



Combining focus group discussions and choice experiments for economic valuation of peatland restoration: A case study in Central Kalimantan, Indonesia



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ABSTRACT

This study explores the benefits of combining results of qualitative focus group discussions (FGDs) with a quantitative choice experiment (CE) in a low-income country context. The assessment addresses the compensation needed by local communities in Central Kalimantan to cooperate in peatland restoration programs. The main policy message of the study is that such programs would have to provide arrangements that secure a stable income and food supply, as well as create awareness of the long-term benefits of peatland restoration. The results of this study demonstrate the value of combining qualitative and quantitative methods to improve the reliability and validity of studies assessing the value of ecological services. FGDs prove to be paramount to understanding the underlying attitudes and motives towards the proposed scenarios and its institutional context. FGDs provide the possibility to identify the specific terms and conditions on which respondents would accept land-use change scenarios and help to understand preferences regarding the distribution of costs and benefits over time. Yet the individual CE responses offer important quantitative information about the magnitude of welfare changes associated with restoration. Moreover, the privacy of the elicitation process avoids peer-pressure.

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1. Introduction

Monetary valuation studies are increasingly used in environmental decision-making to evaluate the efficiency, in terms of social welfare improvements, of ecosystem management. Valuation results can be used in appraisal tools such as social (or extended) cost benefit analysis, and for the design of policy instruments such as Payments for Environmental (or Ecosystem) Services or other pricing mechanisms (Bouma and Van Beukering, 2015).

The use of monetary values in environmental management has been criticized widely, on technical, psychological and philosophical grounds (see e.g. Kallis et al., 2013; Spash, 2007), whilst counter arguments are provided in e.g. Gsottbauer et al. (2015). Proponents of monetary valuation methods using Stated Preference (SP) techniques argue that many of the limitations can be improved by appropriate survey design (e.g. Carson, 2012; Loomis, 2011; Vossler and Watson, 2013). Although it could be argued that many published studies do not meet these survey design criteria, monetary valuation, including choice experiments, remains the most

prevalent approach to inform environmental management at present. Opponents have argued for more emphasis on non-monetary and analytic-deliberative valuation techniques to overcome some of the limitations of individual SP studies (e.g. Kenter et al., 2016; Völker and Lienhoop, 2016).

The number of published choice experiments (CEs) has increased rapidly but includes only a few tests of reliability and validity for which the results are mixed (Rakotonarivo et al., 2016). Qualitative approaches offer a venue for testing reliability and validity (ibid.). Focus group discussions (FGDs) are a participatory method that can be used, in the context of environmental valuation, as a non-monetary valuation method to assess the motivation of people's value expressions (Christie et al., 2012), and they are typically focused on current, rather than deliberated, opinions. They have a semi-structured format and take place in a group setting. In combination with SP surveys, FGDs are especially useful prior to quantitative SP to identify relevant hypotheses, and to inform, pre-test and improve the survey design (e.g. Hanley et al., 1998; Johnston et al., 2017; Kenter et al., 2016b). FGDs can also provide diagnostic information after SP elicitation about, for example, differences between the researchers' and respondents' beliefs about the valuation scenario (Carson, 2012; Chilton and Hutchinson, 1999), or to validate WTP values and assess the

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acceptability of SP survey results among respondents (e.g. [Brouwer et al., 1999](#); [Clark et al., 2000](#); [Powe et al., 2005](#); [Powe, 2007](#); [Spash, 2007](#)).

We argue that the above approaches suffer from critical limitations. Firstly, as also noticed for the use of focus groups in combination with contingent valuation (CV) ([Chilton and Hutchinson, 1999](#)), most studies referenced above have limited their FGD focus on either the study design or on the ex-post evaluation of the survey. They often disregard the reporting of the FGD findings: the recorded outcome of the FGDs remains largely anecdotal and detail on the FGD data and analysis is often missing. Secondly, when the FGDs serve the CE analysis, either prior to or after the CE has been implemented, the range of topics they cover may be different or narrower compared with a situation where the FGD is not used to serve the CE analysis. In practice, FGDs for pre-tests tend to focus on the definition of the good under valuation, the interpretation of the scenario text, the selected attributes and levels and the interpretation of specific questions and visual material. Post-CE FGDs run the risk of emphasizing reliability and validity criteria of CEs, including opt-out choices and the monetary amounts, while ignoring other critical decision and contextual factors. Finally, as the discussions in post-CE FGDs usually involve the same respondents, the discussion results may be biased by the framing or narrative of the CEs that the respondents have been exposed to.

The research aim of this paper is to test whether CEs and FGDs result in similar policy recommendations and to evaluate the (dis)advantages of combining these methods. We triangulate the results of the individual discrete CE with FGD results, where the CE and FGDs are implemented simultaneously and involve different samples. The study builds on work by [Powe \(2007\)](#), in which evidence of, and avenues for research on, mixing CV studies and FGDs were explored. We highlight some additional advantages specific to CE and FGD combinations in low-income country settings.

The methods are applied to a case study in Kalimantan, Indonesia, which sought to identify the willingness of local farming communities to participate in a program to plant trees on drained peatland areas, and the level of compensation (if any) demanded. Changes in peatland management were expected bear local costs, in terms of investment in alternative land use practices. However, improved peatland ecosystem management was also expected to generate local ecosystem service benefits from a reduced risk of peat fire and flood events, provisioning ecosystem services, such as timber, non-timber products, fish and other fauna, and cultural services associated with sustainable tree use. The fires lead to damage to property and crops, heavy smoke haze events that cause health risks, such as respiratory diseases, and reduce school attendance.

The design of compensation payment schemes requires understanding the needs of local communities ([Engel and Palmer, 2008](#)), for which FGDs are well suited, as well as a quantitative assessment of the (non-)monetary costs and benefits that communities may face when programmes to secure environmental services are implemented, which justifies using a CE. The values and perceptions towards intact versus highly degraded natural forests have been studied in non-monetary terms ([Abram et al., 2014](#)) and using market prices ([Suwarno et al., 2016](#)). This study presents only the third CE conducted among local Indonesian community members after [Glenk et al. \(2006\)](#) and [Barkmann et al. \(2008\)](#) and it is unique in its focus on peatland restoration on smallholder land.

2. Case study site

The study took place in the Southern part of Central Kalimantan in Indonesia, which is one of the areas with the highest degree of

peatland degradation in South-East Asia. The study concentrated on the Central Kalimantan Peatland Project (CKPP), formed by a consortium of NGOs, which ran from 2006 to 2008. CKPP worked in a specific area in Central Kalimantan to protect the remaining peat swamp forests and restore the degraded peatlands (<http://ckpp.wetlands.org>). This CKPP area was part of the one million hectare Mega Rice Project area, one of the few regions in the world covered with tropical peatlands. Little of the peat swamp forest remains and the degraded area is nowadays used for agriculture, industrial plantations and settlements, or is left as fallow land.

The Mega Rice Project, initiated by the Indonesian government in 1995, converted an area of more than one million ha of peatland forest into rice fields. The drainage and irrigation canals that were constructed to irrigate the fields have led to systematic drainage of the peatland areas. As a result, the area is continuously suffering from river floods and, in combination with El Niño events, peatland fires ([Galudra et al., 2011](#), [Wetland International, 2007](#)). Peatland fires are a large re-occurring problem in Central Kalimantan with high costs at regional and global levels such as loss of biodiversity, forest ecosystems and the associated ecosystem services, smoke-related (trans-)national health problems, and large emissions of greenhouse gases ([Page et al., 2009](#); [Someshwar et al., 2011](#)). Palm oil expansion brings in large short-term revenues but also causes further deforestation: the associated social costs of CO₂ emissions and biodiversity loss outweigh the benefits of palm oil ([Naidoo et al., 2009](#); [Sumarga and Hein, 2016](#), but see [Fisher et al., 2011](#)).

The floods and fires, in combination with unfavourable agricultural conditions of peatland soil, contribute to levels of poverty that are two to four times higher than in the rest of Indonesia ([Wetlands International, 2007](#)). Agriculture is still the most important source of income for the majority of local communities ([Wiken et al., 2004](#)). Compared to other areas of Indonesia, Central Kalimantan is not densely populated. Besides indigenous Dayak communities, there are communities of transmigrants from other islands or other areas of Kalimantan, who were resettled as part of Indonesian transmigration programs or invited to help with the Mega Rice Project ([Galudra et al., 2011](#)). Transmigration has resulted in additional pressure on the limited natural resources and conflicts over land rights and uses. The limited governmental support for indigenous communities and traditional land use practices contrasts with the benefits received by transmigrants. This difference has led to social unrest and even violence.

Our study focused on the ban on fire issued in 2007 by the government of Central Kalimantan which entirely forbade the use of fire in agricultural practices to combat peatland fires. This ban had serious negative consequences for farmers in the region, as burning the top layer of peat is the traditional method for clearing land, producing fertilizers and increasing the pH level. Burning is also used to claim ownership of land. To restore the hydrology and ecology of the peat areas, projects have been set up to build dams that block canals ([Jaenicke et al., 2011](#)), helping to 'rewet' peatland, re-establish vegetation, reduce fire risks, and increase carbon storage.

This study aimed to increase CKPP's understanding of the feasibility of various farmer-led tree-planting projects. In these projects, local farmers would plant trees on their own plots, as opposed to large-scale government-led projects. Farmer-led restoration projects impose costs on farmers, such as the investment in tree seedlings and fire-free land clearing methods. Therefore, some form of actual compensation may be needed. Benefits of tree-planting and mitigation of peatland fires in terms of health risk reduction, flood risk mitigation and biodiversity conservation are enjoyed by the global community. An argument could be made for a payment mechanism funded by this wider community paid to local farmers as an incentive to change their current land use. However, changing land use has major implications for local liveli-

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