Social Process for Wind Farm Construction in Jeju Island: A Case of PIMFY-ism

Shin-Ock Chang (Jeju National University, South Korea)
Atsushi Nozawa (Meiji University, Japan)

Abstract

The paper presents a case of PIMFY-ism concerning the introduction of wind turbines into a local place. Our observation made for Jeju Island (South Korea) contrasts tothe previous findings that report local resistance to wind turbine construction. The island has been a mecca for wind farm construction for the last decade in Korea. The island's plenty of wind was a challenge to islander's livelihood activities in the past but it has now turned to be an economicsource for supporting villagers through compensation arrangements. By highlighting two case studies, we made it clear social process by which wind turbine construction projects were negotiated and implemented. Our study pointed to the significance of an economic situation of a local place in shaping local attitudes to wind energy investment.

Keywords: wind farm; PIMFY-ism; Jeju Island; renewable energy.

Introduction

The risk of nuclear power was reawakened to global community by Fukushima nuclear accidents in Japan in 2011. The awareness was manifested in worldwide anti-nuclear power movement; and Reuters soon reported German government's announcement to beclosingdown the entire nuclear power plants of the country by 2022 (Breidthardt 2011). Replacing nuclear power and fossil fuels,wind power isan emerging promising energy source in the twenty first century. Wind power holds several charming characters as an energy source compared to nuclear power and fossil fuels in terms of zero emission of carbon dioxide and its safety in operation. In addition, wind power is cost effective in its investment compared to other renewable energy sources. In this reason, many of nation states have embarked upon wind energy development (Mostafaeipour 2011). The paper aims to understand the transition in energy politics by paying attention to local contextswithin which installation of wind turbines is negotiated and implemented. Our research interest is given to South Korea(hereafter Korea) where wind farm construction has taken a visible shape for the last decade with government's green growth policy scheme.Although Korean government reaffirmed its will to maintain nuclear energy as a dominant source for electricity supply even after Fukushima nuclear accidents,it stated the vision ofestablishing new and renewable energyproduction systems. The government projected 59% of total electricity supply to be made from 40 nuclear power plants by 2030. At the same time energy generation from new and renewable energy sources is targeted to increase nearly fivefold by 2030, this idea being presented at National Energy Basic Plan (2008-2030)(Park et al. 2011). We aim to understand

the transition in energy generation in Korea by focusing upon civil society. In particular, our research clarifiessocial process in which wind farms are accepted to be constructed at local villagesin Jeju Island. The island being located at southernmost partof Korean peninsula and famous for a tourist destination in Asia, it has become a mecca for wind turbine construction in the country. 62 wind turbines are currently installed in the island; and several construction proposals particularly for offshore turbines are waiting for local government's approval. In terms of production capacity wind turbines in Jeju Island accounts for a quarter of the total production capacity generated from the entire turbines installed in Korea.

Locating wind turbines in a local place has beendiscussed in the literature as an issue of NIMBY (Not In My Back Yard)-ism.NYMBY-ism wasidentifiedas the single greatest barrier to wind project investment (Stefanovich 2008). The NIMBY attitude indicates that even if people consider wind energy as a desirable source for electricity generation, they do not want for wind farms to sit at their neighbors (Jessup 2010; Warren et al. 2005; Woods 2003). Also, tensions among bureaucrats, scientists and environmental activists were observed reflecting different valuesover wind farms (Etherington 2009).However,it should be noted that NIMBY attitudesshape variably among people depending upon temporal, physical, social, visual, and economic effects that wind farms present to people.Our study sheds light on a successful story of wind farm siting in Jeju Island. Contrast to previous findings that report local resistance to wind farm construction, local opposition has not surfaced in Jeju Island. We present two case studies that showcase PIMFY (Please In My Front Yard)-ism and evidence the importance of economic factor in a form of compensation benefits granted to locals for attracting support for wind energy investment. The local context of two case studies was highlightedspecifying socio-economic, socio-cultural, and historical background of the case study places in particular and of Jeju Island in general. Before presenting thestudy, we reviewed factors that influence locals' attitudestowards wind farm construction in their yard. We then outline socio-economic context of wind energy development in Korea, which is followed by our case study. The paper is finalized with discussion remarks that emphasize the importance of local economy situation that leads to support for wind energy project.

Factors that Structure Local Attitudes towards Wind Farm Construction

In general,people consider renewable energy as a desirable choice to achieve an environmentally friendly society. However, once their neighbors are involvedto be a tentative wind farm construction site, they show negative attitudes to the proposal by considering the farm as a nuisance facility and as a risky object invading their everyday lives. The phenomenon is known as NIMBY syndrome. This is observedin the case of LULUs (Locally Unwanted Land Uses) (Freudenburg et al. 1992); and construction of the following lists of facilities often causesNYMBY attitudes: energy generators, hospitals, crematoriums, prisons and incinerators. However, it is argued that the concept of NIMBY does not stand clear-cut enough to capture broad range of residents' manifested objection, which is structured in a complex context (Bell et al. 2005; Luloff et al.1998; van der Horst 2007; Wolsink 2000). Trainor (2006), for example, demonstrated that a web of value system is complicated

among people who do not concur to each other over designating the site of Grand Staircase-Escalante National Monument in Southern Utah (USA) and its management styles. 10 values were identified in this dispute, which differentiate locals' attitudes. The values are: aesthetic, cultural, economic, ecosystem, historical (heritage), moral, recreational, religious(spiritual), scientific and social (Trainor2006: 18).Thus, this indicates that NIMBY attitude towards wind energy project also needs to be analyzed in more detail by clarifying contexts of local resistance.

Warren et al.(2005) characterized NIMBY-ism over wind energy investment asa 'Green on Green' issue. In their saying: "a foretaste of environmental debates to come to society has gone (at least in its rhetoric), but what kind of greenness do we want?"(Warren et al. 2005:854; emphasis added). Environmentalists advocate for wind farm construction with their green energy credential; however residents oppose it drawing upon rationales of possible negative impacts on their lands brought by turbine installation. It is an ongoing value conflict between vision for environmentally friendly societyand vision for livelihood, landscape, nature and local economy held by local people. Societal, economic and environmental values held by residents toward land shape attitudes toward wind farm siting. Four factors are discussed in the literature that aresignificant in structuring people's attitudes to wind turbine construction: time for awareness of wind farm siting;physical, social distance to wind farm siting;economic benefit reception; and perceived landscape effect caused by wind farm siting.

Timefor Awareness of Wind Farm SitingNIMBY attitude takes a shape depending on whether a wind farm siting is at planning phase or operational (van der Horst, 2007; Warren et al; 2005). Local people would not oppose a siting plan before they are aware of the plan; however once they are informed of the plan, strong opposition movement is likely to follow against the construction. Nevertheless, once turbines come to operate, NIMBY attitude tends to begradually diminishing.

Physical, Social Distanceto Wind Farm SitePhysical distance from a wind farm to individual's home is a decisive factor in shapinghis/her attitude to the wind farm siting (Devine-Wright 2005). Those who live closest to the farm are expected to show strongest NIMBY attitude. However, Devine-Wright (2005) pointed out the importance of social distance to wind farm siting as follows:

"Explanation of wind farm perception must go beyond purely physical parameters, such as proximate distance, turbine size and color, to encompass 'social' distance measures affecting the personal salience of a wind farm and are likely to prove important in explaining negative wind farm perceptions"(Devine-Wright 2005: 130; emphasis added).

As an example of social factor, Devine-Wright presents opinions held by significant others such as friends and family members living in the same local area. It is suggested that social distance could be a more decisive factor in determining NIMBY attitude than physical distance to wind farmsite.

Economic BenefitReceptionBell et al (2003) suggested that three measures are possible in handling with NIMBY attitude: legal, educational and financial. The first measure refers to an authoritarian solution involving legal treatment like NIMBY Bill in the Netherlands; and the second is to promote a more effective sense of environmental citizenship through education. The third refers to financial compensation strategies. Depending upon types of benefits

residents receive from wind farm developers, the strategy consists of two subordinate measures: individual based financial compensation and community owned benefit. The former draws upon the logicthat 'principle is for sale at the right price (Bell et al. 2003:473) or 'maybe in my backyard, if the price is right' (Loloff et al 1998:84). This attitude is often conceptualized as YIMBY (Yes InMy Backyard), PIMBY (Please In My Back Yard) and PIMFY (Please In My Front Yard). This type of attitude emerges when wind turbines are regarded as a new source for income generation. On the other hand, 'community owned benefit' measure is known as Danish model. The Danish government succeeded in promoting wind energy by introducing local ownership as a premise for tax returns and subsidies (Christensen and Lund 1998). In one word, willingness to accept a wind farm construction proposal depends on what kind of compensationspeople receive from wind energy developers.

Perceived LandscapeEffectThe visual impact of wind farms on landscape is considered among most influential factors for predicting NIMBY attitude. People's decision to support or to oppose a project often comes from perceived visual impact of wind turbines. In a case study involvingmountain area of Watauga County in Appalachian highlands Groothuis et al. (2008) found out that individuals who perceive wind energy as a clean source require less compensation; on the other hand, those who purchased land to enjoy their lives after retirement and individuals who have ancestors from the area demand high compensation to accept the plan. In addition, perceived aesthetic value of wind turbines strongly influences people for an attitude formation(Wolsink, 2000; Warren et al. 2005). Some studies identified a possibilitylink of a wind farm to be a tourism object (Jobert et al. 2007; Cass et al. 2010). Ina comparative study involving two French and German cases respectively,Jobert et al. (2007) pointed to the connections of wind farms to tourism. They reported that tourism representatives in one French case expressed concern about negative effect of wind turbines on the authenticity of their land. However, in another French case and two German cases local people showed positive attitude toward wind farms. One reason is that they integrated wind farms into tourism concept: windenergy park.

SummaryPeople's attitudes to wind energy project is defined as NIMBY-ism in terms of rejection to wind farm construction in their neighborhood. However the attitude is differentiated into diverse spectrums reflecting people's different interests and values over wind farm construction. While temporal and physical dimensions of wind farm construction are significant to predict NYMBY attitude, benefit granting in a form of compensation can reduce NYMBI attitude and turn into PIMFY attitude after all. Perceived landscape effect relates to tourism in both positive and negative ways.

Wind Energy Development in Korea

Renewable energy project consists of important part of Korea's green growth policy. Korea's energy supply relies upon energy import, which accounts for 97 per cent of the total energy consumed in the country (Jeong and Walker 2011). This creates unstable energy supply system and is vulnerable to change at international energy market. Wind energy development is considered a key measure to overcome the energy dependency by capturing wind in national territory with brand new wind turbine technology that is developed domestically. In addition, it is expected to boost national economy by selling wind turbine

technology overseas, this expressing the idea of green growth. Korean government stated that its aim for the share of global market in renewable technology is 10 per cent in 2020.

New and renewable energy sources are targeted to be 5 per cent in 2011 for primary energy consumption. Of the total generation (20.5 TWh) by new and renewable sources in 2011 wind energy is expected to provide the largest contribution, which is up to 25 per cent or 5.2 TWh. In line with this, production capacity from wind has shown significant growth. In 2002 the installation capacity is 16MW; it rocked up to 176 MW in 2006 and 406 MW in 2011 (The wind power database 2013). At the end of 2009 Korea ranks 27th in the world in terms of total installed wind capacity, with 348 MW installed (IEA 2008, recited from Lewis 2011: 290). There are 34 wind farms constructed in Korea at the end of 2011 with a total installation capacity of 406 MW (The wind power database 2013). The Korean Wind Industry Association estimates Korea's theoretical onshore wind resource potential at about 369 GW, with 18.5 GW of technical potential. Its offshore potential is estimated at 309 GW, with 31.4 GW of technical potential at an average depth of 20m (recited from Lewis 2011: 291). There are currently 8 GW of offshore wind projects either under development or in the planning states (IEA 2008, recited from Lewis 2011).

Korean firms entered the wind industry in 2006. Nine firms have played as a major developer for wind turbine technology and also wind turbine construction. They are: Daewoo, Doosan, Hyosung, Samsung, Hyundai, Hanjin, STX (formerly Sangyong), Rotem, and Unison (Lewis 2011: 290). The Korean wind industry focuses upon developing advanced wind power technology and particularly offshore wind technology, this targeting overseas market. Due to less potential for domestic market Korean company of wind industry aims to sell their technology and products overseas. Unison built a factory even in China to compete with the Chinese for the turbine market in China (Williamson 2011).

Wind Farm Construction in Jeju Island

The history of Jeju Island is full of tear and big sigh because it is the history of fighting against wind. Without understanding wind of the island you cannot talk about what Jeju is like. Halla Mt which observes the routes where typhoons pass sees wind blow never stopping all the year along. Big and small wind brings an ordeal upon any kinds of living things. Human beings are not exempt from it. <"The story that moves along with wind" from an exhibition note at Kim Young-Ghap gallery located in Jeju Island; the English translation is made by Shin-Ock Chang>

A Brief History

As photographer Kim Young-Ghap observed, wind is an essential thing in understandingthe life in Jeju Island. Wind in Jeju has been a metaphor for harsh life with tear and big sigh for islanders. It is an intimidating force for livelihood activities such as fishing, farming, and cattle ranching, and colleting seafood under the water. However in the 21st century Jeju wind is presenting a new dimension to islanders' life. It is becoming a largest income source through compensation arrangement for the villages where wind turbines are planted; and an emerging profitable business item for private company such as Samsung and Doosan. In one word, the 21st search for alternative energy source has turned island's wind into a profitable source for gold making business.

Jeju Island has been selected for a proper site for wind farm construction based upontwo

reasons. Wind farming project being a national government's green growth policy implementation measure, there is a shortage for land developmentin the mainland (Lewis 2011). Therefore, coastal areas are preferred and Jeju Island's coastal line is chosen for this. Secondly the wind that is blown in Jeju Island has proved good quality for wind energy development (Ko et al. 2010). Jeju local government has supported the installation of wind power plants on the island, having set a target for 500 megawatts by 2020, including 300 megawatts from maritime wind power (recited from Lewis 2011). Electricity from wind currently accounts for 3.4 per cent of power demand for the island's population of approximately 560,000, but the government aims to increase the figure to 20 per cent by 2020, and 50 per cent by 2050 (Lewis 2011). Jeju accounts for a quarter of production capacity of wind turbines installed in the entire Korea: 107 MW out of 406 MW.

It is in 1980 that Jeju Island first became a venue for wind turbinesiting (see Table 1). The original 4 kilowatt wind turbines (imported from Australia) provided electricity for 12 householdsin 4 villages in the island (Miller 2009).In 1997 commercial wind farm was established in hangwon village for the first time in Korean energy history following a demonstration wind energy project made in the village in 1995(Moule 2010). The first entrance of private company into wind energy development was made in 2003. Korea Southern Power Co. Ltd took the ground by building 4 turbines in yongsuvillage. The company has since built 15 turbines further (see Table 2). In 2012 first offshorewind farm construction took place off the coast of the west side of the island.In the meantime, a key institutional change in Jeju Island's wind energy development is made involving the establishment of Jeju energy development public enterprise. In 2012 the enterprise took a shape reflecting voices from the islanders that demand more active involvement of islanders in wind energy developmentand more benefit guaranteed to return to islanders (Kim 2012).

Table 1 Key events regarding wind turbine siting in Jeju Island: the year 1980 to 2012

The year	Events
1980	4 kilowatt wind turbines provided electricity for 12 households in 4 villages in the island.
1995	Wind energy demonstration project took place in hangwon village
1997	The very first commercial wind farmof South Korea was establishedby Jeju provincial government in hangwon village.
2003	Korea Southern Power Co. Ltd being the first private power company to develop wind turbines, itconstructed 6 megawatts of wind farm facilities in yongsuri.
2012	First offshore wind turbines are under construction along doomovillage and panpovillage
2012	Jeju energy development public enterprise was established.

There are 11 wind farmsin Jeju Island with 62 turbines currently working as of 2012 (see Table2). The production capacity of the wind farms installed is 107 megawatts. 1 turbine has a production capacity of roughly 1.7 MWs. Four farms are owned by Jeju provincial government whereas seven farms are owned by private company such as STX Energy Co. Ltd. Samdal wind power plant owned by Hanshin Energy Co. Ltd generates 33 megawatts, this being the greatest capacity of energy production among the 11 farms.

Out of 62 wind turbines installed onshore (opposite to offshore) 23 turbines are

constructed along the coastal line and 39 turbines are located inland. Construction from the beginning phase until 2005 was first made coastal line; and later inland. From 1997 to 2005, 20 wind turbines were installed; 42 turbines were afterwards added until 2010.

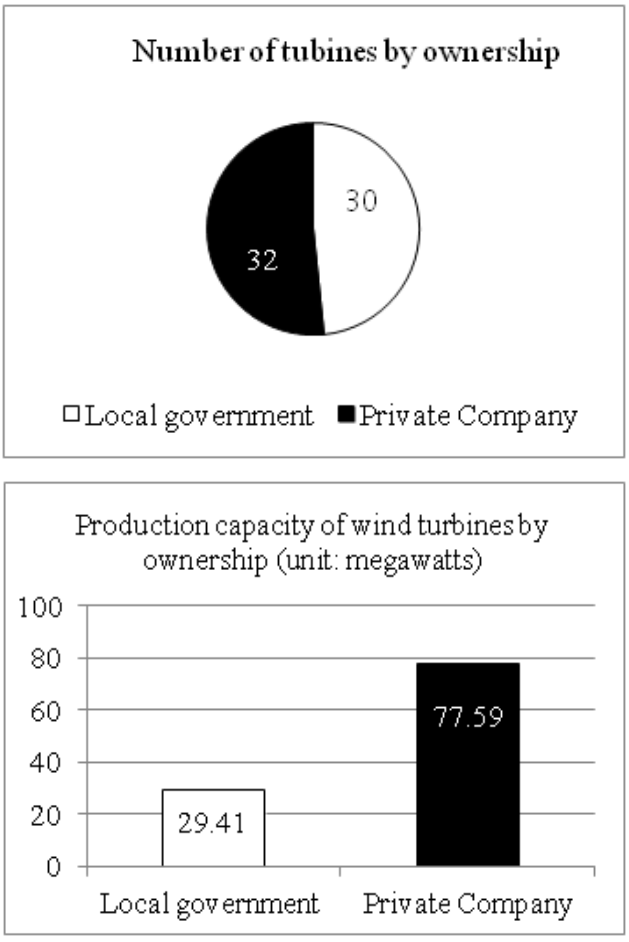
In February 2013, 4 wind farm construction proposals out of 6 wind farms (with 146 MW production capacities) were further accepted. Private companies such as SK, GS Construction and Hyundai Fund, Doosan, and Chungboo Power Co. Ltd are the developers of the projects accepted.

Table 2 Wind farms constructed in Jeju Island as of 2012

Developer	Name of wind farm	Location[1]	Production capacity	Number of wind turbine	Commencement year of operation[2]
Jeju province government	Hangwon wind power	Gujwaeup Hangwonri*	11.21 MW	13 turbines	August 1997
	Sinchang wind power green village	Hangyungmyeon Shinchangri*	1.7 MW	2 turbines	April 2005
	Gymnyeong Kuksanwha wind power	Gujwaeup Gymnyeongri*	1.5 MW	2 turbines	November 2008
	Gashiri Kuksanwha windpowe r	Pyosunmyeon Gashiri**	15 MW	13 turbines	December 2008
Korea Southern Power Co. Ltd	Jeju Hangyung windpower	Hangyungmyeon Shinchang Yongsuri *	6 MW	4 turbines	June 2003
		Hangyungmyeon Shinchang Yongdangri**	15 MW	5 turbines	November 2006
	Seongsan windpower Stage One	Seongsaneup Susanri**	12 MW	6 turbines	April 2007
	Seongsan windpower Stage Two	Seongsaneup Susanri**	8 MW	4 turbines	January 2010
Korea Institute of Energy Research	Jeju Waljeong wind power plant	Gujwaeup Waljeongri*	1.5 MW	1 turbine	December 2005
Hanshin Energy Co. Ltd	Samdal wind power Plant	Seongsaneup Samdalri**	33 MW	11 turbines	March 2007
STX Energy Co. Ltd.	Wollyong STX wind power plant	HalimeupWollyongri*	2 MW	1 turbine	July 2009
Total	11 wind farms		107 MW	62 turbines	

Source: Department of Smart Grid, Jeju Provincial Government, 2012.
Note: [1] * located coastal line; ** located inland; [2] The number of wind turbines suggested in the table is not necessarily prepared at the commencement year of construction.

Figure 1 Distributional pattern of wind farms in Jeju Island by ownership



By ownership, the installation pattern of wind turbines in the island presents the following characters (see Figure 1). Jeju provincial government owns 30 turbines whereas 32 turbines are owned by private enterprises. In terms of production capacity of wind turbines those owned by private company has much greater production capacity than local government owned turbines: They are 77.59 MW compared to 29.41 MW.

The wind turbine installation history now entered the 3rd ground presenting construction of maritime turbines. As of 2012, 10 wind turbines (with 30 MWs capacities) are being constructed

in the middle of seawater off the west coast of the island. Doosan Company is in charge of the construction project.

Case Study

This section introducestwocase studies. We will detail twowind farm cases focusing upon the process of wind turbines to be sited in a village. By this we will make a case for PIMFY-ism.The two sites were chosen for case study considering their larger number of wind turbines than other wind farms. The two in total number 24 turbines, this accounting for a third of the entire wind turbines installed in Jeju Islandas of 2012 (see Table 2). In addition, each of them represents different types of ownership and different geographical location as well. Hangwonvillagepresents government ownership being located along the coastal line whereas the case of samdalvillage presents private company ownership and inland location. In addition, hangwonvillage wind farm is the largest among those owned by the Jeju government; and samdal village wind farm is also the samefor privately owned.

In order to collect information as to locally involved process, we interviewed leader of the two villages in December 2012. The interview took 81 minutes with hangwon village leader; and 65 minutes with samdal village leader. Figure 2 shows the location of the two case study sites in Jeju Island.

Case 1: Samdalvillage wind farm Samdalvillage locates at south east part of Jeju Island (see Figure 2). It is 36 kilometers away from Jeju city when travelling across inland; and located inland away from the coastal line. Ranchers and farmers are the key players for the local economy. Ranchers raise: horses, pigs, and cows; Farmers cultivate: kiwi, radish, potato, carrot and orange. These two livelihood activities are practiced generation and generation in this village. However they are getting less visible with gradual decline in economic turnout. Infrastructure for tourism industry has been established by mainlanders and private company. A tourism complex – called illuchulland – was built featuring a cave in this village by private company in 2001. Also holiday accommodations have been built by people who came from the mainland.

Figure 2 The location of case study sites

Source: A map of Google; Aindicating samdalvillage and B hangwonvillage

In 2005 when Youngjoo Wind Tech – this later changing a name to Hanshin Energy Co. Ltd – proposed the village a wind farm construction in their land. It took over 1 year for the developer to complete building 11 Danish turbines once the proposal was accepted by local people. The construction was made in the hill of samdal village (see Figure 3). The hill is back dropped with several small volcanic parasites (called orum in local dialect); and pastoral land and agricultural farms are located nearby. However it is far away from residential place. Business for selling wind energy generated from the turbines took off in 2009 according to village leader.

[2]The business commenced in 2007 according to the document provided by the Jeju government

Figure 3 Wind turbines located inland at samdalvillage

Source: Photos taken by Shin-Ock Chang

6 turbines are sited in communally owned land by ranchers' association of the village, which was formed in 1923. Another 5 turbines are sited in land which the developer bought for this project and in private land owned by individuals in the village. This influenced the way of compensation arrangement to be implemented.[1]The compensation money is used for development projects of the village such as for: elderly residents' welfare; funeral services; and scholarship support for students from the village. Also the money is used for constructing buildings for a common use among village residents. The utilization way of compensation contrasts to hangwon village in which individual allocation was made (for details, see case study for hangwonin the below).

When the village was offered a wind turbine site,unanimous support was not made instantly. The village leader mentioned this in terms of insufficient information exposed to villagers. The local discordance sat at dealing with the issue of compensation benefit from the wind turbine developer. Local opposition being minor, a key line of opposition concerns likeable difficulty in livelihood activities caused by wind turbines. Ranchers and farmers expressed this concern. However after further deliberation process, they accepted the project as an alternative to their activities that have seen decline in economic output.

Strong opposition is rather made by people who come from the mainland. The mainlanders are owners of holiday accommodations and land in samdal village. They opposed the construction arguing that their land value would be negatively affected. Several public demonstrations were held by all the different parties. A sign post that was held by the residents of samdalvillage in their press conference at local government says: wind turbine business is the business of village; take hands off on this, the third parties! The slogan made it clear that a wind farm developer and village residents are in agreement over introducing wind turbines into the village hills where wind turbines are to be located.

Samdalvillage leader expressed willingness for hosting more turbines in the future. However it will take a different form from the beginning. Village itself will join a project from initiated phase as an active negotiator with a developer. The selling price of electricity produced from wind turbines has significantly increased since the business took place in 2009. However the increased profit did not benefit the village in

[3]The village receives approximately 120,000 US dollars per year for renting the land owned by the ranchers' association; and extra 45,000 dollars for those five turbines planted in privately owned land. Private land owners themselves receive money on an individual basis.

return. This raised uneasiness among locals.

[4]In the future local participation is more actively emphasized from the beginning; and local people can become an active player in shaping the direction of wind energy development project that takes place in their village. After all it will take a form of village business in a partnership with private company in the future. The village leader said:

"We want to play more actively in this wind energy development project. We do not want to just let our land to be used for profit making business by private company and simply receives compensation for it. We want to be more part of the project rather than bystander".

Case 2: Hangwonvillage wind farm Hangwonvill age locates coastal line at the north east part of Jeju Island (see Figure 2). It is 30 kilometers away from Jeju city. 700 people who are native to the village reside in the village; and another 300 people, outside comers, account for other population group in the village. Agricultural and fishery activity are the two major income generating sources for villagers; andfishers, women divers, and farmers are the key players for the village economy. Fishers catch: damselfish, yellowtail, hairtail, squid, and tilefish; women divers collect under the water: seashells, sea urchin and seaweeds. Farmers grow: carrots,garlics, potatoes, and beans. Unlikesamdalvillage, tourism infrastructure has not been established.Instead,industrial complex of agriculture andaquaculture are found in this region.

Hangwon village is very well known spot in Jeju Island for strong wind all the year along. The plenty of wind presents a challenge for survival activity such as fishing and farming. Particularly the soil for agricultural activity is futile and sweeping wind brings beach sand to agricultural land, which makes more difficult agricultural products to grow. The economic output from agricultural activity is not impressive. Strong wind presents ordeal for women divers as well especially during winter time for diving work. Also fishers find strong wind challenge while they work in the sea. Hangwonvillagewas one of the poorest part in Jeju Island. However, societal transformation in the 21st century that seeks for alternative energy source has turned hangwoninto the mecca of wind energy center not only in Jeju Island but also in entire Korea.

Figure 4 Wind turbines located in the coastal

Source: Photos taken by Shin-Ock Chang

[4]Particularly local environmental groups have been active in promoting the concept 'ecological inequality' for wind energy development project in Jeju Island (Kim 2012). They argued that benefit from wind energy development should be communally owned rather than benefiting only private companies. This discussion contributed to the establishment of law that guarantees active local participation of local people in Jeju Island in wind energy development project. In addition, energy development public enterprise of Jeju government was also set up, which is to be in charge of wind energy development project in Jeju Island.

In 1995 the construction proposal was made to hangwonvillageby local government. Local government of Jeju Island established “Jeju Hangwonwind Farm” in 1997. The farm has grown to include 15 generators, which from 1998 to 2008 produced 15 megawatts of power, worth 10 billion Korean won in profit (Miller 2009). 5 turbines are installed by local government affiliated company between 1995 and 2000. Another 6 turbines are installed by private company (Doosan, Hyosung) between 2001 and 2006. 4 turbines were replaced with new one after an accident in 2009 in which one turbine fell down to the ground with fire flame. The accident was caused by inefficiency for controlling turbines during heavy wind-blow. The construction of 20 offshore wind turbines was proposed by Doosan Company in 2012; and it is waiting for permission from the Jeju government. In May 2010 smart grid complex that advertises new and renewable energy system opened in the wind farm area. This is a ground breaking building that shows the connection of production and consumption through renewable energy system. This is the only one so far built in Korea.

According to the village leader, village residents expressed three concerns regarding wind turbine sitting plans: (1) intimidating outlook of turbines; (2) noise disturbance from spinning of turbines; (3)interruption of agricultural activity with shadows made by gigantic size of the wing of a turbine. People who expressed the concerns were consulted and persuaded over the compensation benefit that would exceed their income from their traditional livelihood activities. Unlike samdalvillage wind farm,hangwon wind farm locates near to the residential place of the village.

The village receives approximately 30,000 US dollars per turbine for compensation a year. 1.4 per cent of electricity invests also returns to the village. With passing of the law that ensures empowering local agency in wind energy development, amount of compensation is expected to increase. What is more, local village will take a more control in bargaining with wind energy developers. The village can choose developers that give more benefit to village. Unlike samdalvillage, hangwonvillage allocated compensation benefit among members of the village on an equal basis.

Discussion

“Wind could become an important new ‘crop’ for rural areas, and wind farms may come to represent a new cultural landscapes for the early 21st century” (Warren et al 2005: 872).

The aim of the paper has been to clarify the successful story of wind farm construction in the lands of rural and fishing community in Jeju Island. As Warren et al. (2005) pointed out wind for these two areas has become a new crop that yields income for their livelihoods. Once wind was a life threatening force for their livelihood activities, it has turned to be a life supporting base in the 21st century. Social science literature of wind energydevelopment suggests that siting wind turbines is the issue of NYMBY-ism. However the two cases presented in this paper suggest the opposite fact. It is a PIMFY issue. Local resistance to wind turbine installment proposals has hardly been observed in Jeju Island. Rather, many villagesin the island are now eager to introduce wind turbine in their place. Why? Turbines bring money to a village for compensation for using their land. The compensation exceeds their income from fishery and agricultural activities that are traditional life supporting bases. The two village leaders we interviewed expressed their satisfaction in hosting wind turbines in

their village and one village leader expressed his willingness to introduce more turbines if possible. Both leaders consider the future of their village in terms of economic benefit from wind turbines is bright and satisfying.Village wind has now turned into a major source forvillage business, which came with the 21st century's aspiration forsafer and cleaner energy source. With the institutionalization of Jeju energy development public enterprise an active participation of local people is to be more emphasized and guaranteed. In other words, wind has turned to a medium through which local village exercise power by negotiating with wind turbine developers.

Contrast to facilities such as nuclear power plants, manufacturing factories, cemeteries and chemical waste facilities, socially created meaning of wind turbines as a material facilityis not negative. It is considered to bring electricity through cleaner and safer production process. Particularly it is considered an alternative energy source for petrol and nuclear power. In Japan locally organized movement has been successful in hosting wind turbines in a local region expressing the idea of 'local energy sovereignty' (Hasegawa and Broadbent 2008). However countries like the UK, USA, and Sweden the opposition from residents make it difficult to launch wind turbines in a local place. As we have reviewed, the main reason for residents' opposition is concern about land value to decline; and concern about interruption and annoyance in everyday life by wind turbines in terms of landscape view and nuisances. These concerns were also raised in our cases. However while local residents were persuaded with a compensation benefitover these concerns, mainlanders who own land in the study places are more resistant to wind turbine siting. Therefore the dividing line was made between mainlanders and local residents. Mainlanders who own land,run holiday facilities for business, and who own organic vegetable farms maintained NIMBY attitude whereas islanders supported the siting plan in the long run. Also as found in the study of Jobert et al. (2007) wind farms in our case study places have turned to be a touristic site. It is advertised something 'new'and 'exotic'to see and experience in national media of tourism (e.g. official site of Korean tourism). Local hosts that are shown in our case study also expressed the possibility of attracting tourists towind farms and its annexed complex. Indeed they have seen the arrivals of visitors in a group tour to smart grid complex and the wind farms[5].The village leaders never mentioned possibility of destroying the view by wind turbines of coastal line and small volcano parasites, which can be considered of tourism assets.

Our study suggests that situation of local economy can be a factor to shape local reactions to wind turbine siting proposal. Jeju Island in Korean development context has long been a place of isolation and underdeveloped (Chang 2012). When South Korean economy transformed into manufacturing based industry (from primary industry) in the late 1960s Jeju Island remained at primary industry in which local people practice fishery, agricultural, and cattle ranching activities. This legacy has left the island poor compared to mainland, particularly major cities where manufacturing industrial bases were successfully established. Establishing wind farm infrastructure that includes wind turbine machines and technological apparatus in Jeju Island therefore means the birth of industrial age, which islanders hardly experienced before. The

[5]The turning of wind turbines into visual products is indicated by the business card of the hangwon village leader we interviewed. It says: beautiful village of windmill,Hangwon.

industrial age that was enjoyed by mainlanders while producing manufactured goods such as refrigerators, TVs, and shipshave brought them economic benefits. The economic gap between mainland and Jeju Island has been wide as the economy of the two places draws upon different bases. The support among local people in Jeju Island for wind turbine construction thus can be read as a struggle for getting out of poverty that they have suffered until now. The PIMFY attitude is considered more reasonable approach by locals because the traditional life supporting activities such as fishing and agricultural activity are now waning due to the destruction of the bases of the activities in a form of negative marine ecosystem change (Chang 2012). These were echoed in the voices of the two village leaders we interviewed. Therefore wind turbine construction in Jeju Island has more economic dimension than environmental. With traditional life supporting activities declining, local people need new income source for their livelihood. Wind turbines in the island are thus a new life supporting base for islanders in the 21st century.

With the institutional support of the central government and the willingness of the Jeju government, wind farm construction project has seen great upsurge in Jeju Island for the past 10 years. It appears that wind farm construction boom will never fade in the island. The economic output that has turned out profitablefrom selling electricity through wind energy generation is attracting more other private companies such as SK and GS in wind turbine business. With continuing involvement of private companies in wind energy development in Jeju Island, the issue in the future will take a shape in a way:how much benefit a local people can secure from private company (Ko 2013); and how local government would behave in mediating between local profit and private company's profit. The current situation in wind energy development in Jeju Island certainly asks for more social scientific research. By looking into a specific local context that is formed historically and socially over wind farm construction, our research clarified the importance of economic situation that brings out support for wind farm construction. However it should be cautioned that we were only informed of a village leaderand newspaper materials about locally involved process.Further study should include voices from residents for detailed context for local support.

Author's Biographical Note

Shin-Ock Chang is Research Professor based at the World Environment and Island Institute at Jeju National University, South Korea. She obtained her PhD from the University of Queensland (Australia). Her major research interests are: wind energy development and fishing community response to marine ecosystem change, this focusing upon Jeju Island.Atsushi Nozawa is a PhD Candidate at Graduate school of Arts and Lettersat Meiji University, Japan. His main research interests are: wind energy development, and Japanese welfare system for environmental victims such as minamata disease victims and refugees from Fukushima nuclear accidents.

Bibliography

Bell, D., T. Gray and C. Haggett.(2005)"The 'Social Gap' in Wind Farm Siting Decisions: Explanations and Policy Responses",Environmental Politics, 14:460–477.

Cass, N., G. Walker, P. Devine-Wright. (2010) "Good Neighbors, Public Relations and Bribes: The Politics and Perceptions of Community Benefit Provision in Renewable Energy Development in the UK", Journal of

Environmental Policy & Planning 12(3): 255-275.

Chang, S-O. (2012). “Environmental Discourses of Fishers on Seawater Change: ACase Study of Jeju Island, South Korea”, Journal of Subject Matter, 6 (1): 143-165.

Christense, P. and H. Lund.(1998) “Confliction Views of Sustainability: The Case of Wind Power and Nature Conservation in Denmark”, European Environment 8: 1-6.

Devine-Wright, P. (2005). “Beyond NIMBYism: Towards an Integrated Framework for Understanding Public Perceptions of Wind Energy”, Wind Energy 8:125-139.

Etherington, J. (2009). The Wind Farm Scam, Stacey International.

Freudenburg, W. R. and S. K.Pastor. (1992).“NIMBYs and LULUs: Stalking the Syndromes”,Social Issues 48(4): 39-61.

Groothuis, P.A., Groothuis, J. D. and J.C.Whitehead. (2008). “Green vs. Green: Measuring the Compensation Required to Site Electrical Generation Windmills in a Viewshed”,Energy Policy 36:1545-1550.

Hasegawa, K. & J. Broadbent. (2008) “Locality, Idealism and Profitability as Triggers in Green Energy Movements”, Apaper presented at 7th world wind energy conference, 24-26June, St Lawrence College, Ontario, Canada.

Jeong, YJand G. Walker. (2011). “Motives and Meanings of Renewable Energy Projects in South Korea”, Paper presented at the conference, Energy and People: Futures, Complexity, and Challenges, Oxford, 20-21 September 2011.

Jessup, B. (2010). “Plural and Hybrid Environmental Values: A Discourse Analysis of the Wind Energy Conflict in Australia and the United Kingdom”, Environmental Politics, 19 (1). 21-44.

Jobert, A., P. Laborgne, and S. Mimler.(2007). “Local Acceptance of Wind Energy: Factors of Success Identified in French and German Case Studies”,Energy Policy 35: 2751-2760.

Johnson, A and S. Jacobsson. (2000). “The Emergence of a Growth Industry:AComparative Analysis of the German, Dutch and Swedish Wind Turbine Industries” A paper presented at the 8th Joseph A. Schumpeter Society conference ‘Change, Development and Transformation, University of Manchester, UK (28 June to 1July).

Kim, D-J. (2012). “A Discourse on Communalization of Wind Energy Resources at Jeju”, ECO: The Korean Journal of Environmental Sociology (in Korean), 16 (1): 163-204.

Ko, KN, K.B Kim, J.C. Huh. (2010)“Variations of Wind Speed in Time on Jeju Island, Korea”, Energy, Pp. 3381-3387.

Lewis, J. I. (2011). “Building a National Wind Turbine Industry: Experiences from China, India and South Korea”, International Journal of Technology and Globalisation, 5 (3/4): 281-305.

Luloff, A.E., S.L. Albrecht and B. Lisa.(1998). “NIMBY and the Hazardous and Toxic Waste Siting Dilemma: The Need for Concept Clarification”. Society and Natural Resources. 11: 81-89.

Mostafaeipour, A. (2011). “Productivity and Development Issues of Global Wind Turbine Industry”Wind Turbines, Ibrahim Al-Bahadly (ed). Pp. 25-50.

Park, Y-C, D-S Kim, J-C Huh, and Y-G Kim. (2011). “New and Renewable Energy Policies of Jeju Island in Korea” A paper presented at World Renewable Energy Congress, pp. 2446-2453, 8-13 May 2011, Linköping, Sweden.

Stefanovich, M-P. (2008). “NIMBY-ism and Wind Power: What Have We Learned So Far?”, online website (http://fletcher.tufts.edu/CIERP/News/more/~/media/Fletcher/Microsites/CIERP/

NIMBY_PPT_TUFTS.pdf) (accessed 25th June 2013 accessed).

The Wind PowerDatabase.(2013) “Wind Turbines and Wind Farms Database for the world and South Korea”, online website (www.thewindpower.net) (accessed 13th February 2013).

Trainor, S.F. (2006).“ Realms of Value: Conflicting Natural Resource Values and Incommensurability”, Environmental Values, 15: 3-29.

van der Horst, D. (2007). “NIMBY or Not? Exploring the Relevance of Location and the Politics of Voiced Opinions in Renewable Energy Siting Controversies”,Energy Policy 35:2705-2714.

Warren, C. R., C.Lumsden, S. O’Dowd and R. V. Birnie (2005). “‘Green On Green’: Public Perceptions of Wind Power in Scotland and Ireland” Journal of Environmental Planning and Management, 48 (6): 853–875.

Wolsink, M. (2000).“Wind Power and the NIMBY-Myth: Institutional Capacity and the Limited Significance of Public Support”, Renewable Energy 21: 49-64.

Woods, M. (2003). “Conflicting Environmental Visions of the Rural: Windfarm Development in Mid Wales” Sociologia Ruralis, 43 (3): 271-288.

Newspaper sources

Williamson, L. (2011). “South Korea’s Drive for Renewable Energy”, BBC, online site (published 1 Dec 2011; Oct 2012 accessed)

Breidthardt, A. (2011) “German Government Wants Nuclear Exit by 2022 at Least.” Reuters, online newspaper in English language (31stMay 2011 published; 22th June 2013 accessed)

Miller, M. (2009) “Catch the wind: Jeju people embrace the ever-present force of nature” The Jeju Weekly, online newspaper in English language (18th July2009 published; 17th October 2012 accessed).

Moule, C. (2010) “Harnessing the wind: Jeju makes power from its plenty”, The Jeju Weekly, online newspaper in English language (12th June published; 13th October 2012 accessed).

Ko, H-B. (2013) “The Jeju government giving ’gold egg wind’ to big company”, Jeju sori, online source of the newspaper in Korean language (3rd February published; 12th February 2013 accessed).