Ocean & Coastal Management 102 (2014) 533–544

Contents lists available at ScienceDirect

Ocean & Coastal Management

journal homepage: www.elsevier.com/locate/ocecoaman

Social and ecological impacts of the *Hebei Spirit* oil spill on the west coast of Korea: Implications for compensation and recovery

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ARTICLE INFO

Article history:
Available online 5 July 2014

ABSTRACT

Although several years have passed since the incidence of the 2007 *Hebei Spirit* Oil Spill in Korea (HSOS), but it appears that compensation and recovery efforts are far from being satisfactory and the affected communities are still suffering various adverse impacts incurred by the disaster. This study examines how the levels of compensation for damages from HSOS were determined and discusses whether compensation and recovery efforts were sufficient to resolve not only financial but also social and ecological impacts. We performed a review of compensation processes in several large oil spill cases around the world and found that most of economic losses, evaluated through multiple economic evaluation studies, were actually compensated. In the HSOS case, however, no scientific assessment of the economic costs for adequate level of compensation for the damages was conducted before compensation occurred. We found that only 11% of the HSOS claims were approved for compensation. The size of admitted claims is minimal compared to the economic value of the damage suggested by the contingent valuation literature on tidal flats in Korea. We discuss the adequate level of monetary compensation and recovery efforts necessary to resolve the social and ecological damages and to boost up the regional economy to the satisfaction of the affected populations.

1. Introduction

Despite extensive debates on the adequate level of penalties and compensations for damages caused by oil spills, there seems to be no consensus on this multi-national and multi-factorial problem (Viscusi and Zeckhauser, 2011). There is lack of agreement on how damages resulting from oil spills should be defined and assessed, and on who should be involved in the compensation process. The 1992 Civil Liability Convention (CLC) defined oil spill pollution damage as "loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship," but restricted the compensation of environmental damage to only costs of reasonable measures of reinstatement actually incurred or to be incurred and a monetary loss of profit from such impairment (IOPC Funds, 2014). As a result, the constraint for direct use value following the CLC has limited the amount of compensation from fully reflecting total lost economic, social and ecological value. The lost social and ecological value includes environmental resources from the entire coastal ecosystem, such as passive use value (Carson et al., 2003), ecosystem services value (Kennedy and Cheong, 2013), conservation value (Park et al., 2013), cultural value (Kim, 2013), and other non-use values (Hutchinson et al., 1995). All the subsequent conventions and supplementary funds to the CLC, such as the 1992 Fund Convention (1992 Fund), have also failed to incorporate this aspect, which results in limited compensations and delayed recovery of the communities from the damages.

The economic value of environmental and ecological resources has often been estimated by the contingent valuation method (CVM) since the Exxon Valdez case (Carson et al., 1992). The CVM, referred to as a "stated preference" method, is a survey-based technique for eliciting respondents' willingness-to-pay (WTP) for non-market values (Canh et al., 2006). This method has been widely used to estimate WTP measures for various public assets (Kim et al., 2008; Moran, 1994; Whittington, 1998), and frequently applied as a scientific effort to assess the size of the damage from environmental disaster such as oil spills (Carson et al., 2003; Garza et al., 2009; Kim, 2011). However, most of the CVM studies on oil spills have been conducted in industrial countries in North America and Europe. Besides, very little literature has been dedicated to the

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http://dx.doi.org/10.1016/j.ocecoaman.2014.05.023
0964-5691/

compensation process and results for oil spills and discuss how the economic values of the damaged ecosystem estimated by the CVM study influence the level of total compensation, particularly in Asian countries.

Thus, we assess oil spills since Exxon Valdez in terms of the compensation process, amount, and the roles of economic valuation studies. Based on the lessons from prior cases, we evaluate the 2007 *Hebei Spirit* Oil Spill (HSOS) in Korea, the worst oil spill incident in Korean history. The cost of the losses and damages for HSOS estimated by the International Oil Pollution Compensation Funds (IOPC Funds) far exceeded the limit of the CLC/1992 Fund compensation limit, and most of the claims were not compensated by the IOPC Fund under their strict compensation criteria (Cho, 2010). In particular, the damage estimation and compensation processes for HSOS were extremely debatable since most of the victims were involved in small-scale and undocumented fishing and tourism businesses (Cheong, 2012). Moreover, although there were a few studies which examined the social consequences of HSOS (Cheong, 2011b) and estimated burden of disease attributable to HSOS (Kim et al., 2013), no contingent valuation study has been conducted to directly estimate social, economic or ecological values of the ecosystem damaged by HSOS. Therefore, we analyze the actual compensation practices of HSOS and the level of compensation to individuals and communities in comparison to the total requested claims and the inferred economic value of the damaged ecosystem. We then discuss the major shortcomings of the compensation process for oil spills in Korea and provide policy implications to promote social and economic recovery of the afflicted communities and maximize satisfaction of residents through the compensation process.

2. Lessons learned from past oil spills

A compensation regime for oil pollution damage caused by spills of persistent oil from tankers, the International Oil Pollution Compensation Funds (IOPC Funds), was established in 1971 with support from International Maritime Organization (IMO) (Bowman and Redgwell, 1996). Originally, the 1969 International Convention on Civil Liability for Oil Pollution Damage and the 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution were the basis of the regime. As the amount of compensation required to cover large oil spill incidents increased, two additional legal instruments were created: the 1992 Civil Liability Convention (CLC) and the 1992 Fund Convention (1992 Fund). IOPC Funds is now composed of three intergovernmental agreements: the 1971 Fund, the 1992 Fund, and the Supplementary Fund, which provide financial compensation for property damage, oil cleanup operation, and economic losses caused by oil spill incidents occurring in member states (IOPC Funds, 2012). The 1971 Fund Convention expired on May 24, 2002 but continues to handle oil spill incidents that occurred in member states before that date. The flag of the vessel which causes oil spill, the ownership of the oil cargo or the location of the incident (as long as the damage occurs in a member state) is irrelevant to the provision of financial compensation for oil pollution under the CLC and the 1992 Fund (IOPC Funds, 2014). A third legal instrument, the Supplementary Fund Protocol to the 1992 Fund Convention was adopted in 2003 to provide additional compensation to affected stakeholders when the compensation payment exceeds the limit under the 1992 CLC and the 1992 Fund. Membership of this Fund is optional and open to any members of the 1992 Fund.

The IOPC Funds are financed by contributions levied on entities that bring in crude and heavy fuel oil, exceeding certain amount (e.g. 150,000 tons for the 1992 Fund), by sea transportation to a state party to the Fund Conventions. The member states are required to report those entities and their oil receipts in one calendar year to the IOPC Funds (IOPC Funds, 2014). Among the state parties, 15 constitute an Executive Committee, which plays a major role in approving the settlement of claims for compensation and deciding the limits of compensation (IOPC Funds, 2012). The CLC, which provides the first layer of compensation, governs the liability of shipowners who are responsible for oil pollution damage. Strict liability and compulsory liability insurance (for ships carrying in bulk a cargo of more than 2 000 tons of oil) are imposed on shipowners so that oil spill victims are exempted from proving shipowners' fault (Kim, 2008). However, they are generally entitled to limit their liability to tonnages of their vessels except where they are guilty of fault (Hasebe, 2004).

In addition to the limitation on liability, the IOPC Fund is ultimately restricted in compensation by "the ratio of the global payment limit to the total accepted claims" (Thébaud et al., 2005). This limit follows a principle under Fund Conventions that every claimant should be treated equally by receiving the same proportion of their claim when the total accepted claims accumulate beyond available compensation. If a shortage of the compensation is anticipated, IOPC Funds may establish a certain claim proportion for compensation payment to prevent uneven effects of fund deficiency (IOPC Fund).

A relatively low rate of compensation payment by IOPC Funds could also be because non-use values were disregarded in the damage assessment, which can be considered as an additional restrictive factor in the process of compensation. A resolution of the General Assembly of the IOPC Funds specifies that compensation by the Fund should not be based on "abstract quantification of damage calculated in accordance with theoretical models," implying that the use of valuation methods such as CVM cannot be allowed. This is a basis for not accepting ecological loss related claims unless the costs are directly quantified and related to reasonable measures of reinstatement of damaged environment under the IOPC Funds system (Thébaud et al., 2005). Even with market values, the burden of proof is on claimants to establish the damage incurred by oil spill pollution.

Countries having ratified the IOPC Funds conventions must incorporate them into their national law (IOPCF, 2013). Currently, 111 countries are members of the 1992 Fund and 29 countries in the Supplementary Fund Protocol (IOPC Funds, 2014). Some member countries such as Australia and China established separate compensation systems tailored to their national laws and regulations regardless of the membership of the IOPC Funds (Cheong, 2011a). Although the United States is not an IOPC member state, oil pollution damage has been regulated by Oil Pollution Act of 1990, enacted after Exxon Valdez oil spill. IOPC Funds' limitation on liability and on the types of environmental damage covered by the Funds prevented USA from ratifying the 1992 CLC and the 1992 Fund Convention (Mian and Bennett, 2009). In Korea, the Compensation for Oil Pollution Damage Guarantee Act in Korea (1992) is a fundamental policy and legal guideline concerning marine oil spill damage and compensation, even though the Conventions are effective in Korea without a separate legal device for enforcement (Yun, 2008). Supported by this law, Korea has implemented the 1992 CLC and the 1992 Fund Convention, however, at the time of HSOS, Korea had not yet ratified the Supplementary Fund Protocol and thus is not eligible for compensation under the Supplementary Fund. Moreover, Korea has not joined the IOPC 2003 Revised Agreement that increased maximum compensation level until 2010, and thus the increased compensation benefits by the 2003 agreement do not apply to HSOS. The insufficiency of the compensation based on the CLC and the 1992 Fund was supplemented by the 2008 Special Act enacted in 2008, four months after the HSOS.