon and several donor agencies. This would yield direct benefits to the community in terms of expanding resource availability to the poor (through credits or micro-credits, capacity building and occupational training) and allowing the community to have greater control over development assistance. The overall policy implication of the study is that it will help to strengthen the capabilities of other rural communities in the country to undertake self-initiated development activities. This again is good for sustained broad-based growth at the communal level.

2. Literature review

The concept of participatory development

The participatory approach to development, often referred to as the "people centred" approach, basically empowers people and communities to participate in project decisions and processes that affect their lives. It has become a key issue in project design and implementation. It has been variously described to include: An educational and empowering process necessary to correct power imbalances between the rich and the poor (Jennings, 2000); an active involvement of members of a defined community in at least some aspects of project design and implementation (Mansuri and Rao, 2004); and involvement by a local population and, at times, additional stakeholders in the creation, content and conduct of a programme or policy designed to change their lives (World Bank, 2003).

Although the concept existed before Gandhi (1962), it was Gandhi who popularized and enshrined it into mainstream development thinking in his notion of village self-reliance and small-scale development that he believed was a panacea to the corrosive effects of modernization and colonial rule (Gandhi, 1962). This became a source of inspiration to development experts such as Freire (1970), who argues that the "oppressed" needed to unite to find ways to improve their own destinies. Subsequent notions of development were greatly influenced and shaped by the thinking of these two authors (e.g., Demsetz, 1970; Hirschman, 1970; Olson, 1973; Hardin, 1982; Chambers, 1983; Hirschman, 1984; Cernea, 1985; Ostrom, 1990; Hardin, 1992). This great shift in the development paradigm left an indelible impact on the development portfolio for most donor agencies. Most of these agencies now require prior assessment of a community's level of readiness to participate in projects aimed at improving their welfare before granting project funds. Some agencies have even been directly involved in the funding of participatory studies to assess the aggregate willingness to pay of proposed projects of host communities. For instance, the United States Agency for International Development (USAID) has been involved in more than 60 participatory development case studies in Africa, Asia and Latin America (White, 1999). A few of these studies include Whittington et al., (1988, 1989, 1990), Altaf et al., (1993), Mcphail, (1994) and Choe et al., (1996). The methodological lessons (i.e., assessing the WTP of host communities) from several USAID-funded participatory case studies became the benchmark for subsequent economic evaluation of community-based development projects.

The contingent valuation method

In 1963 a Harvard University PhD student, after participating in a survey methods lecture, reasoned that it was possible to "approximate a market" using survey settings wherein alternative kinds of areas and facilities could be made available to the public, and to simulate market-like bidding behaviours (Mitchell and Carson, 1989: 10). Davis (1963), wrote that this method would put the interviewer in the position of a seller who elicits the highest possible bid from the user for the services being offered. Thus, was the bidding game born. However, before Davis (1963), Ciriacy-Wantrup (1952), had advocated the use of the "direct interviewer method" to measure the values associated with natural resource damages. Despite his efforts, this work was considered cursory in its treatment of valuation of non-marketed good and services compared with that of Davis.

The corollaries to Davis (1963) were wide applications of the method to a variety of environmental and non-environmental amenities. Prominent amongst these applications were those of Ridker (1967), who applied the method to value different scenarios of air pollution in two major US cities, and LaPage (1968) and Beardsley (1971) who used less formal CVM techniques to value recreational benefits.

The years 1963 to 1973 were considered the formative years of the method. The year 1974 marked a new epoch in the development of CVM following the work of Randall, Ives and Eastman (Randall et al., 1974). These authors attempted to define and impose on survey a rigorous structural design to differentiate their use of a method whereby values were elicited from individuals (a survey) from "ordinary" surveys. Their survey method was called a "bidding game". Their "structure" was a questionnaire design wherein the WTP question was posed within a context which draws from a market analogy: The context of a contingent market. The context was an effort to elicit behavioural, as opposed to attitudinal, revelation of individual preferences. Their structure, and its variants, is now referred to as the contingent valuation method (Cummings et al., 1986). An empirical case study of the benefits of abatement of aesthetic environmental damages associated with the Four Corners Power Plant and the Navajo Mines in the USA was conducted using the bidding game technique (Randall et al., 1974)

Their study was a trajectory and their effort was notable for, inter alia, its theoretical rigour; its valuation of a good, which could not be valued by alternative techniques; its use of photographs to depict the visibility level being valued; and its experimental designs whereby certain aspects of the bidding game technique (such as payment vehicle) were varied systematically to see if they affected the WTP amounts in some systematic fashion (Mitchell and Carson, 1989).

Thereafter, most CVM studies were unswerving in the pursuit of methodological refinements. Examples include Walsh et al. (1978); Smith (1977, 1979); Brookshire et al. (1976); Rowe et al. (1980), who used laboratory experiments and tested for the presence of strategic bias in CVM as suggested by Ciriacy-Wanthrup (1952) and Samuelson (1954). Their results belied the strategic bias hypothesis. In addition, Mitchell and Carson (1981) tested for the presence of strategic bias in their national water improvement study and found no evidence of this form of bias. Subsequent studies were directed towards testing hypothetical bias and starting point bias induced by the hypothetical nature of CVM and the starting point

bid used in the bidding game technique. An example was that of Thayer (1981).

As more and more CVM studies were conducted to test for different sources of potential biases, it was also apparent that a wider range of operational and methodological problems arose. This led to the Palo Alto conference held in California (2 July 1984). Four eminent economists chaired the conference: Kenneth J. Arrow (Stanford University), D. Kahneman (University of British Columbia), Sherwin Rosen (University of Chicago) and, Vernom Smith (University of Arizona). The theme of the conference was "A State of the Art Assessment of the Contingent Valuation Method". More details of the conference can be found in Cummings et al., (1986).

After the conference, the Exxon-Valdez oil spill incident in Alaska (1989) raised a series of court actions concerning environmental litigation. CVM was brought to the forefront and its usefulness in informing public decision making seriously questioned. The US Congress intervened and delegated the Department of Commerce, specifically the Department's National Oceanic and Atmospheric Administration (NOAA), to commission (1992) a panel (the Blue Ribbon Panel) charged with the issuance of guidelines for conducting CVM studies (Jones, 2003). The guidelines, comments on specific criteria for the development and evaluation of CVM studies are contained in NOAA (1993).

The victory of CVM as a legitimate means for evaluating non-marketed goods was finally won in USA in 1992. Whether the Panel precipitated or mainly hastened the victory of the method will only be acknowledged by the rate of acceptability of the method outside the USA (Blore, 1996). However, Schulze et al., (1996) concluded that the draft NOAA regulations, which resulted from the panel's report, could have the side effects of freezing research by mandating researchers to the use of the dichotomous choice (DC) format which is still under intensive research investigation. Although the DC format is the most widely used in CVM literature, there seems to be no consensus on its usage and comparison with alternative formats continues (Mekonnen, 2000). The panel guidelines for conducting CVM studies are summarized in Box 1.

Box 1: The Blue Ribbon Panel guidelines for conducting CVM studies

1. For a single dichotomous choice question (yes-no type) format, a total sample size of at least 1,000 respondents is required. Clustering and stratification should be accounted for and tests for interviewer and wording biases are needed.

2. High non-response rates would render the survey unreliable.

3. Face-to-face interviewing is likely to yield the most reliable results.

4. Full reporting of data and questionnaires is required for good practice.

5. Pilot surveying and pre-testing are essential elements in any CVM study.

6. A conservative design more likely to underestimate willingness-to-pay is preferred to one likely to overestimate willingness-to-pay.

7. A willingness-to-pay format is preferred.

8. The valuation question should be posed as a vote on a referendum, i.e., a dichotomous choice question related to the payment of a particular level of taxation.

9. Accurate information on the valuation situation must be presented to respondents, with particular care required over the use of photographs.

10. Respondents must be reminded of the status of any undamaged possible substitute commodities.

Box 1: Continued

11. Time-dependent measurement noise should be reduced by averaging across independently drawn samples taken at different points in time.

12. A "no-answer" option should be explicitly allowed in addition to the "yes" and "no" vote options on the main valuation question.

13. Yes and no responses should be followed up by the open-ended question: "Why did you vote yes or no?"

14. On cross-tabulations, the survey should include a variety of other questions that help interpret the responses to the primary valuation question, i.e. income, distance to the site, prior knowledge of the site, etc.

15. Respondents must be reminded of alternative expenditure possibilities, especially when "warm glow" effects are likely to be present (i.e., purchase of moral satisfaction through the act of charitable giving).

Source: Barbier et al. (1997: 44).

The theoretical basis of CVM

The theoretical underpinning of a household's involvement or participation in self-financing or part-financing of public, semi-public or quasi public goods and services, to improve societal well-being, is deeply rooted in the neo-classical welfare economics theory of consumer behaviour, i.e., maximization of utility that gives rise to ordinary demand functions. A simple neo-classical framework for discussing CVM starts with the specification of an individual utility function (Fisher, 1996):

$$u[x, q] \tag{1}$$

where x stands for a vector of market goods and q for a vector of non-market goods, e.g., public goods or services. The set of affordable alternatives is just the set of bundles that satisfy the consumer's budget constraint y and vector of prices $p = (p_x, p_q)$. Note that the individual maximizes utility by choosing a level of x but the level of provision of q is not under consumer control (Fisher, 1996). Against this background, the problem of preference maximization can be stated as:

$$\max u[x, q] \quad \text{s.t} \ px \leq y \tag{2}$$

However, under the local non-satiation assumption, Equation 2 can be restated as

$$\max u[x, q] \quad \text{s.t} \ px = y \tag{3}$$

Solving the above-constrained problem results in an ordinary demand function as follows:

$$x_i = h_i(p, q, y) \quad i = 1,\ldots n \tag{4}$$

which is a single-valued function of prices, income and non-market goods, and also homogeneous of degree zero in prices and income. From the ordinary demand function, the indirect utility function that gives us the maximum utility achievable at given prices and income can be derived as follows:

$$v(p, q, y) \quad u[h_i(p, q, y) q] \tag{5}$$

When the quality of good q changes from q^0 to q^1 (as a result of self-financing or part-financing of good q to improve societal welfare), the individual's utility also changes to:

$$u^1 = v(p, q^1, y) > u^0 \quad v(p, q^0, y) \tag{6}$$

where $u^1 > u^0$ and q^0 stands for status quo level while q^1 for a hypothetical improved scenario. From Equation 6, two well-known measures of utility changes can be deduced (Hicks, 1939), that is, the Hicksian Compensating Variation (CV) and Equivalent Variation (EV) measures of welfare changes (Fonta et al., 2008):

$$v(y \quad WTP, p, q^1) \quad v(p, q^0, y) \tag{7}$$

$$v(y + WTA, p, q^0) = v(p, q^1, y) \tag{8}$$

The first measure represents the CV measure of welfare change. It is defined as the amount of money that, if extracted from an individual after the change in q from q^0 to q^1, will leave the person just as well off as before the change. The second measure is the EV measure of welfare change. It uses the hypothetical improved scenario q^1, as the base case and asks an individual what income change at q^1 would be equivalent to the proposed change in terms of its welfare impact. Alternatively, the EV measure can be seen as the amount of money that an individual would be willing to accept (WTA) to keep the utility constant if the change in q from q^0 to q^1 makes the person worse off (Fonta et al., 2008).

The appropriateness of which measure to use depends on the circumstances involved and what kind of question the proposed policy is trying to address. If the policy is aimed at arranging for some compensation scheme, then Equation 8 is the most appropriate welfare measure. However, if the policy plan seeks a reasonable measure of WTP, then Equation 7 is the most appropriate measure of a welfare change. These two measures have interesting representation in terms of the Hicksian demand curve and Marshallian consumer surplus (Varian, 1992; Mas-Colell et al., 1995). Both welfare measures are essentially what a properly framed CVM survey seeks to achieve. This is done by surveying representative samples of utility maximizers, frequently through in-person interviews, recording their WTP or WTA for the proposed policy aimed at improving societal welfare. These values can be elicited through a variety of elicitation formats[2] including the direct questioning techniques; the iterative bidding techniques; a payment card approach; a dichotomous choice format (referendum techniques)[3]; contingent ranking or a stochastic payment card (SPC) approach.

Despite its theoretical underpinning and methodological rigour, the usefulness of CVM in informing decision making has been the subject of intense debate (Niewijk, 1994). First, CVM detractors argue that the method is too hypothetical in nature since it provides participants with very limited information concerning the characteristics of the goods or services under consideration. This implies that there is a greater tendency for CVM participants to behave strategically when valuing CVM commodities. This is usually manifested in free-riding behaviour, overestimation or underestimation of the true value of the commodity. Therefore, in the actual sense, CVM results may differ considerably from the true market value of a commodity. In this respect, the method could be seen as violating some fundamental principles of economic theory on which it is based. However, the strategic bias proposition constituted the early stages of the refinements and development of the method in the USA, and as part of the NOAA recommendations, CVM practitioners are advised to favour the referendum-like format where there is no strategic reason for a respondent to do otherwise than answer truthfully (Arrow et al, 1993; Carson et al., 2001).

Second, every CVM study confronts respondents with a series of hypothetical prices through a payment vehicle, which directly or indirectly influences their potential WTP amount. This has raised two major criticisms against the CVM by its detractors. First, the starting point bid may suggest incorrectly to an individual the approximate range of appropriate costs for providing the goods or services under consideration; and second, if the offered starting price is significantly different from the respondents' true WTP for the commodity, the respondents may be unwilling to go through the process of searching for the preferences required to arrive at a maximum WTP (Cummings et al., 1986). This would substantially influence the accuracy of CVM estimates and hence, its usefulness for preference assessment. However, conventional wisdom suggests that strict adherence to the Blue Ribbon Panel guidelines for conducting CVM studies is likely to minimize the occurrence of these potential sources of bias.

Third, and most importantly, an issue that has also been greatly criticized in the CVM literature and which has attracted little attention in general, is the treatment of "protest responses" (true zeros and protest zeros). In most empirical analyses, the standard procedure for treating "protest responses" is to exclude such bids from the analyses. The

exclusion of "protest responses" may be deemed satisfactory if not different from the remainder of the sample at least in terms of the covariates employed in the econometric estimation. If this is not the case, the analyst faces a sample selection bias problem, which could have two consequences on the CVM findings (Mekonnen, 2000). First, the empirical analysis of the valuation function used to test for theoretical validity, may generate inconsistent parameter estimates for reasons similar to those described in Heckman (1979). Second, the estimated benefit measures and hence the aggregate values may also be biased. One way of dealing with this problem is to use a sample selection model (Fonta and Omoke, 2008 and Fonta et al., 2009b).

Doubtless, the controversies surrounding the validity and reliability of CVM in informing project/policy decisions making will continue to cause concern to some policy makers. However, no alternative exists for costbenefit analysis, especially for many goods and services that cannot be easily traded in conventional markets. Until a viable alternative is identified, the method will still remain amongst the most favoured analytical tools for project/policy proposition in modern applied welfare economics.

A brief summary CVM applications in some developing countries

In retrospect, it was popularly believed that, absence of public goods values, socioeconomic, political and cultural barriers as well as extremely low levels of environmental awareness would impede the application of CVM in the developing countries. However, several case studies in developing countries (e.g., World Bank, 1993) show that it is even easier to conduct and administer CVM surveys in most of these countries than in some developed countries (Whittington, 1998). However, Carson et al. (1998) point out that to make a study reliable is neither simple nor inexpensive.

The past few years have been marked by extensive application of the method to a wide variety of public goods programmes in Africa. However, most were mainly concerned with valuing specific benefits of water and sanitation programmes (e.g., Whittington et al., 1988, 1989, 1990; Mcphail, 1994; Fonta and Ichoku, 2009), healthcare intervention and programmes (e.g., Onwujekwe et al., 1998, 1999, 2000, 2001; Cropper et al., 2000; Dong et al., 2003a, 2003b, 2004a, 2004b; Asfaw, 2004; Binam, 2004; Onwujekwe et al., 2003, 2004; Fonta, 2006; Ataguba et al., 2008; Fonta et al., 2009b) and the initiation of community-based forestry programmes (e.g., Treiman, 1993; Mekonnen, 2000; Chukwuone and Okorji, 2008).

Very few African valuation studies have actually succeeded in measuring the economic value of fishery management. For those documented, it appears the literature is largely dominated by Southern African fishery valuation case studies (e.g. Attwood and Bennett, 1995; McGrath et al., 1997; Holtzhausen, 1999; Kirchner et al., 2000; Zeybrandt and Barnes, 2001). To the best of our knowledge, there have been no efforts in West and Central Africa, and particularly in Cameroon, to measure the economic value of fishery management. The aim of this study is therefore to close this knowledge gap by providing new empirical evidence on the economic value of fishery management in rural Cameroon.

3. Analytical framework

To analyse the referendum CV question, the censored regression model proposed by Cameron and James (1987) and Cameron (1988) was adopted. The model produces separate estimates for the standard deviation of the WTP and hence, allows easy computation of the confidence intervals for the central tendency measures of WTP (Calia and Strazzera, 2000).

The building block for the model starts with the specification of a linear functional form for the WTP equation as follows:

$$WTP_i = x_i^{'}\beta + \varepsilon_i \tag{9}$$

where WTP$_i$ stands for an individual's willingness to pay for the CB fishery re-stocking project and is assumed to depend on individual's socioeconomic characteristics contained in the vector x_i as shown in Table 1. ε_i is the error term assumed to be distribution as follows: $\mu(0, \sigma^2)$. In Equation 1, WTP$_i$ is considered a latent continuous censored variable: the observed variable is the answer "Yes" or "No" to the referendum CV question concerning the CB fishery restocking project at some offered price T_i. If we let P_1 to represent the probability that an individual's reservation price (WTP$_i$) for the CB fishery re-stocking project is greater than T_i, and P_0 for the complementary probability, we can specify our single-bounds referendum (SBR) model as follows:

$$
\begin{aligned}
P_0 &= \Pr(WTP_i < T_i) \\
&= \Pr(x_i^{'}\beta + \varepsilon_i < T_i) \\
&= \Pr(\varepsilon_i < T_i - x_i^{'}\beta) \\
&= \Phi[(T_i - x_i^{'}\beta)/\sigma] \tag{10}
\end{aligned}
$$

and the complementary probability P_0 as:

$$P_0 = \Pr(WTP_i < T_i)$$
$$= \Pr(x_i^{'}\beta + \varepsilon_i < T_i)$$
$$= \Pr(\varepsilon_i < T_i - x_i^{'}\beta)$$
$$= \Phi[(T_i - x_i^{'}\beta)/\sigma]$$

(11)

where $F[\times]$ is the cumulative standard normal distribution, and the log likelihood function to be maximized for the given sample of n independent observation is constructed as (Fonta et al., 2009):

$$\ln L = \sum_{i=1}^{n} \{I_i \ln[1 - \Phi(T_i - x_i^{'}\beta/\sigma)] + (1 - I_i)\ln[\Phi(T_i - x_i^{'}\beta/\sigma)]\}$$

(12)

where I_i is a dummy variable assuming the value of 1 if answer to the referendum question is "Yes", and zero otherwise. Once the parameters of Equation 12 have been estimated, calculation of mean WTP for the scheme is relatively straightforward as follows:

$$E[WTP] = \bar{x}^{'}\hat{\beta}$$

(13)

where $\bar{x}^{'}$ is the vector of sample averages of the regressors and $\hat{\beta}$ is the vector of maximum likelihood (ML) estimates of the parameters. To calculate the confidence intervals for *E[WTP]*, we can use the analytical formula proposed by Cameron (1991) as follows:

$$CI_{1-\alpha}[E(WTP)] = \bar{x}^{'}\hat{\beta} \pm t_{\alpha/2}\sqrt{\bar{x}^{'}\sum_{\beta}\bar{x}}$$

(14)

where $\sum_{\beta}$ is an estimate of the variance-covariance matrix of the parameter $\hat{\beta}$ (Calia and Strazzera, 2000).

The data[4]

As noted earlier, the actual area covered in the study was the Bambalang community of Ngoketunjia Division, North West Province, Cameroon. Our choice of this community was largely informed by the urgent need to design an improved planning methodology that could help elicit information on the value placed by the Bambalang inhabitants on a fish restocking plan, and on appropriate household levies or fees designed to reflect fairness and equity in the pricing distribution. The study therefore targeted only heads of households or any well-informed adult member of households (i.e., such members were selected on the bases of their economic potential). Fundamentally, the limitation of our sample to this group was purely for economic reasons as demanded by the study. The study required households making hypothetical payments for the provision of the public good in question, and such a decisive decision is usually made by the breadwinner of the family or the head of the family.

The sample size of the study was determined after due consideration had been given to the available funds, the number of enumerators that could be recruited and the time it would take to complete the survey, and most importantly, following the NOAA (1993) guidelines for conducting CVM studies.[5] On the basis of these considerations, it was decided that a total of 1,000 respondents[6] were to be selected for interview. The first draft of the 10-page questionnaire was completed in September 2004 and pre-tested in 14 households. The final form was ready in November 2004, and included comments and suggestions from various scholars.[7] The questionnaire was not translated into the local dialect since all the enumerators were to be recruited from the Bambalang community.[8]

The questionnaire consisted of two major sections. The first section introduced the topic of the survey, the survey objectives and possible outcome of the study to the respondents. This section also encouraged the respondents to provide truthful information and assured them that the solicited information would be treated with anonymity and confidentiality. Other aspects of this section dealt with household characteristics in general, poverty/environmental characteristics, community variables and debriefing questions. The second part of the questionnaire focused on describing the referendum CVM scenario under which the fishery restocking valuation took place. The scenario detailed the scheme to be provided, the current state of fishery management in Bambalang, the hypothetical improved condition pending the implementation of the project, and the way in which each household would pay for the provision of the scheme (i.e., as an increase in household expenditure). Five starting prices were used in the referendum CV design as follows: CFAF200, CFAF400, CFAF600, CFAF800 and CFAF1,000. These prices were selected based on answers to open-ended questions used in the pilot survey.

In planning the survey, we assumed that there was no comprehensive listing of households in the area. However, with some necessary background information and available maps of the various quarters and their population sizes, we constructed a new sample based on a multistage sampling design. At the first stage, a random selection of 10 quarters out of the 15 in Bambalang was taken. Within the selected quarters, dwelling units were stratified into clusters of identical or near identical settlement patterns (i.e., 25 clusters). In the second stage, 40 households were randomly selected from each cluster

and their occupants interviewed, usually the head of a household.

The actual survey lasted from December 2004 to April 2005. During the actual survey it was agreed that five questionnaires should be completed per day for each enumerator. Furthermore, it was agreed that after checking through the returned questionnaires, all enumerators, supervisors and the head of the survey operation would meet every Saturday to review completed copies of the questionnaires. These meetings served as useful forums for debriefing in which common problems encountered in the field were sorted out. Overall, out of the 1,000 randomly selected respondents, 941 were successfully interviewed either during the first visit or during revisit; 59 respondents refused to be interviewed.

4. Empirical results

Sample statistics

A description of the variables used in the analysis, including means, is provided in Table 1. Out of the 941 respondents interviewed, approximately 85% (800 respondents) accepted the initial bids proposed in the referendum CV design (Table 1). However, in terms of household characteristics, the average age of heads of household that participated in the survey was about 40. More than 46% of the sampled respondents were certain that their income would improve significantly six months after the survey. About 70% were very certain that the scheme would be implemented in the community. In terms of distance to fishing sites, the average distance was about 3.6 km. Fewer than 32% of the respondents interviewed were females (not necessarily household heads but some being the next eldest adult in the households during the interview). The average number of people living in a household in the community was about seven with an average monthly income of approximately CFAF21,210 (US$43).[9] Over 71% of the respondents reported having knowledge of poverty while fewer than 36% reported spending less than a dollar a day. Further, more than 89% of the sample respondents were engaged in fishing or fishing/farming. Fewer than 12% of the respondents reported not having participated in a previous community development project in the region. About 89% of those interviewed reported having confidence in the village hypothetical trust fund; fewer than 21% reported having attended school beyond the primary level.

Table 1: Descriptive statistics of variables used in the WTP model

Variable names	Variables description and measurement	Mean	Std. Dev.
Referendum Answer 0.36	1 if respondent accepted the referendum	0 . 8 5 *	
(Dep. Variable)	bid proposed and 0 otherwise		
Starting price 269.13	The starting prices used in the referendum	5 7 8 . 3	
(CFAF) *(US$0.55)*	CV format, 200 ($0.41); 400 ($0.82);	(U S $ 1 . 2)	
	600 ($1.2); 800 ($1.6) and 1,000 ($2.0)		
Age 14.8	Age in years		40.4
Certainty 0.36	Respondent's certainty about future	0 . 4 6 *	
	income flow, certain =1, and 0 = otherwise		

Continued next page

Table 1: Continued

Variable names	Variables description and measurement	Mean	Std. Dev.
Cert_scheme	Respondent's certainty about the implementation of the scheme, certain = 1, and 0 = otherwise	0.70*	0.47
Distance 1.56	Distance to lake from household (km)		3.68
Gender	Male = 1, 0 = female	0.68*	0.47
Household_size	Household size (i.e., number of adults and children feeding from the same source)	7.47	5.63
Household_Wealth	Household wealth index proxy for income (i.e., measured in terms of household assets and other durables)	21,210.41 (US$43.3)	16,035.41 (US$32.7)
Know_Poverty	Dummy for head of household knowledge of poverty, knowledgeable =1 and else = 0	0.71*	0.45
Occupation	Skilled occupation =1, 0 otherwise	0.11*	0.31
Participation	Previous participation in a community development project = 1, else = 0	0.88*	0.33
Poverty	Whether a household head spends below CFAF500 ($1) daily, and ranked as follows: = 1 if spends < CFAF500 and 0 otherwise.	0.64*	0.48
Trustfund	Confidence in hypothetical payment fund =1, else 0	0.89*	0.68
Years_schooled	Total years spent in school, above 7 years = 1, else 0	0.21*	0.41

* Proportion for dummy variables.

Results

Determination of construct validity

Construct validity refers to whether the measurement of interest corresponds to theoretical concepts (Klose, 1999). Hence, it is a form of theoretical validity. One test of validity in contingent valuation study is to assess whether hypothesized theoretical relationships between the elicited WTP and its explanatory variables are supported by data (Mitchell and Carson, 1981). The hypothesis is that if CVM results are construct-valid, the estimated parameters should normally be in accordance with prior expectations (Onwujekwe and Uzochukwu, 2004). Hence, WTP for the fishery restocking scheme in Lake Bamendjim should be explained by many variables.

Data on a wide range of variables that were a priori hypothesized to be able to explain WTP for the fishery restocking scheme were collected (Table 1) and used to investigate the construct validity of the estimates of WTP by means of the censored regression model (i.e., Probit estimation) outlined in Section 6. The dependent variable in the referendum model is the referendum answer (i.e., 1 if WTP > 0 and 0 otherwise). The rest of the variables entered into the estimation as independent variables. The modelling results derived from the Probit estimation technique to explain our theoretical construct of interest are presented in Table 2.

Table 2: Probit modelling results to assess construct validity

Variable	Coefficient	Std. Error	Z-values
Constant	-0.4746	1.7962	-0.26
Ln_Startprice*	-0.3822	0.0426	-8.97***
Certainty	0.2396	0.2428	0.99
Cert_Scheme	0.3410	0.1723	1.98**
Distance	-0.0554	0.0508	-1.09
Gender	0.4284	0.1843	2.32**
Household_Size	-0.0045	0.0149	-0.30
Know_Poverty	0.1094	0.1810	0.60
Ln_Age*	0.5938	0.2278	2.61***
Ln_Wealth*	0.3393	0.1774	1.91**
Occupation	0.2588	0.3426	0.76
Participation	0.7042	0.2499	2.82***
Poverty	0.4500	0.1818	2.48***
Trustfund	-0.0106	0.3562	-0.03
Years_Schooled	0.3591	0.2381	1.51
Log-likelihood	-156.58		
Pseudo R^2	0.57		
Obs.	941		

Significance of parameters * < 0.10, ** < 0.05, *** < 0.01; * Based on test for possible non-monotonic effects, such as the inclusion of terms of higher order (e.g. square and the log transformation of these variables). However, these variables were only significant in their log transformation as reported.

Not too many variables explained our theoretical construct of interest (i.e., the decision to state a positive WTP for the re-stocking scheme). Those identified include: The proposed referendum bid (Ln_Startprice); respondent's certainty about the implementation of the scheme; the gender of the respondent; the age of the respondent (i.e., the log of age); household income (i.e., the log of household_wealth); previous participation in a community development project; and household poverty status.

The effect of the amount the individual is asked to pay for the restocking scheme (i.e., the starting price) was negative, implying higher amounts seem to induce a higher probability not to state a positive WTP value for the scheme. This may be perhaps because of the differential existing between the proposed bid amount and the individual's true

reservation price for the scheme. This is consistent with the traditional theory of consumer behaviour, which states that at higher prices, less would be demanded than at lower prices. Conversely, certainty about the implementation of the scheme in the community has an effect on the individual's decision to state a positive WTP: The more certain the individual is, the greater the probability as explained by the theory of choice under uncertainty. Similarly, male-headed households expressed higher WTP for the scheme than female-headed households did. This can be observed from the positive coefficient on the "Gender" variable with male being the reference point. It could be interpreted as a reaction to the culture and tradition of African households. It is usually believed that males are responsible for most of a household's financial involvements hence the perception that males should pay for such schemes and not necessarily the female heads of household. Furthermore, being younger has an effect on the probability of rejecting the initial bid amount. This is so because the level of poverty in the community acts as a strong push factor to migration forcing younger people to be more migratory than older ones. This suggests that the age distribution in the community is skewed towards old age and justifies the statistical significant of the variable 'Age' in the WTP model.

The same can be said about household wealth: The higher the wealth level, the greater the probability of providing a positive WTP amount for the scheme. This may be explained by considering the fact that when income is high, it is likely that a rational consumer will spend more on goods and services that give satisfaction. The concomitant effects of poverty create disutility to an individual while eradicating it provides a higher utility level. Most people are therefore likely to be more willing to pay to reduce poverty as income rises. Likewise, previous participation in a community development project also increased the probability of providing a positive WTP value for the scheme. Possibly because past experiences to a greater extent inform our current decision processes. Finally, heads of household who spent less than one dollar a day were more WTP for the implementation of the scheme than those living above this amount. This may have been because such individuals presume that if the scheme were implemented, it would significantly raise their incomes.

WTP predictions

As earlier indicated, one major advantage of using CVM in project planning and implementation is that the results are relatively easy to interpret and use for project purposes. For example, monetary values can be presented in terms of mean or median per household or aggregate values for the target population. The mean value for the sampled households is estimated at CFAF1,054 (US$2.1) with associated confidence intervals of CFAF1,023 and CFAF1,085 respectively. The results are shown in Table 3.

Table 3: Descriptive statistics for expected WTP

| Estimator	Obs.	Mean	Std. Dev.	95% Conf. Inv.
Probit model	1,000 (US$2.1)	1,054 (US$1.17)	574.2 (US$2.12.2)	1,0231,085

Regression diagnostics

## *Checking for normality in the residuals for the different starting prices*

A major assumption made throughout the analysis is that the error term in the referendum model is normally distributed. In this section, we explore this assumption using the sub-groups of different starting prices in the referendum model. The Kernel Density Estimates test (kdensity) is used for simplicity. The test simply graphs the residuals of the different starting prices against the normal distribution.

Figures 1 to 5 show kdensity plots for the different starting prices used in the referendum model (i.e., CFAF 200, 400, 600, 800 and 1000). As shown in Figures 1 to 5, the residuals for the different starting prices do not approximate the normal distributions. Theoretically, one would expect such an approximation of non-normality from a comprehensive household survey. Household surveys enumerate individuals with different heterogeneous socioeconomic characteristics such as income, number of years of schooling, household size etc. It is therefore difficult for household survey data to approximate the standard normal distribution. This assumption is often made during estimation for simplicity. Normality of residuals is only required for valid hypothesis testing, that is, the normality assumption assures that the p-values for the t-tests and F-test will be valid. Normality is not required in order to obtain unbiased estimates of the regression coefficients. There is no assumption or requirement that the predictor variables be normally distributed. If this were the case we would not be able to use dummy coded variables in our models.
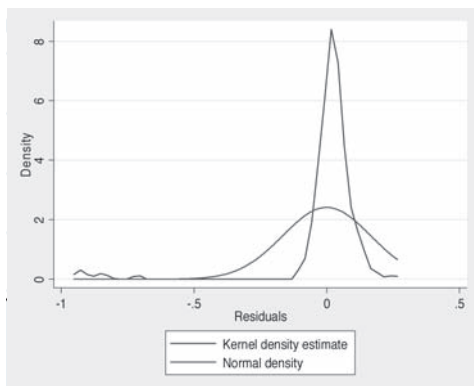
Figure 1: kdensity plot for start price of CFAF200
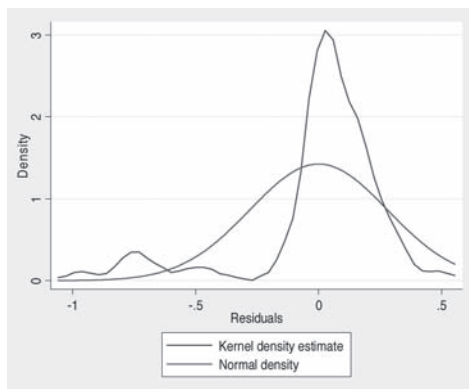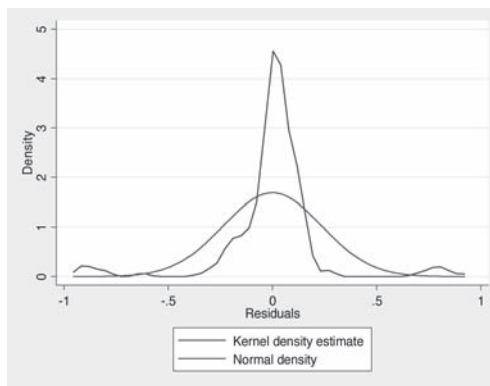

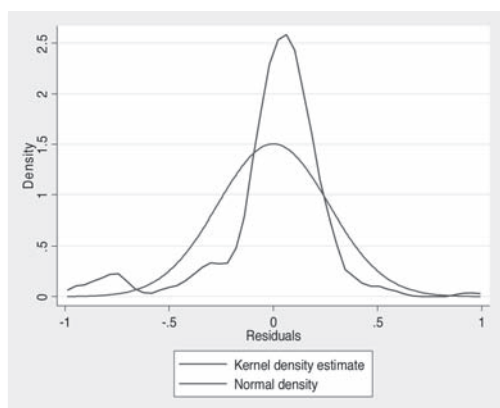**Figure 2: kdensity plot for start price of CFAF400.**
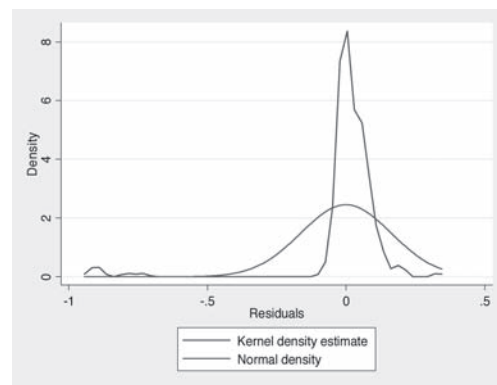
Figure 3: kdensity plot for start price of CFAF600.

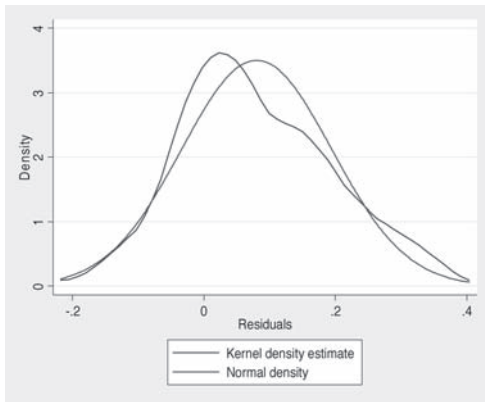**Figure 4: kdensity plot for start price of CFAF800.**

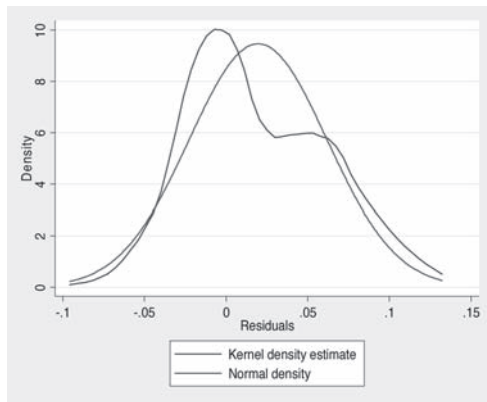**Figure 5: kdensity plot for start price of CFAF1,000.**

However, non-normality of the residual terms can be corrected by using simple techniques such as á-trimming; á-trimming eliminates outliers and erroneous values from the entire data set. Figures 6 to 10, present kdensity plots for the different starting prices using a 5% á-trimming. As shown, the different distributions now approximate the normal.
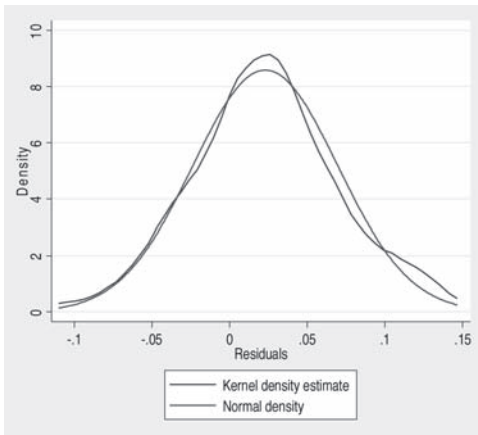
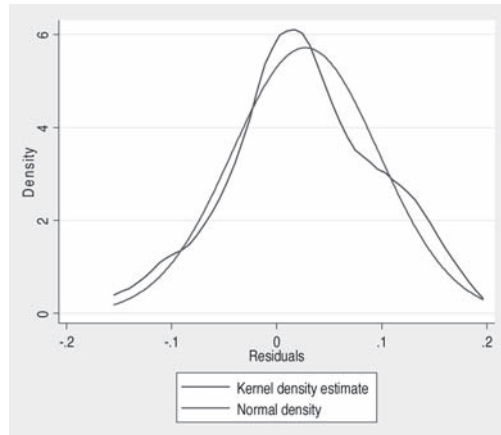**Figure 6: kdensity plot for start price of CFAF200.**

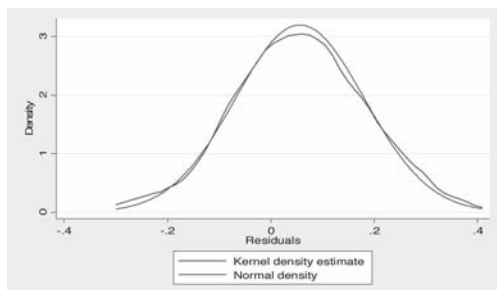**Figure 7: kdensity plot for start price of CFAF400.**

Figure 8: kdensity plot for start price of CFAF600.

Figure 9: kdensity plot for start price of CFAF800.

Figure 10: kdensity plot for start price of CFAF1,000.

5. Benefit aggregation and policy recommendations

CVM benefit aggregation

Based on the above analysis, what possible lessons can be drawn by desk officers in Cameroon for CB project planning and implementation? The most direct way to use CVM findings in project planning and implementation is to compare the total WTP obtained for the project with the actual or expected costs of executing the project. One way of doing this is to aggregate the mean WTP estimate obtained for the project across the relevant population of interest. For instance, Bambalang (the population from which our sample was drawn) contains about 2,266 households (with an average household size of seven, these households include about 10,000 people). Multiplying the number of households by the estimated mean WTP of CFAF1054 ($ 2.1) for the poverty project, yields a total quarterly WTP for the project of roughly CFAF2,388,364 ($4781.3). If this amount is calculated for a year, it results in a total WTP for the project of about CFAF7.2 million ($14,344).

Policy recommendations

Management of Lake Bamendjim fishery stock for the future is vital and deserves consideration. This is necessary in order to minimize the incidence of inter-communal disputes over fishing sites among the 15 sub-autonomous communities in the region. This study was therefore commissioned to design an improved planning methodology that could help elicit information on the value placed by the Bambalang inhabitants on a fishery restocking plan, and hence, the design of appropriate households levies or fees to reflect fairness and equity in the distribution. CVM was therefore used to measure the total economic value of the restocking plan. The results indicated that households in the community are WTP about CFAF1,053.7 (US$2.1) yearly for the restocking scheme. This amount was also found to be significantly related to the starting price used in the referendum design, household income, the gender of the respondent, the age of the respondent, household poverty status, and a household's previous participation in a community development project.

There are several policy recommendations that could be drawn from the findings for the implementation and management of the proposed CB poverty alleviation project in the area. Firstly, and most importantly, it may be necessary to split the mean estimate obtained for the scheme (i.e., CFAF1053.7 or US$2.1), into four instalments payable quarterly (i.e., CFAF250 or about US$0.51) for one year, in order to reduce the burden

on the community occasioned by cash constraints. Secondly, the aggregate WTP for the project (i.e., CFAF7.2 million or roughly US$14,344), should be compared with the actual costs of implementing the proposed scheme. Thirdly, the estimated amount should be used by the participating NGOs to source for counterpart funds and subsidies from aid agencies, donor agencies and the Government of Cameroon. Fourthly, the scheme could be established and left at the hands of the more elderly community members to determine its rules. Finally, during the financing of the scheme wealthier household heads in the community could be levied a higher amount sufficient to subsidize poorer household heads who cannot afford to pay the threshold price.

6. Conclusion

Since the early 1990s, local communities, aid officials, technical specialists, policy makers, and donor agencies in Africa and many developing countries have warmly embraced community-based natural resource management as an antidote to sustainable development. However, as this new development paradigm enjoys wide acceptability, especially amongst African desk officers and programme planners, it also raises a wide range of operational challenges. Prominent amongst these challenges is how to assess the level of readiness of host communities to participate in CB projects aimed at improving their welfare. This is partly the result of lack of knowledge and exposure to existing participatory methodologies that can provide detailed project information from host communities. CVM has the potential to resolve this problem. It is participatory to the extent that it engages the public and policy experts in a dialogue, which most conventional economic valuation techniques cannot accommodate. Its results are also relatively easier to interpret and used for policy purposes. For example, monetary values can be presented in terms of mean or median per household or aggregate values for the target population (Fonta et al., 2008).

The aim of this study is to shed more light on the usefulness and relevance of CVM in eliciting important information for the design and implementation of successful CB projects in Africa. As an empirical case study, a proposed CB natural resource management project in the Bambalang Region of the Ndop area, Northwest Province, Cameroon, initiated by the community, and supported by several NGOs was used (i.e., communal restocking of Lake Bamendjim with more fishery stocks). In the application context, we found that CVM can be used successfully to support design and implementation of the proposed CB scheme, and that analysis of the valuation function using standard econometric techniques can give quantitative information that is difficult to identify using baseline surveys or most conventional economic valuation techniques. For instance, the econometric findings indicated that households in Bambalang are willing to pay about CFAF1054 (US$2.1) for the fish restocking project. This amount was found to be positively and significantly related to household income, the age of the respondent, household poverty status, the gender of the respondents, and household certainty about the implementation of the project in the community as suggested by the theory of consumer behaviour.

Finally, with the growing interest in CB projects as an antidote to community-based poverty management in Africa and other developing countries, we expect the current CVM application to have wide applicability.

Notes

1. Lake Bamendjim is the 17m-deep and 245m-long reservoir formed by the Bamendjim dam. The lake is 344km^2 wide with a capacity of 1.8 billion cubic metres (Ngwa, 1978). The main function of the dam is to increase the volume of water in River Sanaga that supplies Cameroon with hydroelectricity. The dam is located in the Bamendjim community of the Western Province of Cameroon, whereas the artificial lake is situated in the Bambalang Region of Ngoketunjia Division, North West Province, Cameroon.

2. For a fuller discussion on the various response formats, see, for example, Mitchell and Carson, 1989; Freeman, 1993; Schulze et al., 1996; FAO, 2000; Mekonnen, 2000; Fonta, 2006.

3. The conventional single-bounds referendum (SBR) format was used for this study because: (i) it requires only a yes or no response, which usually makes the CV scenario easier for most respondents; (ii) it has been shown to suffer less from incentive compatibility problems than the bidding game technique, the payment cards and the open-ended formats; (iii) it usually mimics people's attitudes in a voting situation and therefore most of the respondents will be familiar with it; (iv) the format permits calculation of an interval estimate; and (v) the method has an extra advantage over others in that it allows for provision of follow-up questions leading to the single-bounded or the double-bounded formats.

4. Details of the survey procedure including the data can be obtained from the first author on request.

5. According to the first NOAA guideline for conducting CVM surveys, if a single dichotomous question of the yes/no type is used to elicit valuation questions, a total sample size of 1,000 respondents will limit the sampling error to about 3% plus or minus on a single dichotomous question, assuming simple random sampling (Arrow et al, 1993).

6. Based on the first NOAA guideline for conducting CVM surveys, we worked out the ratio of 1,000 respondents to approximately 10,000 adult head of households in the community. This gave us a ratio of 1:10, implying a sampling error of plus or minus 1% by standard calculations of sampling errors when certain assumptions are made.

7. Although this was a potential source of error in the study in the sense that second party translation from some of the enumerators might distort the intended scenarios, we tried as much as possible to reduce and account for this source of error.

8, 9. At the time of the survey, US$ 1 = FCFA 490.

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Appendix: Excerpt of the referendum WTP question format used

As you may be aware, majority of families in Bambalang depend on fishing for their livelihood mainly as a source of food and income. As you would have also observed, the cost of selling fish in the market has gone up drastically. The simple reason given by fish farmers is that fish harvest in the lake has drastically fallen and it requires navigating further into the lake to catch fish. One obvious implication of this is that in the nearest future, fish harvesting in the lake would become a major problem. This may lead to severe poverty and hardship in Bambalang since most people depend on fishing for their livelihood. Plan International (PI) and Citizen Development International (CDI), which you are aware have introduced a number of community development projects in Bambalang believe that this situation can be prevented through communal support (i.e., your support). This explains our presence here. If some of you can remember, CDI was here sometime in 2003 to talk about a proposed poverty alleviation scheme that when implemented, would help to increase the stock of fresh water fish species in the lake. This current study is just a continuation of that project by CDI but now in partnership with Plan International.

The aim of this new scheme is to restock Lake Bamendjim with more fresh water fish species for long-term fish productivity in Bambalang. At this point, it is important for your household to understand that this new poverty alleviation project would cost a lot of money since it requires buying and breeding of these fish species in artificial fish nurseries (i.e., fish pond). This is why CDI and PI would like to know how much you as the head of this house would be WTP to support the implementation of the project in Bambalang. Any amount you are willing to pay to support the project would be paid into a community trust fund that will be managed by elected community members. The duration of payments is for one year possibly in four instalmental payments (i.e., an interval of three months). We believe this will give community members sufficient time to raise each amount.

Some of the likely benefits that would be derived from the project if implemented are: (i) poverty reduction; (ii) biological control of malaria; (iii) increased in household income and savings, (iv) more employment opportunities; (v) better transport facilities as a result of more fishing vessels; and finally, (vi) subsidies funds from the government and some donor agencies, which implies household access to more funds etc.

Considering all these benefits would your household be WTP………Frs. CFA* in three installments for one year to establish and manage the proposed poverty scheme? (If no WTP value is reported, asked) why is your household not WTP in support of the scheme?

*The starting price in the referendum design was either: 200, 400, 600, 800 and 1000 Frs. CFA assigned randomly and proportional to the respondents.

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