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The Catastrophes and the Combined Failure of Institutions, Part II: A Comparison of Fukushima and Minamata*

By

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Abstract

This paper will attempt to understand how institutional failure should be detected and remedied quickly to limit the extent of damage caused by catastrophes, focusing on two significant cases in Japan: Fukushima and Minamata. Such a damage can be a manifestation of the combined failure. Also, as the causes of the cases relate to social technologies as well as physical technologies, it is necessary to adopt a trans-disciplinary approach which makes it possible to mobilize different capabilities of social and natural scientists, practitioners, and policymakers.

Keywords

Catastrophe, Fukushima, Minamata, Trans-disciplinary Approach, Combined Failure of Institutions, Business Ecosystem Governance, Corporate and Global Sustainability

Minamata Disease: II.

When they hit a snag in identifying the root cause, Douglass McAlpine, who was a British neurologist visiting Minamata, gave them a clue by indicating that the patients display symptoms resembled those of Hunter-Russell syndrome, which is organic mercury poisoning such as tunnel vision and hypacusia. In February 1959, the mercury distribution in Minamata Bay was investigated by a newly formed group merged KURG under the leadership of the Health and Welfare Ministry. As a result, a great amount of mercury was detected in fish, shellfish, and sludge from the bay. The pollution was so severe that at the mouth of the wastewater canal a figure of 2 kg of mercury per ton of sediment was measured: a level that

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would be economically viable to mine (Harada 1972). On November 12, 1959 the Ministry of Health and Welfare's Minamata Food Poisoning Subcommittee reported to Yoshio Watanabe, the Health and Welfare Minister, that Minamata disease is a poisoning disease that influences the central nervous system and is caused by the consumption of copious amounts of fish and shellfish living in Minamata Bay and its surroundings, the major causative material being some sort of organic mercury compound. However, the minister told the group to disband next day although more investigation into the causes of the disease was required.¹

The term Minamata disease appeared in the newspapers around August 1958 because consultation between the Health and Welfare Ministry and Kumamoto prefecture resulted in the name although most people referred to it as the weird disease at Minamata before that (Takamine 2004). The originality of the disease is in that it is the organic mercury poisoning that occurs through the food chain affected by environmental contamination and can cross the placenta to the fetus (Harada 2004). In particular, in August 1961, two brothers with fetal Minamata disease were found. They were born with the disease, rather than developing it by eating contaminated fish and shellfish. Although at last their existence shattered the accepted notion that poisonous substance cannot be transmitted through the placenta, the notion had prevented scholars in general and pediatricians in particular from recognizing the reality of fetal Minamata disease agilely.

Chisso set up the Fascinoma Laboratory in July 1959. The laboratory performed experiments in cats to develop Minamata disease giving them the food with 20 grams effluent from the plant a day. The experiment showed that it took 78 days to develop the disease. This is known as the result for cat 400. Thus the company hid the vital information concerning the root cause, and had some nerve to insist that the root cause of the disease would be explosive which was dumped into Minamata Bay by the military forces. Moreover, it fabricated a variety of hypotheses to reach an agreement in compensation talks with the patients at bay in its favor by fomenting disorder.²

The plant effluent with the causative substance had been still left derelict since the first patient was officially approved in 1956. At last, MITI ordered the company to stop discharging plant effluent immediately and set up facilities for effluent purification in October 1959. The company installed a Cyclator purification system, but the facility was set up to put on a front for the society and thus it was no use in getting rid of organic mercury.³ The company had discharged the plant effluent with mercury into sea before it stopped manufacturing acetaldehyde in May 1968.⁴

Chisso had slid through without a snag so far, but in February 1963, Tadaaki Irukayama, a professor at Kumamoto University, found that methyl mercury compounds, which was regarded as the major cause of the disease, included in fish and shellfish was the same as those detected in the sludge obtained at the reaction tube of the plant.⁵ This implies that Chisso revealed their true colors. However, the period between 1960 and 1968 was referred to as the "eight years of vacuum" (Takamine 2004). In fact, much activity on the part

¹See Harada (1972, pp. 50-53).

²See Harada (1972, pp. 54-57).

³Kiichi Yoshioka, the president of Chisso, drank a glass of water supposedly treated through the Cyclator to demonstrate that it was completely safe. That was just a fraud, but the Cyclator contributed to a formation of shared cognition in the society that the issues of Minamata disease were over. In summary, it produced social safety rather than physical safety as we will explain more later. For this, see Takamine (2004, pp. 135-136).

⁴See Harada (1972, pp. 57-59).

⁵See Harada (1972, p. 69).

of the patients and fishermen took place during this period but nothing had a significant impact on the actions of the company or the coverage of Minamata in the national media. In September 1968, the government issued an official conclusion regarding the cause of Minamata disease, saying that the causative agent of the disease is methyl mercury, which was produced in the acetaldehyde acetic acid facility of Chisso's factory and was discharged in plant effluent. In 1970, former factory manager Eiichi Nishida admitted that the company put profits ahead of safety.

American photographer W. Eugene Smith and his wife brought world attention to Minamata disease. They were extremely dedicated to the cause of the victims of Minamata disease, closely documenting their struggle for recognition and right to compensation. It is significant that Smith was attacked and seriously injured by Chisso employees in an incident in Goi, Ichihara city, near Tokyo on January 7, 1972, in an attempt to stop the photographer from further revealing the issue to the world. The 54 year-old Smith survived the attack, but his sight in one eye deteriorated and his health never fully recovered before his death in 1978.

As for Kumamoto prefecture, the number of the people who think that they are the patients of Minamata disease is 20,416, 1782 of which are certificated as patients of Minamata disease.⁶ Minamata Disease Certification Commission at Kumamoto determines who meets the conditions required to be a patient under Law concerning Pollution-Related Health Damage Compensation and Other Measures. However, it would be more correct to say that "no one can answer correctly the question how many patients of Minamata disease exist" (Sonoda 2011, p. 103). Next, we would like to move to the case of Fukushima.

The Fukushima Nuclear Crisis

The origin of the TEPCO goes back to 1883 when Tokyo Electric Lightning Company (hereafter, TELC) was established as Japan's first electricity company. Ichisuke Fujioka, who was inspired by the earlier establishment of electricity companies in the US and UK, contributed to the formation of the company and served as a chief engineer. In 1890, he established Hakunetsusha to engage in manufacturing electric bulbs. The bulb company is the origin of Toshiba that supplies reactors to TEPCO, which is the successor of TELC. Hence, there have been such relationships between TEPCO and Toshiba since the late 19th century.⁷

Before examining the causes of the Fukushima nuclear crisis, we need to understand the institutional characteristics of the Japanese electric utility industry in which TEPCO is embedded: regional monopoly, integration (bundling), and full cost pricing. These could be referred to as "three pillars" (Taniguchi 2012). In this respect, Yasuzaemon Matsunaga demonstrated charismatic leadership to set the evolutionary path on which the industry developed. He articulated his vision to design the development of the industry, expressed as "My View of Electric Power Regulation" in 1928. The vision prescribed the first two institutional characteristics, but incredibly these are still at work in the industry even in the 21st century when we are increasingly experiencing globalization and the rise of competitive pressure. His design aimed to enable the electricity companies to avoid cut-throat competition among them and thus supply electricity on a stable basis.

Let us explain the institutional characteristics further. After the World War II,

⁶See <http://soshisha.org/kanja/toukei.htm>.

⁷For this, see http://kagakukan.toshiba.co.jp/manabu/history/spirit/roots/ichisuke/index_j.html.

Matsunaga persuaded the GHQ (General Headquarters) to adopt his design in working out the postwar industry reorganization, a leadership role for which he was well prepared due to his experience of top management of an electricity company and his deep understanding of the Japanese electric utility industry in all its aspects, past and present (Kikkawa 2006). First, the Japanese electricity market was divided into nine regions, one of which included Tokyo was dominated by TEPCO. The system of regional monopolists has enabled TEPCO to enjoy monopolistic rents for years because there has been no rivalry in the market except TEPCO.⁸ The company does not have strong incentives to create change, but to sustain the successful system as long as possible.

Secondly, integration of power generation, transmission, and distribution was introduced in the Japanese electricity market. This makes it possible to eliminate mismatches between the demand for electricity on the basis of long-term contracts and the supply of electricity that cannot be stored and thus should be generated on a real-time basis (Takemori 2011). For electricity companies, a bundling of these activities could be a source of scale and scope economies if they are allowed to be regional monopolists. Also, the electricity companies can request high price for using their transmission facilities to users, so that these facilities could be entry barriers that enables them to avoid competition which erodes monopolistic rents over time.

Thirdly, the origin of full cost pricing goes back to 1933 when the government decided to adopt it. In 1960 the government adopted rate base pricing, which gave strong incentives to the companies to facilitate nuclear development, because the pricing implies that the more investments, the more profits. Nuclear power plants, which require billions of pounds for initial investment, become a money machine for the electricity companies.

Another thing that we have to mention here is the flying kite district, which allowed the companies to have power sources in the local region far from the urban consuming area of electricity such as Tokyo, Osaka, and Yokohama. Matsunaga had hydroelectric power generation in mind to increase the sources to meet the increasing demands for electricity in the large cities. The flying kite district came into existence in 1950, but apart from his intension, it was used for nuclear development (Taniguchi 2012). This system has made it possible for TEPCO to have Fukushima Daiichi and Daini nuclear power plants (10 reactors) in Fukushima and Kashiwazaki-Kariwa nuclear power plant in Niigata (7 reactors) even if the company supplies electricity to the Kanto region, out of which the plants are located for generating power.

Why was Fukushima chosen as a site for the construction of nuclear power plant? Zenichiro Sato, the governor of Fukushima, and Yoshie Kimura, an upper house member, were exploring ways of developing the regional economy somehow which lacked industries with the potential for development (Kainuma 2011). On the other hand, Kazutaka Kikawada, the president of TEPCO, wondered whether the company should think through or launch nuclear power generation immediately in bickering over the leadership of nuclear power with bureaucrats. Consequently, these Fukushima natives decided to build a nuclear power plant in Fukushima and managed to acquire massive land smoothly in Futaba-gun from Yasujiro Tsutsumi through personal relationship with him without facing any anti-nuclear movement. Thus at the Fukushima Daiichi, TEPCO started construction of the No. 1 reactor

⁸More correctly, the system of regional monopoly in the Japanese electricity market was stipulated in the Electricity Business Act in 1964. It can be said that the system was completed with the privatization of Okinawa Electric Power Company, the predecessor of which was established as Ryukyu Electric Power Corporation, in 1988. Thus Japan has ten regional monopolists, each of which monopolizes a local market.

in 1967 and began operating the system in 1971. Other reactors also started their operations in the 1970s (TEPCO 2002).

The Great East Japan Earthquake, with a magnitude of 9.0 on the Richter Scale, hit the country on March 11, 2011, triggering devastating tsunami. As a result, the Fukushima Daiichi, located near the earthquake's epicenter, released large amounts of radioactive materials such as iodine 131, cesium 134 and 137, and strontium into air and sea from the several reactors that had been in meltdown, and which had become a severe technological and intellectual challenge. Residents in local communities have been forced to evacuate the area, thereby depriving them of the right to go about their daily business in the way they were used to. It is impossible for them to work for local companies, access clean air and water, and play in schoolyards safely. Japan has faced an unprecedented crisis such as the world has never before experienced, in which the country has had to urgently deal with the problem of impairment of the aforementioned primary goods (Rawls 1999), as well as those of disposal of rubble contaminated with radioactive substances, food contamination, and recovery of the badly damaged local economies.

Taniguchi (2012) attempts a systematic analysis of why the Fukushima nuclear crisis occurred. First, the massive natural disaster, i.e. the 9.0-magnitude earthquake and 14 meters-high tsunami, hit the nuclear power plant. That earthquake broke a line tower to receive electricity and led to loss-of-offsite-power. This implies that, unlike the story insisted by TEPCO, the Fukushima Daiichi had already fallen into a truly critical situation in the wake of strong seismic shaking before the plant was attacked by tsunami. Thus although external power supply is of critical importance to nuclear power plant, it was not quake-resistant at all (Ohshima 2011).

On the other hand, it can be said that TEPCO paid no attention to tsunami-fighting measure or attempted to treat tsunami as though it did not even happen. The company adopted an outsourcing strategy to General Electric (GE) to build a new nuclear power plant in Fukushima by way of full-turnkey contract. This implies that it relied exclusively on GE's technologies without capabilities necessary for constructing the plant. In the 1960s it had to accept the design proposed by GE that locates emergency power system in the basement to protect from hurricane which is popular in the US. As a result, as for the reactors from No.1 to No. 6 at the Fukushima Daiichi, 10 of 13 emergency systems were located in the basement and consequently it was only one system that could avoid being submerged from tsunami. Thus the systems could not cool down the reactors.⁹

Secondly, the nuclear village has massive monopolistic power over politics and economy, which could be referred to as anti-absorptive capacity in that they do not need to learn and adapt to the environment, but it is easy for them to control the environment in the way that is advantageous to nuclear development. They sometimes send their representatives to the diet to control legislation and thus facilitate nuclear development. Additionally, they give conspicuous amount of money to mass media to control information that is available to the public because they do not want that undetected imperfection and inconvenience of nuclear power generation comes to light as this would get in the way of nuclear development. Thus safety dogma has prevailed across the society.

In Japan, nuclear development has been facilitated as national policy mainly under the Atomic Energy Fundamental Act enacted in 1955. Nuclear power business has been protected by great abundance of laws and regulations. The Three Power Source Development

⁹We owe this to *Asahi Shimbun* (June 11, 2011).

Laws enacted in 1978 gives strong incentives to local governments to allow nuclear power plant to be built in their site since this implies that the municipality will get the special subsidiaries from the government, which are paid by electricity companies as tax whose source is higher electricity price for users that would otherwise be the case. On the other hand, the Act on Compensation for Nuclear Damage enacted in 1961 indemnity liability of electricity companies in the case of nuclear accident. But it sets the upper limit of compensation at 1.2 billion yen (about 0.97 billion pound) and reparations beyond this should be covered by the government. The problem is that both laws trigger moral hazards of local governments and electricity companies, respectively. The former makes the local government unwilling to engage in innovative activities for regional development, whereas the latter renders the electricity company hesitant to pay heed to the physical safety of nuclear power plant.

Thirdly, people in the society believe in safety dogma that nuclear power plant is completely safe before the Fukushima nuclear crisis occurred. They could allocate their cognitive resources, or more simply attention, to economic activities to make a living, taken nuclear development for granted. As a result, the Japanese Archipelago is surrounded by 54 reactors (17 plants), including reactors from No.1 to No.4 at the Fukushima Daiichi which will be decommissioning. As recently reported by the *Daily Telegraph*,¹⁰ a Japanese government panel's report on the Fukushima crisis said the fundamental problem lies in the fact that utilities, including TEPCO, and the government have failed to see the danger as reality as they were bound by a "myth of nuclear safety" and the notion that severe accidents do not happen at nuclear plants in the country. The study, completed by a government-appointed panel including scholars, journalists, lawyers and engineers, also said Fukushima staff were poorly trained to deal with the crisis after the plant's reactors went into meltdown last year.

We have to record two caveats. First, most of the people believe that Masao Yoshida, the site manager at the Fukushima Daiichi nuclear power plant, who neglected instructions from the task force in order to keep on cooling down the reactors, was a hero because he attempted to prevent the reactor from worsening. However, a closer look at history gives us that this view would be misleading. In 2002 and 2008, he and Sakae Mutoh, the vice president, made decisions to set aside their tsunami-fighting measures.¹¹ They were much obsessed with earthquake, which led the Kashiwazaki-Kariwa nuclear power plant to cause an accident, and thus allocated no attention to tsunami. In addition, Yoshida misunderstood that isolation condenser would be in operation and thus he did not order the site workers to prepare for pouring water into the reactors alternatively, e.g. using fire-fighting vehicles. As a result, the reactors, left overheated, became worsened. As Taniguchi (2012) argues, Yoshida was not a hero, but a remote cause of the crisis. Thus it is more likely that an investigation into the cause of the disaster without history would distort the truth.

Secondly, Naoto Kan, the Prime Minister, lacked leadership to orchestrate adequate actions in the emergent crisis. Independent Investigation Commission on the Fukushima Daiichi Nuclear Accident (2012) argues that he was obsessed with top down management, had a big attitude, and relied too much on personal advisors due to distrust of TEPCO and bureaucratic organizations. He failed to take an overall view of what was going on and thus was preoccupied with stopgap measure in the crisis.

Nuttall (2011) presents two different views on the Fukushima nuclear crisis. First,

¹⁰ *The Daily Telegraph* (July 23 2012).

¹¹ More on this, see Taniguchi (2012, Ch. 3).

Three Mile Islands and Chernobyl were unforced errors of the nuclear industry, whereas Fukushima was a side consequence of a natural disaster such as the 9.0-magnitude earthquake and 14-meter tsunami. Thus Fukushima is much less troubling than those earlier accidents. Second, the crisis reveals the worst kind of design basis error. But in our view, an industry which makes such basic errors in its assumptions simply cannot be trusted. He would say that we should not overreact to the crisis that has no deaths unlike other severe accidents, but we do not subscribe to such view, partly because the view overlooks the potential impact of radioactive materials on humans and environment and partly because it is likely that the view could be a red herring for moving nuclear development forward without cautious investigation into the causes of the crisis with focus on history and trans-disciplinary transmission of capabilities. In the following, we will discuss that governance as a dynamic capability facilitates such transmission to remedy the combined failure of institutions.

Governance as a Dynamic Capability to Remedy Multiple Institutional Failures

Here, we would like to examine what kind of multiple institutional failures to be observed in the cases discussed above. Let us start with the case of Minamata. First, it is likely that the market did not function well since Minamata relied too much on Chisso in terms of regional development and thus it became no more than a business castletown. A single company had enormous control over economy, society, and politics and thus they were embedded somehow in the company (Granovetter 1985; Aoki 2001). In fact, the population of Minamata was 12,040 when established in 1889 by way of organization of municipality, but the population soared after the plant was built in 1907. The population grew, along with the development of the factory, to 17,192 in 1912 and 42,137 in 1949. There were 50,461 people in 1956 when the first patient of Minamata disease was found. In 1960, the population of people aged 15 or over was 19,819, 4,757 of which were people involved in Chisso and its suppliers. In addition, tax payment by the company and its employees, including fixed assets tax and residential tax, made up more than 50% of the city tax revenues in the late 1950s. People increasingly believed that Minamata could only exist with Chisso and thus the growth of the company would lead to regional development. Such belief was reflected in that people involved in Chisso became town mayor and town councilor. Surprisingly, Hikoshichi Hashimoto, who developed manufacturing technology of acetaldehyde at the plant and was served as the factory manager, became the city mayor of Minamata.¹² Thus Minamata was dominated by Chisso and consequently the regional monopoly prevented the local market from functioning well.

Secondly, Chisso ran away with the process of manufacturing dioctyl phthalate from octyl alcohol, which was significantly advanced that the competition could not follow the technology at that time. The company also monopolized the process of manufacturing octyl alcohol from acetaldehyde. As octyl alcohol is the basic ingredient of vinyl chloride, the very fact that the demand for vinyl chloride surged necessitated the company to produce more octyl alcohol and thus more acetaldehyde (Ui 2004). MITI supported manufacturing ramp of acetaldehyde. As Japan was in the midst of the process of economic growth, most of the

¹²See <http://www.nimd.go.jp/syakai/webversion/houkokushov3-1.html#chap110>.

people in the country thought that corporate growth and increasing production could be worth more than anything else and thus the issue of plant effluent with poisonous organic mercury was regarded trivial and insignificant. To be worse, Chisso controlled completely the municipal administration by sending their people to the city assembly. It seems unlikely that the mayor from Chisso would implement regulatory measure to hamper production and expansion of the company. As noted above, the company skirted their responsibilities until the causative substance of the factory was proved rigorously although it was widely recognized that Minamata disease was caused by methyl mercury compounds in the wastewater.

Thirdly, it seems likely that the government put too much emphasis on economic growth so that they were unwilling to slow the Japanese economy by hogtying companies with regulations. Astonishingly, the wastewater of Chisso adapted to the Japan's discharge standard and thus could be used as drinking water (Banaki 2012). The government should have prohibited fishing in Minamata Bay and demanded Chisso to stop discharging wastewater into sea without awaiting clarification of how the disease occurred and what was the causative substance of the disease.

In particular, MITI formulated Policy for Developing Petrochemical Industry in 1955. Chisso played a pivotal role in manufacturing acetaldehyde during the period of transition from electrochemistry to petrochemistry. The company was a national policy concern before the war and was still protected by the government as a driver of the industrial development after the war as well. Hence, the case of Minamata involves multiple institutional failures.

As for the case of Fukushima, we can observe multiple institutional failures as well. First, the electricity market has been monopolized by TEPCO due to regional monopoly permitted by the government. It should be of no surprise that market competition does not function at all. The company had to rely on other companies' capabilities necessary for introducing and maintaining reactors at the nuclear power plants. The monopolistic position gives the company the power to attempt planned blackout and impose higher price for electricity on consumers if it needs to collect money for compensating for nuclear damage. And integration of power generation, transmission, and distribution could be an entry barrier for the potential competition. Regional monopoly deprives the society as a whole of freedom to choose and diverse power sources.

Secondly, TEPCO is obsessed with the business model based on nuclear power generation because it is so lucrative that the company should dig itself deeper into the hole. The company attempted to assimilate a variety of organizations into the nuclear village by using monopolistic, not Schumpeterian, rents as attractor. Thus the nuclear village grows to the extent that it covers significant part of the Japanese economy. It seems likely that TEPCO traps itself in a program persistence bias and thus cannot escape from the trap even after the Fukushima nuclear disaster. The more program adherers become, the more difficult it becomes to deviate from the nuclear development equilibrium.¹³

Thirdly, membership of the nuclear village covers the government as well. This implies that the electricity company could control the government to formulate laws and regulations that facilitate nuclear development. In particular, both the Three Power Source Development Laws and the Act on Compensation for Nuclear Damage are evil laws. The former made

¹³This is illustrated by the story of the hasty restart of Oi nuclear power plant in Fukui, which is run by Kansai Power Electric Power Company in July 2012.

local governments fail to initiate innovative activities for nurturing new industry and developing regional economy. They got huge amount of money by allowing electricity companies to build a nuclear power plant, and wasted the subsidy to build new buildings by local companies, some of which are run by the relatives of local mayor and municipal councilor. They got addicted to “nuclear money” over time like junky, because it would be a much easier way to get money for regional development. But unfortunately, that could not be a way to develop the local economy. On the other hand, the latter led TEPCO to act opportunistically in that the company put more emphasis on the social safety created by safety dogma rather than the substantial, physical safety of the plant, because compensation beyond the upper limit will be done by the government and thus tax payment by the public. Such moral hazard action is certainly a remote cause of the catastrophe.¹⁴

Catastrophes like Minamata and Fukushima are caused by lack of capabilities of economic agents, which could be reflected to institutional failure. The cases relates to multiple institutional failures rather than single institutional failure. The market, the firm, and the government sometimes fail at the same time. Governance as a dynamic capability should remedy multiple institutional failures, which could be the main cause of the catastrophes. This implies that governance is expected to mobilize capabilities scattered across the world and then reconfigure them to revive the community devastated by catastrophes as soon as possible and prevent the relevant issues from deepening into complete loss of the sustainability of the corporation, the nation, and Earth by taking precautionary measures against them. In other words, governance must function as a catalyst for institutional change.

Furthermore, we should pay heed to the governance of business ecosystem if we investigate into the cases of Minamata and Fukushima, which involve meta-organizations and the society. As for Minamata, Chisso would share the goal to establish the foundation of chemical industry for economic growth with MITI. The government did not take measures to bar the company from discharging contaminated wastewater which caused the disease. On the other hand, the company sent its people to the municipal government to control the regional economy. Local residents in the communities were embedded in the company as employees or the constituents of its suppliers. Thus part of the society was unwilling to go against corporate policy. As a result, Minamata became a business castletown, where the sustainability of the company was identified with that of regional economy. The same story applies to the case of Fukushima, but Fukushima would be more complicated. TEPCO and the government formed a colluded complex, i.e. the nuclear village, which facilitates nuclear development. The government had an incentive to sustain nuclear development for securing job opportunities for the retired bureaucrats. And it established the regulatory institution, Nuclear and Industrial Safety Agency, inside the METI (Ministry of Economy, Trade and Industry) which is the MITI's successor for nuclear development to support corporate growth and economic development. This implies that regulations would be distorted in the advantageous way to nuclear development. Some may argue that the case of Fukushima is completely different from Minamata in that for the first the failure was primarily due to unforeseen natural events. However, this argument does not hold given the predisposition of Japan to natural disasters. Safety measures against earthquake and tsunami, which would impose tremendous costs on electricity companies including TEPCO, were not taken appropriately. On the other hand, TEPCO has massive power over politics and economy enough to

¹⁴See Taniguchi (2012).

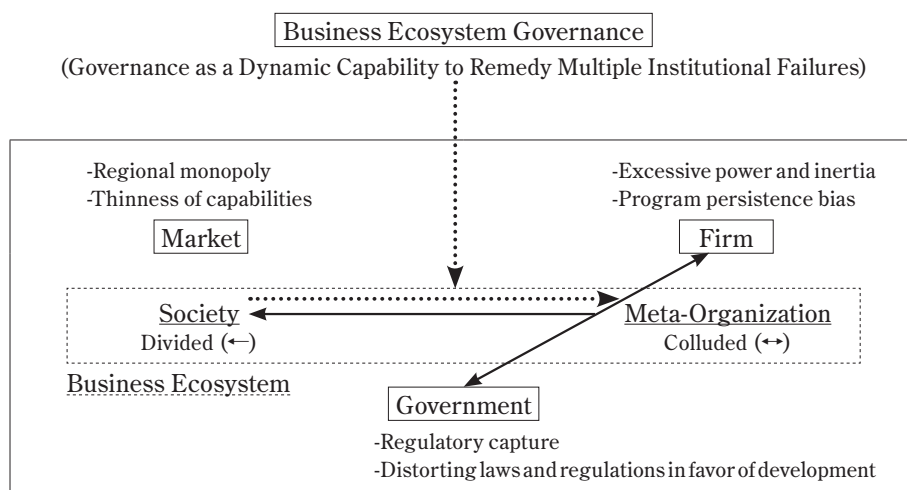


Figure 2. Business Ecosystem Governance

control the rules and regulations in the relevant field. It became arrogant enough to neglect learning from others as well as adapting itself to environmental change. The company sent its people to the diet and the municipal government to control the regional economy. Local residents in the communities were embedded in the company as employees or the constituents of its suppliers. Fukushima became a business castletown, where the sustainability of the company was identified with that of regional economy.

Although it seems unlikely that local residents go against nuclear development if they are strongly tied with nuclear business of TEPCO, part of the society that experienced nuclear accident in general tends to become a convert to anti-nuclear development. After 3.11, this is reflected into the anti-nuclear demonstration held every Friday evening in front of the prime minister's official residence. Thus the society is being divided into the supporter and the opponent in terms of nuclear development. In any case, it would be difficult to say that the society is given a fair hearing equally.

Regarding the two cases, the problem is that it would be hard for the embedded community, or more widely the divided society, to change the way of doing things of the relatively tight-coupled meta-organization, consisting of the company and its controlled government, even if it was proved to be inappropriate in that it would lead to environmental damage and to be worse, the sustainability of the nation and Earth. Even if catastrophes inflict a heavy sacrifice on the embedded economy, it often sticks to the sustenance of system-level goal such as corporate growth and economic development. In other words, local residents choose to stay the community, in which catastrophes such as pollution and nuclear disaster occur, even if they become fatal victims. They are unwilling to attempt to change the action of meta-organization by accepting their fate with resignation. Thus business ecosystem governance does not work at all.

As business ecosystem governance involves how to remedy inappropriate actions of the government, we have to design institutions to facilitate the formulation of consensus, capabilities transmission, problem-solving, and disciplinary actions across the national border among a set of individuals, organizations, and meta-organizations to improve global sustainability by changing how the government acts in the era of globalization. In this sense, such

governance could be a dynamic capability that is required for creating change. As shown in Figure 2, it is a higher-order mechanism which affects the action and cognition of the meta-organization and the society to adapt corporate sustainability to global sustainability. This enhances the capabilities of the society necessary for disciplining and monitoring the action of the meta-organization that leads exclusively to corporate sustainability. In other words, it is the mechanism by which to some extent profit maximization and economic development could be sacrificed for global sustainability.

Conclusions

Pollution and nuclear disasters can be taken as compensation for that we have put too much on economic development, neglecting the essential factors such as safety and assurance that cannot be necessarily compatible with corporate sustainability. Institutions for economic development tend to persist due to their inertia and path dependence although they have completed their roles at a new stage in which global sustainability rather than corporate sustainability is an urgent issue to deal with. In this respect, the environment in which those who are obsessed with economic development as well as the orientation towards economic development is no doubt desirable prevail requires governance of economic development. This must be a global issue which goes beyond the national border.

As Karl Marx once said in "Theses on Feuerbach" in 1845, "the philosophers have only interpreted the world in various ways; the point, however, is to change it" (The 11th Thesis). Changing the interpretation of the world is difficult, and furthermore, changing the world is much more difficult. We have to tackle three different types of institutional failure at the same time.

As the regional economies in Minamata and Fukushima were monopolized by Chisso and TEPCO, local residents were embedded in the companies and thus they had to believe that corporate growth was good for them even if this was achieved by producing poisonous methyl mercury compounds and radioactive substances as byproduct and led to the spread of ill health. If market competition had worked effectively, it would have been much harder for the company to throw the residents under the bus due to unquenchable thirst for profits. But the market did not function for this purpose.

Chisso and TEPCO attempted to cling to the conventional profitable business model even if the model could lead to the catastrophe, which devastated local communities and deprived vulnerable groups of freedom and even life. Manufacturing acetaldehyde with mercury as a catalyst or generating electricity by way of obsolete nuclear plants without safety measures might be lucrative and thus good for corporate sustainability in the short run, but not sustainable at all for Earth. Further, Chisso and TEPCO did pretend to be good and honest, but the former set up the Cyclator to pretend to be able to purify the contaminated effluent, whereas the latter set the society up by prevailing safety dogma, saying that nuclear power is completely safe. These were nothing more than dishonesty.

The government did not order Chisso to stop discharging contaminated effluent into sea, just awaiting clarification of the generating mechanism and causative substance of the disease. Such delayed decisions unintendedly increased the number of patients and deaths. On the other hand, the government decided to restart a nuclear power plant after the Fukushima even if the plant does not have yet safety measures against earthquake and tsunami. The government must be a capture of development rather than a gatekeeper of the

nation's safety and security. To make the government play such essential role requires a new mechanism which is well beyond the traditional concept of governance.

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