

Ten Years after the Oil Spill in Taean: The Recovery of the Ecosystem, the Life of Women, and the Community*

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Abstract

Ten years have passed since the impact of the 2007 oil spill on the ecosystem and life of Taean Peninsula. We have investigated the status of the recovery of the marine environment, local economy, families and community by interviewing the people who have lived in Taean. We especially focused on differentiated impacts of the disaster by gender, and in the local communities. Women showed more severe vulnerability because of the limited job opportunities caused by the implicitly ongoing patriarchy in the society, the job characteristics of *haemyeo*, and underpayment for their labor during the clean-up operations. We also found that there have been social unrests in the local communities originating from conflicts over compensation and allocation of clean-up works, government emergency grants, and local development funds, in addition to high stress levels. The environmental disaster, the Hebei Spirit oil spill, was found to be responsible for the increased number of family break-ups through occurrences such as divorce, intensifying the negative impacts on women. Through this study on the short- and long-term effects of the Hebei Spirit oil spill, we conclude that environmental disasters have more significant and prolonged

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impacts for women and the community from physical, mental, and socio-economic perspectives.

Key words

oil spill, environmental disaster, gender, community, family

Introduction

Korea's largest unprecedented environmental disaster, the Hebei Spirit oil spill, hit Taean Peninsula on December 7, 2007. The oil spill had a multifaceted impact on the ecosystem and the lifestyle of Taean residents, devastating their lives and the local economy. Even though more than 10 years have passed since the tremendous disaster, the residents have still not recovered from the heartbreaking memories of the past years.

Previous oil spill cases such as the Sea Prince, Deepwater Horizon, Exxon Valdez, and Prestige oil spills affected regions and people in a similar way to the Hebei Spirit oil spill, both physically and socio-economically. Physical issues were not merely a short-term problem after Prestige oil spill. By investigating the alteration in chromosome damage between two-year and six-year exposures, Hildur et al. (2015) identified the persistence of chromosome damage in people exposed to the oil spill for six years.

Lee et al. (2010) mentioned that various symptoms have been observed in the nervous, digestive, respiratory, skin, ocular, and musculoskeletal systems, including fevers and injuries, after the Hebei Spirit oil spill. Park et al. (2019), Choi, Lim, Ha, and Sohn (2016), and Kim et al. (2013) also found significant health impacts from the Hebei oil spill, including for children and pregnant women, and quantified those effects on health.

Apart from the physical impacts on residents, there have been numerous studies regarding socio-economic effects. From the economic perspective, the total estimated cost for the economic damage from the Sea Prince oil spill was \$652 million (Kim, 2008). Morris, Grattan, Mayer, and Blackburn (2013), studying the impacts of the Deepwater Horizon oil spill on the community, found that high levels of concern and stress regarding the uncertainty of the long-term ecological and economic impacts were commonly identified by respondents. This stress led to the breakdown of social relationships, a loss of trust in social institutions, and fragmentation of social groups. Picou, Gill, Dyer, and Curry (1992) argued that

overtime, stress, and disruption appeared to be increasingly correlated in Cordova, the selected impact community that was severely damaged by the Exxon Valdez oil spill. The study also showed that social disruption resulted from the oil spill and concluded that the social impacts have emerged as a hardship in living, a prevalence of social distrust.

Nevertheless, there has been limited research on the impact of environmental disasters, including oil spills, from the gender-specific perspective. This paper investigates the impacts of the Hebei Spirit oil spill from the perspective of gender and its differentiated vulnerability. Enarson (2000) found that natural disasters slowed the recovery of women by making them more economically insecure because of a dramatic increase in workloads. Cannon (2002) showed more vulnerability in women than men from the study of the impacts of climate hazards in Bangladesh.

In the research about the extensive oil and gas pollution in Tsekelewu and Opोकaba by Fatusin, Afolabi, and Adetula (2010), women needed to play new roles as fishermen, farmers, and breadwinners in addition to their traditional roles as domestic workers and mothers. Rung et al. (2016) found that women in particular represented a vulnerable yet influential population but have remained relatively understudied with respect to the Deepwater Horizon oil spill. Jang (2016), with a case study of the tsunami in Sri Lanka, emphasized the importance of the gender perspective because the impacts of environmental disasters affect people unequally by gender.

Among the victims of the Hebei Spirit oil spill, the most vulnerable group which included women and children, was not thoroughly considered in the rebuilding process. The main purpose of this paper is to closely investigate the ongoing visible and invisible damage over the past 10 years from the perspectives of gender and community. To analyze the case study from these perspectives, a literature review and in-depth interviews were conducted.

The in-depth interviews were conducted with 12 residents in total. The interviewees had various features with different genders, age groups, occupations, and places of residence (Sowon-myeon, Mohang-ri, Euihang-ri, and Pado-ri) represented. Female interviewees accounted for respectively 58% and all interviewees were aged over 50, except for one who was in his mid-40s. According to the interviewees, younger residents would be hard to find as many of them, along with their children, had already left the city after the Hebei Spirit oil spill. The occupations of the interviewees included the Chairman of the Red Cross, the President of the Women's Association at the time, the Director of Public Relations

at a museum, *haenyeo*,¹ an area representative, the chief of a fishing village, a pastor, and farmers.

In the case of the Hebei Spirit oil spill, women were more severely affected than men. First, the different roles given to women and men resulted in different financial outcomes as most women participated in informal manual jobs. Second, increased women's travel time and costs to places of work worsened their economic hardship and health. Third, gender discrimination was shown by the difference in wages paid for clean-up operations and the limited compensation opportunities. Finally, the heavier burden of labor imposed on women had negative impacts on the well-being of their children. In some cases, women with children could not overcome economic difficulties as they had to give up their income-earning opportunities in other provinces. In addition, the community collapsed as a result of the destruction of life and the economic difficulties caused by the Hebei Spirit oil spill. The chaotic dismantlement of the community manifested itself in three different ways: between the community and other groups, within the community itself, and within the family.

The structure of this paper is as follows: Section 2 reviews the Hebei Spirit oil spill and its physical impacts on the ecosystem, economy, and health. Section 3 reviews the oil spill's significant impacts on women, while Section 4 reviews the impact on the community. The paper ends with the conclusion and some suggestions.

The Hebei Spirit Oil Spill and its Impact

On December 7, 2007, around 7 am, an oil spill occurred at a location five miles northwest off the coast of Mallipo in Taean. A floating crane barge, Samsung No.1, collided with Hebei Spirit, the Hong Kong-registered crude oil tanker, and approximately 10,900 tons (12,547kℓ) of crude oil was spilled into the Yellow Sea. Although an oil fence boom was immediately deployed as an emergency solution, it failed to function in some areas on account of strong winds and tides. In one day, 63,939 residents of two towns and six townships lost their primary means of livelihood.²

¹ *Haenyeo* refers to a female fisherwoman or a group of female fisherwomen who harvest shells, abalones, and sea cucumbers with technical diving skills, using no oxygen supply. The job is recognized as an official job even though it is usually hard for women to get a proper job, especially in traditional communities.

² More details at Taean Environmental Health Center (n.d.). Website, http://taean.go.kr/oilspill/sub01_01.do

Numerous scholars, research institutions, and the South Korean government have studied the physical damage caused by the Hebei oil spill in various aspects. Ha et al. (2014) described the remarkable decline of tourist numbers during and after the oil spill. Kim (2010) mentioned how the Hebei Spirit disaster influenced three villages—Dosan-do, Hajeon 2-ri, and Walsan 1-ri. It was difficult for residents to continue working in the fishery industry due to the contamination in the sea, and the tourism industry, including restaurants and accommodation, was negatively affected by the decrease in the number of tourists. Kim (2012) described how sea pollution was the critical cause of income reduction and economic difficulties since the lives of the *haenyeo* were so closely linked to the beach. The environmental disaster in Taean made every life miserable, regardless of occupation.

The oil spill had negative effects on the residents' physical and psychological health. Kim et al. (2009) studied maternal exposure to volatile organic compounds (VOCs), which have been associated with fetal malformations and miscarriages as well as fetal anomalies and abortion. The result of Jeon's (2013) study showed that 9.4% of participants had experienced asthma, 39.1% allergic rhinitis, 17.0% atopic dermatitis, and 13.6% conjunctivitis. According to Park, Kwon, Jeong, Jong, and Oh (2011), the research participants expressed symptoms such as dizziness, vomiting, visual loss, and skin diseases more frequently after the incident. They mentioned that their worries about economic hardship and worsened health status since the incident had induced mental problems, such as depression about their children. Ha et al. (2013) found that the number of children with wheezing at rest, wheezing after exercise, or treatment due to asthma was significantly higher in children who lived in the highly exposed area. Ha et al. (2013) also stated that the economic problems induced by oil spill incidents have caused psychological distress in communities. The suicides of four local residents within a year after the oil spill showed that their sense of loss was multifaceted and deep-seated. Lee and Yoo (2010) reported that 92.6% of residents thought the oil spill had affected their psychological health. Of these, 69% responded that the oil spill had a large influence, 36% displayed symptoms of anxiety, and 30% said that they had lost hope. Kim and Kwon (2008) also measured the mental health of the Taean residents two to three months after the oil spill; residents showed symptoms of PTSD, and the stress had caused distrust of hostility toward others and society as a whole. The first symptom the residents experienced was anxiety disorder, and trauma became apparent as time passed.

The severe damage to the ecosystem was seen immediately after the incident. The visible damage included the deaths and poisoning of birds and marine crea-

tures, especially those living close to the coastline. PAHs (Polynuclear Aromatic Hydrocarbons) and remnants of toxic chemicals in the ocean had long-term hazardous effects on marine life. A sharp decrease in the number of shellfish showed the enormous damage to the ecosystem. Lee et al. (2009) explained this decrease by stating that shellfish are more vulnerable to PAHs than fish. The major kinds of shellfish cultivated in Taean are Manila clams (*Venerupis philippinarum*) and Pacific oysters (*Crassostrea gigas*). According to Park, Kim, Kang, and Song (2015), the output of clams dropped dramatically, from 10,598 tons in 2007 to 5,048 tons in 2008. In addition, oysters became scarce, leading to the closure of the major oyster farms in Euihang-ri and Sindu-ri for two years.

Ten years have passed since the oil spill but the expert research groups and the Taean residents have completely different viewpoints concerning the level of recovery. The Oil Pollution Center of National Park Service (2018) reported that the ecosystem had now recovered to pre-incident levels. It evaluated the level of recovery to be positive with scientific evidence that proved the stabilization of the plankton population, a small amount of remnant oils around the rocks, and the recovery of the number of marine species to pre-incident levels. It pointed out that whereas in February 2008 oil was present on 33.35 kilometers (69.21%) of the 48.19-kilometer coastline that had suffered damage, including the Taean Coast National Park and the northern coast, since then, it had decreased to 9.86% in 2009, 4.46% in 2010, and zero by 2014.

On the contrary, residents still feel that level of recovery is not enough as they have witnessed abnormal changes in the ecosystem. Our interviewees shared a story of a beach transformed into a mudflat, and how some marine species such as watercocks, goose barnacles, and some types of seaweed were no longer seen in nature. Also, the changed taste of the residents' main snack proved the slow level of recovery in the ecosystem. As a response to our question, the fishing village chief replied with a bitter smile that the taste and smell of sea cucumbers had completely changed after the incident, changing the appetite of the residents.

It seems like sea cucumbers really absorb the oil quite well. They were our main snack when drinking after work. Even if we catch them now, I can still smell the strong odor of the oil. (a fisherman in Pado-ri)

Experts used certified scientific methods whereas the residents evaluated the recovery using their actual experiences. To the residents who had lived their whole life in Taean, the level of recovery in the ecosystem is still not enough. Ten years have

passed since the incident, and Taeon's life has not returned to the pre-incident level.

Impacts on Women

Aftermaths of the collapse of the ecosystem led to the destruction of women's lives. The female residents of South Chungchungnam-do, to which Taeon belongs, are considered to have low socio-economic status (Lim, 2017). According to the research, 42.1% of the fisherwomen participate in manual jobs such as shellfish cultivation and harvesting. In addition to the fishing-related manual jobs, they are also engaged in various subsidiary activities—running restaurants and Korean-style B&Bs, or working part-time jobs—while most fishermen play a primary role in fishing or fishing-related business with their own capital.

Women in the rural areas of South Korea, where a large proportion of the elderly is concentrated, are known to be particularly vulnerable due to the intense patriarchal structure within the family and society. The patriarchy oppresses and exploits females by positioning them at the bottom of the patriarchal pyramid for the so-called “benefit of the entire family” (Park, 2001). The house chores and childcare are the “mandatory” and unremunerated female contribution to the family. Such a system doubles the women's burden when they have to handle both internal and external duties. Moreover, the jobs and roles in society are divided by gender rather than individual's ability; women are usually the subordinate labor and their jobs are considered less valuable than men's.

According to Choi, Hwang, and Eom (2005), the general working time of women was longer due to the combination of subsidiary jobs, caring for the children, and household chores. Although these women contribute a great part of the family economy, many recognized themselves as “secondary fishermen.” This is also the case for women in Taeon, where 75% of all the residents were involved in some aspect of the fisheries industry (Overcoming the Taeon Oil Damage Memorial Exhibition, 2017). Most fisherwomen in Taeon had fishing-related manual jobs, including shellfish cultivation as well as repairing fishing tools, and processing and selling marine products. Particularly in Taeon, 300 fisherwomen are *haenyeo*. In these families, women play the role of breadwinner with men helping the household chores.

Our husbands in Taeon are so incompetent and useless. Therefore, most *haenyeo* are the head of the house, taking responsibility for the family. (*haenyeo* in Mohang-hang)

Even if the socio-economic status of *haenyeo* was much higher than that of women in other manual jobs, *haenyeo* were just as severely damaged by the oil spill due to the characteristics of the women themselves and the types of fish they catch. On account of the different roles implicitly and naturally assigned to women and men in Taean, the impact of the same oil spill varied by gender. The unfavorable conditions imposed on women resulted in several restrictions and difficulties for them. First, since the jobs in which women are allowed to participate are limited, the solutions open to them after the incident were also limited. The manual jobs that most women had were usually in the informal sector and considered marginal and minor in society. For example, as owning or operating a fishing boat requires the investment of capital, only men who can benefit from the inheritance culture are capable of operating and buying ships.

On the other hand, as women do not have enough capital to pay initial business costs, they usually find jobs with lower barriers to entry, such as shellfish cultivation. In the event, these limited conditions women face had serious consequences. Although both women and men work in the fishing industry, the sort of fish they catch is different because of the limitations on women's economic activity. *Haenyeo* and fisherwomen catch those with limited mobility (e.g., shellfish and abalone), whereas most fishermen catch fish that can swim to less contaminated areas to increase their survival rate. The level of recovery varies by the sort of fish, and the slower recovery rate of shellfish and abalone led to a slower recovery in women's economic conditions. On the other hand, men with fishing boats could sail further from the original fishing sites to areas where clean fish were available, meaning that men had more opportunities to recover their income level. One interviewee mentioned the slow recovery of the shellfish cultivation industry and the faster recovery of the fishing industry.

The workers in shellfish cultivation, even if seven years had passed after the incident, still could not catch enough shellfish or any shellfish at all. They had to shift their work to agriculture even if the wage rate is lower. The fishing industry has been much recovered, people catch enough fish now. (a woman chairman in Taean)

Second, women's deprived conditions affected not just their economic vulnerability but also their physical health. Unlike men, women had to move further for work as the transition to another workplace was extremely hard. For instance, Kim (2012) described how the oil spill generated socially negative influences for *haenyeo*

living in Gupo-ri. In the *haenyeo* community, there are two types of *badang*³; the private *badang* that only *haenyeo* with specific permission are able to use, and the public *badang* that every *haenyeo* can use without needing permission. Most *haenyeo* worked in private *badang*, which were assigned to each of them. However, after the oil spill, all the *badang* for Gu-pori *haenyeo* were so contaminated that they could not maintain their jobs and were forced to shift their workplace to the public *badang* that everyone could use. Due to this, about 50 *haenyeo* were concentrated in the limited space of public *badang*, and monthly earnings dramatically decreased to between \$442.00 and \$883.90 per person, whereas monthly earnings before the incident ranged from \$1,767.90 to \$2,209.90 per person. Moreover, the change of working place resulted in additional travel time, ranging from 15 minutes to 2 hours a day, which increased the cost of ship operation and physical stress. Our interview with a *haenyeo* also showed how hard it was for the first two years after the incident as *haenyeo* in Mohang-ri were earning only \$353.50 to \$441.90 per month. During the period, they had to work outside water such as shellfish cultivation and clean-up operations because the water was so contaminated they could not go in. Even after the marine environment had recovered to some extent, the oil had deeply permeated the ocean floor and sea cucumbers and abalone were rarely seen. The case of the *haenyeo* thus shows clearly how women were significantly affected by the loss of workplace.

Third, gender discrimination during the compensation process highlighted women's vulnerability. They faced financial discrimination during the rebuilding process from the point of view of compensation. As women had irregular or cash-paid jobs where proof of work was not issued or kept by, for example, fishery farm owners, most women did not have official proof of their past earnings, which had to be submitted to be eligible for the compensation fund. In fact, the Overcoming the Taean Oil Damage Memorial Exhibition (2017) states that only 10,000 workers in manual jobs are officially registered. In addition, the International Oil Pollution Compensation (IOPC) Fund's unclear compensation standards did not allow for the characteristics and traditions of women in rural areas. Women's loss of income was therefore even more serious than that of men. As time passed, solutions to providing compensation for those involved in shellfish cultivation were found, but the women who worked in subsidiary work (e.g.,

³ The *badang* is the designated area in the sea where *haenyeo* can work. It is designated by the local government.

untangling fishing nets) could not find a way to receive compensation.

Also, stereotypes regarding physical strength caused further discrimination. The stereotype that women are weaker than men led to a situation where women earned a lower clean-up operation fee (\$53.00) than men (\$61.90), even where the work did not require strength and power. One of our interviewees said that there was no significant difference between the jobs of men and women. Neither the men nor the women seemed to recognize other components of equality other than the physical. They did not place as much significance on economic inequality and psychological hardships that women would face.

Finally, women's traditional roles and responsibilities limited their options. Similar to other females, especially in developing countries, women were naturally assigned the role of having full responsibility for the children as a mother. According to our interview in Mohang-ri, the emergency responses of *baenyeo* after the oil spill differed depending on family status. At times when the hardships of live could not be overcome, *baenyeo* with family to take care of had no or less discretion regarding what to do and were unable to go far to harvest marine products. On the other hand, *baenyeo* without any family had more freedom of movement and discretion without having to take other factors into consideration; these *baenyeo* moved to a different province, like Jeolla-do, whose brand image for seafood was much more positive. Therefore, whether *baenyeo* had dependents or not was a crucial factor in deciding to move and live in other areas as the responsibility to care for family was the major role for women in Taean. In addition, as women were assigned double burdens (both household and economic roles), it may have led children to suffer from physical and psychological illnesses. Some studies from outside Korea, such as Redlener (2010) and Ha et al. (2013), assert the prevalence of insecurity among children during times of environmental crisis. Persistence of uncertainty, family and parental dysfunction, and severe economic stress could all have an impact on the emotional, mental, and physical health of children. Therefore, considering the fact that children in Taean had to move from parents' to grandparents' supervision, we can presume there were disruptions on everyday routine and psychological insecurity could have risen.

Impacts on the community

The Taean community collapsed after the Hebei Spirit oil spill hit the peninsula. Kim and Kwon (2008) analyzed the conditions of the community over time phases. The study found that immediately after the oil spill, all the members of the

community became united and joined efforts to solve effects of the disastrous incident. However, the community showed signs of disintegration after a certain period of time when conflicts of interests arose among the residents over the compensation issues which were crucial for their livelihood. Based on our analysis, the conflicts can be categorized into three different levels—between the community and other groups, within the community, and within the family—and the compensation, high stress levels, and the double burden of labor for women were common factors in these conflicts.

As the compensation was directly related to sustaining the lives of the residents, related issues were always the hot potato in every discussion after the oil spill. The major compensation opportunities were the government's Emergency Livelihood Funds, the IOPC Fund, and the West Coast Regional Development Fund from Samsung Heavy Industry. In the compensation process, conflicts arose due to various reasons, such as the unequal amount of distribution, ineffective fund management by those concerned, and insufficient financing of the fund. Compensation issues led to external as well as internal conflicts in Taean. High stress levels due to the devastating state of the environment surrounding the residents triggered more community conflicts internally.

As mentioned earlier in Section 2, Lee and Yoo's (2010) survey showed high stress levels among the residents, and most of the reasons for this stress were related to the negative consequences of the oil spill. The psychological instability of Taean residents worked as a factor contributing to conflicts within the community and families. In addition to the high stress level, the doubled burden of labor on women was deeply related to both these types of conflicts. After the incident, the residents' hectic life had resulted in an absence of 'labor exchange among women' in the community. Mothers in Taean in particular used to exchange labor such as childcare whenever needed. However, there was no help available after the incident as every woman was given a heavy workload such as extra part-time work, clean-up operations, and protests on the top of the original responsibilities of education, child care, and household chores.

Conflicts between the community and other external groups

At the first stage of the oil spill clean-up operations, the government financially supported the Taean residents through two separate disbursements of Emergency Livelihood Funds (\$53,655 in total). The government only provided general guideline for the distribution of these funds, and the local governments of each region

had to decide on the exact details. In making the first of these payments, the local government decided on the different amounts they would allocate to each village but left it up to those villages to decide on the distribution method. This meant that payments varied depending on where people lived and, because of the distribution methods adopted, the type of job they had. This graded payment system led to intense complaints from the residents.

For the second payment, the conflicts were resolved by the local government's efforts to heed and take account of public opinions through public hearings and discussions. The government structurally graded the areas, the types of business, and the number of family members in a house based on the degree of damage from the oil spill, and distributed the funds depending on the grade (Ministry of Land, Transport, and Maritime Affairs, 2010).

Institutional problems concerning reparations and compensation assessment carried out by the IOPC intensified the pre-existing conflicts. According to the interviews, many of the residents considered the assessment inequitable as the IOPC claims manual was too strict. The manual states that the workers in the fishing-related industries had to prove the following: proof that the damage was caused by the oil spill, the period of the damage, and a three-year history for the details of monthly income or monthly sales of the products caught, harvested, or processed.

It was extremely difficult to submit the types of proof described in the claims manual, especially for the informal jobs that most women in Taean had. Therefore, the damage recognition rate was low at the first stage. One of our interviewees also shared an experience about the IOPC fund's unclear and unfair standard. In the case of the shellfish cultivation industry, the workers had to appoint a lawyer through the National Federation of Fisheries Cooperatives at a fee of \$176.80 in order to receive the compensation. However, the compensation amounts received varied without any acceptable explanations. The interviewee further underlined the lack of clear standards by mentioning that different workers received quite different amounts, some as high as \$1,767.90, even though all of them worked in the same fishing industry. In addition, damage to businesses lacking official permission could not receive compensation at all.

Another factor was that Samsung Heavy Industry's avoidance of social responsibilities worsened conflicts between them and the community. Samsung, the perpetrator of the incident, sought only to minimize its responsibility by taking legal actions, and remained silent in response to residents' complaints and demands. Its official statement of apology was published on January 21, 2008, the

day following the police announcement of its interim investigation report. The statement argued that the incident had been beyond its control due to the weather conditions.

According to the Foundation Corporation of the West Coast Union (n.d.), Samsung Heavy Industry announced the donation of \$88 million in February 2008 as the West Coast Regional Development Fund, which the residents flatly refused to accept. Following five years of disputes, Samsung and the residents' associations of eleven damaged cities reached an agreement for a donation of \$318 million in November 2013, of which \$256 million was deposited into a bank, and the rest donated in forms such as social welfare and other means.

However, it took another five years for the funds to be delivered to the associations due to additional conflicts over the distribution of the fund among the damaged areas and over which association would manage the fund. Moon (2018) reported that by December 2018 the interest accruing to the deposited funds had raised their total to \$271 million with its interests, and 66% of the fund (\$179 million) was finally distributed to the Hebei Social Cooperative Association to which Taean belongs. Currently, Taean is to receive 74.2% of the fund that the Hebei Social Cooperative Association received (\$133 million), but conflicts are still ongoing regarding the criteria for membership of the association—registered fishermen and fisherwomen or all of the residents.

As the oil spill affected numerous regions, conflicts of interest were inevitable in the compensation process. Surprisingly, a striking number of interviewees doubted that they were paid less than people in a different province when they were the most affected victims. However, unequal distribution methods in the first payment from the Emergency Livelihood Fund caused intense conflicts between the residents and the national government or local government. The unclear standards in the IOPC claim manual also triggered various protests and complaints from the residents. As some people believe that they have not yet received adequate compensation for the damage suffered from the oil spill, the issue of compensation remains to be finally settled. These prolonged conflicts had negative consequences on the residents as well.

In addition to this, the more severe impact on women was caused by the absence of women's voices in the official decision-making process. Even though our female interviewees mentioned how passionate they were, leading and participating in the civil protests, Lim (2017) shows that fisherwomen's participation rate in the fishing-related associations was only around 5% in Chungchungnam-do. Most of the village chiefs who made the contentious decisions were men, and only one

of the eleven members of the Oil Spill Area Victim Committee was a woman. The conflicts in the community could have been handled better with more female representatives in the decision-making process.

Conflicts within the community

The conflicts within the community were the most severe consequence and eventually led to a prevalent social distrust. The economic issues including compensation, high stress levels, and the double burden of labor for women were the main factors that triggered the conflicts.

In June 2009, the IOPC reached an agreement on the categories of the harvesting fishery industry, stating that the workers in the industry had to either have held registration cards before the incident or have registered after the incident, and had to have actually been living in the fishing village within the work area. Despite the efforts to improve the standard of the claims manual, the new agreement worsened the conflicts as some residents who did not actually work in the harvesting fishery industry illegally reported damage so as to obtain compensation, supported by false statements from the chiefs of the fishing village.

The transparency of the village chairmen or the leaders was not guaranteed at the time. The interviewee also mentioned that the rush to gain as much compensation as possible after the incident led to the fragmentation of the community. The workers in each type of business (e.g., fisheries, *baenyeo*, restaurants, accommodation) spoke as separate groups in order to gain a bigger slice of the compensation fund, thereby weakening the solidarity of the Taean community.

In addition to the compensation issue, the economic difficulties caused conflicts within the *baenyeo* community. Based on our interview in Mohang-ri, the area recovered relatively faster than other areas because of its strong tides. However, as people outside Taean had negative perceptions of products from Taean, those products were not as attractive as they had been before. As a result, *baenyeo* had disputes over whether to harvest the marine products or not, even when they were available.

Psychological stress also led to neighborhood conflicts. Since the houses were highly concentrated in every village in Taean, daily exchanges among residents had been frequent before the incident. However, Kim and Kwon (2008) show that daily exchanges among neighbors have decreased since the oil spill, arguing that the deterioration in health slowed community recovery by reducing social

exchanges.

Our interviews also mentioned that the double burden of labor for women decreased the daily exchanges among the residents and negatively affected the relationship among the neighbors. The survey results from Lee and Yoo (2010) also show that 85.9% (128 respondents out of 150) thought their relationship with their neighbors worsened after the incident. Our interviews show that there were reasons for the loss of solidarity. The interviewees mentioned that negative emotions toward neighbors such as antagonism and jealousy were prevalent after the incident.

As a result, people avoided involvement in cultural activities due to the rumor spread among people had been involved in those and were doubted to have received a large amount of compensation. Furthermore, the high stress levels had a negative impact on the relationships in the neighborhood. The residents had not only been exposed to harmful chemicals, but had also experienced PTSD as part of the psychological impact of the incident. In fact, according to the interviewees, residents complained of mental as well as physical pain, avoiding meeting any neighbors. Our interviewees even argued that the sense of community and the degree of trust among the residents were the least recovered part of Taean.

Conflicts in the family

Psychological instability due to economic difficulty and the double burden of labor for women led to the breakdown of many families. Lee and Yoo (2010) evaluated the relationships among family members, and the result of the survey showed that 64.9% (96 respondents out of 150) of the sample residents felt that the family relationship had worsened after the oil spill. Davis (1996) asserts that family collapse was similarly evident in the case of the Exxon Valdez oil spill. According to our interviews, the disintegration of family relationships was seen in the divorce of the parents, or the children being left alone with their grandparents. One interviewee explained this matter by mentioning the economic hardship due to the loss of the means to earn money, and the mental stress each family member had experienced, with the more frequent conflicts leading to the family breakdown. In fact, the interviewee stated that family troubles intensified during the period when there was no income at all. Moreover, lack of economic compensation and more time needed for the local restoration have made it difficult for adults to be home and to take care of their children, and this situation eventually led to the dissolution of some families. In particular, the absence of

“labor exchange among women” in the community subjected women to a heavier workload, being unable to take care of the family. Our interviewee explained how the women’s burden doubled compared to men.

In the case of men, the day ended after the clean-up operations. However, women’s workload doubled or even tripled as they had to do household chores after clean-up operations. (the commentator of the Oil Damage Memorial)

As a consequence, many of the families faced breakdowns and children were left uncared for. The results from the 2005 and 2010 census show family breakdowns increased after the oil spill. The proportion of two-generations households⁴ where couples were divorced almost doubled, rising by 49.3% from 2.7% to 4.1%. Furthermore, Song et al. (2010) shows that on average 10% of the families were single-parent families, but only 1.9% of the interviewed children showed satisfaction with the social welfare system for children. Ha et al. (2014) shows its survey results, in which 25% of the sample children answered that policies for lives safe from crime and sexual abuse were needed. Our interviewee also mentioned that after the oil spill, the children became emotionally exhausted. The children faced problems in their relationships with friends as well as their studies at school, thereby suffering collateral secondary after the oil spill. As there are numerous children who live with one parent or with grandparents, such children are likely to believe that they have been abandoned by one or both parents. After the incident, as adults focused less on the children and did not show them the same levels of care, the children thought of themselves as being neglected by their families. The interviewee also mentioned that children participated in part-time job more frequently after their families collapsed by the oil spill. Therefore, child care became the responsibility of a third party such as churches and public sector. External parties such as the Mallipo Church and the children’s center tried to protect those facing challenging situations with their living conditions by providing foods, shelter, and activities.

⁴ A “two-generations household refer to households containing two generations. In such a house, the official owner of the house and their lineal family members or relatives of collateral family members live. Examples are the household of a married couple and their child, that of a father and his child, that of a mother and her child, that of a married couple and their parents, and that of grandparents and their grandchild.

Conclusion

The environment, economy, and health were not the only parts of Taean that suffered severely from the man-made disaster. Women's lives and the life of the community as a whole was destroyed as society was overtaken by feelings of rage and depression. Previous research mainly focused on the impacts on the ecosystem, physical and psychological health, and the economy. Even in the case of the Hebei Spirit oil spill, all the studies targeted only those aspects.

Our paper is the first attempt to investigate the short-term and long-term impacts of the disaster from the perspectives of gender and community through on-site interviews with the victims of the Hebei Spirit oil spill. We found heavier impacts on women and an escalation of conflicts within the affected community.

Informal jobs, which are traditionally the only opportunities for women to earn income, are the principal cause of women's high vulnerability because the marine products women produced needed a longer time to recover. Women with children in particular had to invest more effort and time in recovering from the financial difficulties because of the limited alternatives such as working in other provinces or switching jobs. The factors of limited employment opportunities for women, which were confined to the informal sector, and the structural discrimination from which they suffered led to an intensification and prolongation of their economic hardship at the compensation stage because they were unable to provide the documents needed as a proof of employment or earnings. The fact that women found their available time reduced by the demands of the increased burden of labor also resulted in the deterioration of the children's well-being. Considering that women and children are more vulnerable to environmental disasters and have a high possibility of being excluded in decision-making processes, careful attention is warranted to minimize the differentiated impact on them in the process of recovery from the disaster.

The economic hardship, psychological health issues, and the double burden on women triggered and accelerated the collapse of the Taean community. In the process of recovery over the last ten years since the Hebei Spirit oil spill, the community experienced another round of conflicts, resulting in four suicides. Those conflicts arose from the strict and inflexible design of the claim manual and discriminative compensation, compounded by a distrust arising from the misbehavior of leaders and psychological damage from the oil spill. The compensation was only for the physical damage and income loss; there was no compensation for psychological impacts. Unlike the adults and the elderly, children did not receive any

compensation, for neither physical nor psychological impacts.

However, in our interviews, we found that the impact on the community could vary depending on the risk management. There were exceptional cases where there were no conflicts or where situations of conflict improved following an initial deterioration. Solid transparency such as democratic decision-making with all members of the community involved led to potential conflicts being avoided. Strong camaraderie formed from years of working together lowered the possibility of conflict in the smaller communities such as the *baenyeo* (Kim, 2012). The leader's attitudes in playing a liaison role between the residents and the authority were critical in gaining the trust of the community. The community-shared space could provide an environment that served to ease the conflicts and to promote community unification through frequent informal contacts among the residents, as the interviewees pointed out.

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