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Globalization of Uncertainties: Lessons from Fukushima

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1. Introduction

The tragedy of Fukushima began as an earthquake followed by a tsunami of unexpected dimensions [2], but the worst came as a cascade of human mistakes done by agents of the Japanese government as well as by high rank officers of *Tepco* (Tokyo Electric Power Company). We are not speaking of just a natural accident, or of an unbelievable number of political mistakes, it is more than a triple disaster of earthquake, tsunami and reactor meltdown. Actually we are in front of a structural tragedy.

A year after these happenings it is evident that their consequences have been much greater than it was supposed in the first moments and that the affected people, not just Japanese citizens, are more numerous than it was expected. For example see [3]. The most damaged prefectures are Iwate, Miyagi, and Fukushima, which have a combined area about the size of Denmark or Netherlands, but the whole country has been affected by the consequences of Fukushima's accident.

My point is that all this happened because the main concerns by the location, construction and operation of the nuclear plants in Fukushima were mere economical ones. Maximization of profit for *Tepco* and not the wellbeing and safety of the Japanese population was the driving force and the main criterion. In front of these facts it becomes evident the necessary self protection of society and this issue is discussed in the first part of this article, basing on Karl Polanyi's *opus magnum*. Following the ideas of this author in the next section is briefly explained the concept of fictitious commodities, which Polanyi applies to labor, land and money, but I suggest to include nuclear power as a particular type of the fictitious commodity land, which has played a central role for Japan's economic development.

The promoters and defenders of the use of nuclear energy have constructed what I suggest to call a "Gaussian" justification. It should be remembered that the normal or Gaussian distribution of events is considered the most prominent probability distribution in statistics.

The “bell” shape of the normal distribution suggests that the events located in the tails or extremes of the bell, can be considered highly improbable. This idea is developed in the paragraph. But the other side of the coin is unexpected events of tremendous impact, what Taleb [4] calls “Black Swans”. After explaining this concept, it follows a review of the reactions to Fukushima, understanding the accident as a kind of “Black Swan”. This examination leads us to the crucial question: which society must be protected from the use of nuclear energy? In this part I try to answer this question taking into account the current globalization, a process that is putting into strong and speedy circulation not just commodities, money flows and information, but also fears and uncertainties.

All this cannot be understood without considering the cozy relations between economical and political elite in Japan, expressed clearly in the *Amakudari*-System, which is discussed in the next part of the article, which concludes with some thoughts about further lessons and consequences of Fukushima.

2. Necessary self protection of society

In *The Great Transformation* Karl Polanyi explains that the continuous expansion of the market mechanism sooner or later hurts the society and its reaction is the search for self protection. The author shows several examples from the history of Western, particularly English, capitalism since the times of the Industrial Revolution until the crisis years during the 30's. However it is easy to find more and more cases of such responses of societies when the market dictatorship pervades different realms of human life, especially in the present age of Neoliberal Globalization.

From the Polanyian point of view there are two opposite forces or tendencies along the history of capitalism. One of them is the unlimited expansion of the self regulated market and the second one is the self protection of society that appears as reaction to the former. Each of them takes different historical shapes and their confrontation is always different depending on the concrete historical moment. Also the social forces promoting each tendency vary in a great scope. These protecting forces can be local or national governments, churches, labor unions, and currently NGO's whose activities are located in several realms.

These both tendencies are fighting all the time and their fight shapes the whole dynamic of our world. It seems that during certain historical period one tendency dominates and then it is defeated, at least for a while, for the opposite force. It is important to note that this is in no way a mechanical movement, but it is the outcome of social struggles. The relevant point is that the first tendency is due to the nature of the capital accumulation and it is adequate to the unlimited search for profits that corresponds to the competition among individual enterprises, and that the second tendency must appear because the pursuit of the market logic is the transformation into commodities of three things that cannot be real commodities, because they are not produced for their sale in the market. According to Karl Polanyi, these three fictitious commodities are labor, land and money. Their commodification is essential for the continuous functioning of the capitalistic production system, but at the same time, the triumph of the unlimited expansion of self regulating market would mean the destruction of the social fabric. This is the reason for the necessary self-protection of society, whose interests can diverge from the pure economic interests of the group that is ruling the economy.

3. Fictitious commodities: labor, land and money

Labor, land and money are not real commodities because they are not things produced for be sold in a market. Labor is, according to Polanyi, just a different name for the human beings. Labor is a vital activity of men and women and cannot be separated from actions corresponding to other human realms. Land is a name for Nature and for the entire environment that allows our existence on this planet. At the same time, the land has several meanings for the societies. It is soil, space for living and recreation, source of food, symbol of traditions, home of the ancestors and many others. Money is a political institution and it is strongly linked to the existence of nation states. In spite of all these facts, the pace of capitalistic accumulation and even the reproduction of a whole system based on great scale industrialization require the treatment of labor, land and money as commodities. This means that they must be disposable all the time and offered at prices determined by supply and demand. By this way it is granted the uninterrupted process of industrial production and its supplementary operations, like trade and commerce, as well as other services.

The problem is that according to the market logic, if there is oversupply of some commodity, its price must descend or even be close to zero. On the other hand, if there is excessive demand, the prices can be extremely high, making such commodities totally inaccessible. Consequences of the application of this kind of mechanism are, for instance, unemployment, homeless people, and extreme spoliation of natural resources.

Under such circumstances it is necessary to take political and economical measures and these are taken usually by the governments on behalf of their societies. Depending on historical circumstances one of the three fictitious commodities can become relatively more relevant at a certain moment. But the truth is that the three are deeply related. This fact is obvious today when unemployment and monetary crisis are present everywhere. But, what is happening with land? Of course the current situation is quite different from that one studied by Karl Polanyi, but simultaneously new forms of the problem have arisen. Speaking of Japan, for instance, the rocketing prices of urban soils have played a central role during the "Bubble-Economy" and they are still a major problem for the development of many Japanese cities. Parallely, in many countries the commercial use of land is contributing to pollution of the environment and it is even endangering the conditions of life. However, the experience of Fukushima is showing us that we are facing a new problem that was unknown to Karl Polanyi, namely, the use of nuclear power as a simple commodity. To demonstrate that this is by no means a usual commodity is also a new task for social scientists, as well as a good opportunity to further develop the theoretical approach of the author of *The Great Transformation*.

4. Nuclear power as a particular case of the fictitious commodity land

Some months after the publication of Polanyi's *The Great Transformation* were dropped the atomic bombs over Hiroshima and Nagasaki that allegedly accelerated the end of the second World War. This event marked the beginning of the massive use of atomic energy in the "first", as well as in the "second" and the "third" Worlds. The main outcomes have been the creation of an "atomic industry" and, coincidentally, the industrial use of atomic power. This

use has depended on economical and political circumstances and it has been strongly related to the military power of certain nations. It has depended too on profitability and the social acceptance of oil exploitation. As long as oil is cheap, there is no urgency of introducing the use of nuclear power. On the other hand, there is the idea that nuclear power is “clean” energy, compared to energy produced by oil and coal. However, the main raw materials used in the atomic industry, like uranium and plutonium, are like fossil fuels, non-renewable materials. In essence they are parts of the land, specifically of the subsoil. Therefore, from a Polanyian perspective they can also be considered as fictitious commodities. My point is that they are fictitious commodities as well for other reasons that Polanyi, for obvious historical circumstances, could not recognize.

First of all, nuclear materials are too dangerous and their use, even their non-military use, has consequences not just for the citizens of the nation which is applying them, but also for her neighbors and under certain circumstances the neighborhood could be the whole planet. Therefore the construction of nuclear plants cannot be regulated by the relative prices of the atomic materials. Besides this kind of materials cannot be sold to anyone with enough money to buy them. Their use implies political and even moral responsibilities. Moreover this use should not be in the hands of individuals but decided by the affected societies and social groups, and obviously regulated by governments.

Unfortunately the nuclear energy has been treated as any other sources of energy. Its use has been decided on profitability basis and according to economic criteria. This has been the case particularly of those countries, like Japan, that do not dispose of abundant fossil fuels. At this point it should be remembered that according to Karl Polanyi, the commodification of labor, land and money threatens the social fabric. What happens with nuclear energy? The experience shows us that its use (or the consequences of its misuse) is certainly threatening the social relations. The situation of the 148,000 Japanese evacuees that remain at temporary shelters is a good example. But probably the main issue is the endangering of life through air, soil and water pollution. These facts allow us to speak of nuclear energy as a fictitious commodity. Because their raw materials come from the subsoil, it could also be considered as a particular sort of the fictitious commodity land. This “commodity” has played a central role in the modernization process of several countries and it was a clue factor during the whole period of the “Cold War”. In Japan it has been the axis of the so called nuclear village and a strong pillar of its modern economy.

5. Justifications for the use of nuclear energy in Japan

In 1954 the Japanese government began a long term nuclear energy program. Firstly were foreign companies engaged in this program, but soon Japanese companies became leading actors in this new industry. Since then in Japan were constructed 22 nuclear plants with 54 reactors all over the country, which supply about one third of the consumed energy in the country.

The economic development Japan’s during the second half of the XX Century had a lot of factors, including cultural and even religious ones [5]. But it is impossible to explain such a rapid economic expansion without taking into account the permanent supply of cheap

energy, a key input for the industrial production and particularly for the leading Japanese industries which are responsible of the “Japanese miracle”.

It is also true that Japan was forced to make use of nuclear energy, particularly after the oil crisis in the early 70's. A safe and continuous provision of energy became national priority, but after so many years it is evident that nuclear power is not a cheap source of energy. However, the cost of electricity generated by nuclear energy does not reflect the real cost. Japanese nuclear industry still does not have any final nuclear waste disposal site. Besides there is a “statistical” justification for the use of nuclear energy: the probability of a nuclear accident is very low.

According to the International Atomic Energy Agency (IAEA) since 1952 up to 2011 in the world has happened 33 nuclear power station accidents and incidents. Following the International Nuclear Events Scale, from 1 to 7, 12 of them have been accidents with local consequences (level 4), 13 of them were incidents or serious incidents, 5 have been accidents with wider consequences and just 3 were serious or major accidents. These data shows that just 9% of the incidents could be considered as serious or major accidents. Three accidents of this kind in a period of half a century can be seen as really few. In other words, the probability of major nuclear disasters is acceptable low. Therefore, so say its defenders, the use of nuclear energy could be seen as relatively safe.

On the other hand, particularly in Japan, the main sources of nuclear accidents are earthquakes and tsunamis. Therefore nuclear plants in this country are constructed with building technology that allows the facilities to resist such kind of natural phenomena. For the construction are taken into account the probabilities of earthquakes and tsunamis of different intensity levels. Concerning Fukushima it was calculated that in case of tsunami the waves could not be higher than 7 meters. Actually, more than 1,100 years ago was the last time that a tsunami of such scale as the last one lashed the shores of Tohoku [6]. This means, that the probability of higher sea waves was extremely low. Surprisingly, at March 11th, 2011, the waves reached 14 meters high.

The reasoning of the promoters of the use of nuclear energy is very common and it is even the dominant way of thinking in several fields of science and politics. It is namely the “Gaussian” view of the world, which orders the daily events according to the likelihood of their happening. The outcome is a statistical distribution of events called *normal distribution* and its graphical representation is the well known *Gaussian Bell*. According to this view of the world, what matters is that occurs in the center of the distribution, namely under the greatest area of the bell.

The question is if our real world is a Gaussian world or not, and therefore if the events located in the extremes of the normal distribution are truly negligible. This question becomes tremendously relevant if the supposed improbable events are matters of death or live and if they affect wide areas of our planet

6. A Black Swan named Fukushima

In his fascinating book Taleb discusses the relevance of highly improbable events. These sorts of events are called Black Swans because before 1697, when the first Europeans

discovered black swans in Western Australia, it was a common idea in the old continent that all the swans were white. Therefore a black swan was impossible or more strictly expressed the probability of seeing a black swan was minimal. Taleb demonstrates that in the field of financial and in general economic history, highly unexpected events have played a tremendous role. The examples are very numerous and cover a long time scope from the Crisis of 1929 to the fall of the Berlin Wall in 1989 and even later.

Following the concept of Black Swan developed by Taleb, I suggest that nuclear accidents can be described as Black Swans and more precisely, that governments and entrepreneurs, political parties and other organizations who have promoted the use of nuclear energy are convinced that this use is safe because the probability of serious nuclear accidents is so low that these sorts of events are Black Swans. My point is that even if this idea could be correct, nuclear accidents do not need to be frequent to be important. They are the kind of highly improbable events that deeply impact our lives.

At this point it should be remembered the words of Hugh Gusterson [7] at the *Bulletin of the Atomic Scientists*: “We have now had four grave nuclear reactor accidents: Windscale in Britain in 1957 (...), Three Mile Island in the United States in 1979, Chernobyl in the Soviet Union in 1986, and now Fukushima. Each accident was unique, and each was supposed to be impossible”. In 2001, *Tepco* estimated that the maximum tsunami at the Fukushima plant would be 5,7 meters. In fact the waves were two times higher and against the predictions of supporters of nuclear energy Fukushima was possible. However, it has been said that what happened in Fukushima was not just a natural accident, but a man-made accident [8,9,10]. The point is if such accidents can be avoided, in other words, if the nuclear energy can be used in the future in a safety way. There are basically two answers to this question. The first one is that Japan still needs the nuclear energy for the normal functioning of the economy and also that it is possible a safe use of nuclear energy. There are currently plans to set up 12 reactors nationwide. These plans contradict public opinion, which generally united in reducing nuclear plants; instead of increasing them [11]. Besides, in one of his first messages as Prime Minister, Yoshihiko Noda stated that atomic power is needed to save the economy [12]. It is also accepted that in the future, in year 2030 according to Noda [13], it is desirable to abandon the nuclear energy and it should be replaced by “green” energy sources, but now it is unavoidable, so they say, to depend on nuclear energy. At the time of the OPEC’s oil embargo in 1973, Japan’s nuclear power industry was already in existence, but then the Japanese government made major nuclear construction a priority. The goal was to reduce dependence from oil. In the 1970s the share of the country’s energy coming from oil was 80 percent and about 30 years later it was just 45 percent. But the truth is that Japan has merely shifted its dependence from oil to other fossil fuels, like coal, natural gas and nuclear power. Moreover, these fossil fuels must be imported into the country. In addition there is the opinion that nuclear power’s contribution to Japan’s energy security may have already reached the top. For example see [14]. The defenders of nuclear power say that this energy is cheap. Although, the electricity costs in Japan are some of the highest in the world. Also it is said that the nuclear power output cannot be matched by renewable sources. On the contrary, a study of Japan’s Ministry of the Environment published in April 21, 2011 [15] shows an extremely large potential for wind power generation.

But there are also other considerations for a further support of the Japanese nuclear industry. They are related with the strategic geo-political location of Japan within Asia, where the nuclear capacities of North Korea and China are not negligible. Moreover, it is also important to keep in mind the Japan-US Security Treaty which largely promoted the introduction of nuclear energy policy in Japan in 1950's. Thereafter, commercial nuclear plants operate from 1960's. Accordingly, Japan started to construct nuclear power plants because of strong US requirement and with supply of concentrated uranium and nuclear reactors despite citizen's contrary opinions. These opinions are the second reaction, namely, a radical and absolute rejection of nuclear energy. The argument is that this kind of power is always unsafe and it is a permanent threat to the whole humankind. Besides, there are now the possible alternative sources of energy, like wind, water, sun, biomass, for instance. Moreover, public opinion against the nuclear energy is not new in Japan. The first protests took place in the 1960's during the student demonstrations against the Japan-United States security treaty. But never in the past reached this movement the strength it has now. A good example of the present critics is Nobel laureate Kenzaburo Oe, who is against prioritizing the economy over safety, like new Prime Minister Yoshihiko Noda is doing when he declares that idled nuclear plants should resume operation when safety is confirmed. On the contrary, Oe [16] said: "We must make a big decision to abolish all nuclear plants". According to the famous writer, the nuclear accident at the Fukushima No. 1 plant was like a third atomic bombing that the country inflicted on itself.

In his campaign Oe is not alone. Some examples are noting worth [17]. In Yamaguchi Prefecture there is a citizens group opposing the planned construction of a nuclear plant in Kaminoseki, a nuclear project initiated by Chugoku Electric Power Co., and since March 2011 in several cities of Japan anti-nuclear protesters have taken the streets. Such demonstrations happened in Tokyo and other important cities in March, April, June and September last year. Moreover, 68 percent of respondents to an *Asahi* newspaper poll published on August 8 said they wanted new Prime Minister to continue the phase-out of atomic energy. Particularly, public opinion polls taken in April 2011 showed around 50% supported the use of nuclear power at present of increased levels. But one month later, the May polls [18] showed a reduction in support to around 40% and a growth in opinion to ever 40% of those wanting to decrease it and 15% wanted it abolished. At the time I am writing these lines, one year after Fukushima's disaster, according to the opinion poll conducted recently by the *Asahi* newspaper [19], 57 percent of people opposed the restart of nuclear reactors with 80 percent not trusting the government's safety measures.

I suggest understanding these two different kinds of reactions as follows. The supporters of the first point of view are considering mainly the requirements of the economy and more precisely of the industrial capitalist market economy which is the axis of the present globalization. The defenders of the second opinion are taking into account firstly the society and her needs of security and welfare. Moreover, they are also acting on behalf of future generations. The first group is looking at the present; the second one is looking at the future. The first one worries about profitability and money earnings. The second one worries about quality of life and even about the conditions of life in the planet. In sum, the first one wants

to protect the market. The second one aims at the protection of society. This leads us to the following fundamental question:

7. Which society must be protected from the use of nuclear energy?

When Karl Polanyi speaks of the self-protection of society against the unlimited expansion of the self-regulated market he is talking about national societies. His scenario is the national state and its society. Six decades after the publication of *The Great Transformation* the neoliberal globalization has eroded the power of the nation-states as well as deepened the interactions among different national societies. Certainly it is too early to speak of a one global society, but there is no doubt that the level of interconnectedness between continents, nations, regions and peoples nowadays is higher than ever before. This fact has been strongly highlighted by the events in Fukushima that very soon became not just events of Japan but world happenings. Or in other words, facts that affect the lives of people who are living not just in the neighborhood of Fukushima or in Japan, but also in nations located close to Japan, like China and Korea, and even in countries of other continents. For instance France, where arrived some shipments of Japanese green tea contaminated with cesium. Not to mention the negative impacts in several countries where Japanese companies are located due to interruptions in the supply chains, because a lot of medium and small enterprises of the damaged areas of Japan play a key role for the smoothly functioning of whole commodity chains around the world. Moreover is also worth noting the case of Japan's trade partners whose populations are afraid of consuming contaminated food produced in Japan.

Under these circumstances it is obvious that Fukushima was not a mere national accident and that it affected not only the Japanese society, but social groups of many countries. The Japanese society has shown that self protection is not an impossible task. The achievements of anti-nuclear protesters' movement continuing over the last 6 decades are not negligible. While there are 22 nuclear plants in Japan, there are also around same number of nuclear plant projects which were rejected because of citizen's movement especially after 1970's. The success of similar movements in other countries depends on local and national conditions, but also on their capacity of international coordination. Such coordination is unavoidable insofar as it is not just the Japanese society which must be protected from nuclear accidents happened in Japan or in any single country, but also other societies need protection. The important point is that they need protection from events happened beyond their frontiers. Put it another way, in this case Japanese companies, like *Tepco*, and the Japanese government are responsible toward the Japanese society but also toward many other societies of other countries; in sum, to the whole humankind. May be in the future we could speak of the global society. Some authors do this, but in my opinion there is no yet such society. Anyway, the point is that concerning nuclear power, the deeds and omissions of private enterprises as well as national governments can affect other societies. The question that arises here is: who should protect the safety of these societies? Their national governments? Supranational or international organizations? ONG's? Or it is necessary the building of new instances with enough international support, respect, power and resources that enable them to guarantee the safety of all human groups in the Earth?

Until now, it seems that the activities performed by the International Federation of Red Cross and the Red Crescent Societies are good examples of fruitful attempts to develop international cooperation and solidarity [20]. However, there is still enough space for many other organizations, for instance producer and consumer cooperatives, labor unions, local governments from different countries, just to mention some possibilities.

At this point is again useful to remember Polanyi. According to him, in the history of all societies the economical activities have been *embedded* in the society. Since the Industrial Revolution the unbounded expansion of self regulated markets has tried to construct a *disembedded* economy, regulated only by the market mechanism. Accordingly, the commodification of land, labor and money is just an expression of the disembedding process of the economy from society. Therefore a decommodification of the quasi-commodities (including nuclear power) would imply a process of re-embeddedment.

If this idea is correct, then what we need is a social embeddedment of nuclear power. In other words, the society or societies can be protected from the use and misuse of nuclear energy only if all the activities connected with it are strictly subordinated to social consensus and are performed under tight social control. It is possible of course that due to such control the nuclear industry should disappear and be replaced by other energy sources. But at the present moment and under current conditions the most important thing is that an effective protection of society supposes the overcoming of a present evil, namely, the fusion of the economic with the political power. This kind of perverse marriage does exist probably all over the world. In Japan it is called *Amakudari* and Fukushima has shown its dramatic consequences.

8. The big business of nuclear power and the benefits for the political-economical elite: The dark side of the *Amakudari*-System

Behind the nuclear industry there are powerful interests, which promoted Japan's economic rise in the 1970s and 1980s. Former Prime Minister Naoto Kan [21] talked about the power of the so-called nuclear village. More precisely, the nexus of the power companies, regulators and politicians supporting the industry is the biggest obstacle in moving away from atomic power.

It is well known that the nuclear industry everywhere is a high concentrated economic sector. Japan is not the exception. There are ten regional monopolies. These companies, so says Shigeaki Koga [22], "buy the academy by sponsoring research, buy the media through mountains of public-service advertisements and junkets, buy big business by paying top-dollar for everything, buy the bureaucrats and regulators by handing them cushy post-retirement jobs."

The relevance of the nuclear industry is due to huge investments in nuclear plants as well as to billionaire investment projects in the extraction of uranium. Here are at stake powerful interests of companies like Mitsubishi, Hitachi, Toshiba, Japan Steel Works, Muroan, Sumitomo, Itochu Corporation, and of course their foreign partners in USA, Europe and even Asia. For detailed information see [23].

Allegedly the nuclear companies must follow certain regulations and must be closely observed and supervised by the government. The fact is that in some cases, like *Tepco*, the government

control has been extremely loose and the company enjoyed a degree of freedom that has turned out to be harmful for the society and even dangerous for other countries. Moreover, *Tepco* has been the main actor of a black history of falsifications of data and other irregularities without the corresponding punishment. How could this happen? The answer is *Amakudari*.

The meaning of this Japanese word is literally “descend from the heaven” and it points to a very common practice in Japan, and also in other countries, which consists in the fact that retired civil servants of high ranks are hired by companies that were closely related with their ministries. Of course these old bureaucrats still have powerful connections with their former ministries, which allow them, now playing the role of private entrepreneurs, degrees of freedom that are very profitable for the companies, but not for the society.

In the 19th Century wrote Lord Acton: “All power tends to corrupt and absolute power corrupts absolutely”. There is no doubt that at least some of the former civil servants transformed in private businessmen have enjoyed very great power and influence. The use of them allowed *Tepco* to evade controls and regulations that in other circumstances would be unavoidable. The point is that *Amakudari* has produced a symbiosis between private entrepreneurs and government ministries. The consequence is that the later are more interested in protecting the former than serving the civil society. In cases of conflict between private and social interests is very likely that some civil servants become “capital servants”. Particularly in the case of *Tepco* it has been discovered that several former bureaucrats were hired by this company and this has been probably one important factor to explain the lack of control of the Japanese government over the nuclear company. Nevertheless, it must be admitted that the *Amakudari*-system made possible a close coordination between bureaucrats and industries and this coordination played an important role in the first phases of the Japanese industrialization.

9. Further lessons and consequences of Fukushima

Every day there are more and more news in the press about the consequences of Fukushima’s nuclear accident. The mismanagement of the crisis was the main reason for the resignation of former Prime Minister Naoto Kan and his successor, Yoshihiko Noda is facing amounting troubles, mainly because some politicians, like Yoshio Hachiro, a one-week minister of Economy, Trade and Industry, did not understand the deep meaning of the tragedy and did not perceive that many Japanese people are against the use of nuclear energy. A good example is even Mr Kan, who one year after the disaster openly declares that he is now a promoter of renewable energy [24].

The economic geography of Japan has been altered. The north-east of the country and particularly Tohoku has served as a source of energy power, manufacturing supplier, breadbasket, and labor force mainly for Tokyo, but the region has been also important for the Japanese companies located around the world. Also relevant is the fact that the Japanese regional economies are much more important for the whole Japanese economy and even for the world economy than it could be imagined. The point is that the economic potential of Japan’s regions is much larger than it is often assumed. For instance, the economy of Tohoku is similar to the economy of Argentina; Hokkaido corresponds to Ukraine, Kansai to

Netherlands, Shikoku to New Zealand, just to cite some examples. Moreover, these regional economies are not only strong, but they are strongly globalized. Particularly, the numerous parts suppliers in the disaster zone could disrupt global supply chains. Therefore it has turned out that dozens of small and medium firms are vital for the leading Japanese industries, like the car industry. In other words, the successful participation of the Japanese economy in the globalization is considerably based on the smooth functioning of these tiny and almost unknown firms located far away from the capital of the country. Recognizing this fact should justify the claims of the regions and municipalities for more autonomy in several realms such as the fiscal one and also concerning energy policy. This means to rethink energy policy and decentralize decision-making. In consequence, for instance, Hokkaido could benefit from its proximity to Russia's natural gas deposits of Siberia. Okinawa could make use of solar power. In the mountainous areas the eolic energy could be suitable. In sum, a uniform national energy policy seems to be out of place.

The work and everyday life of the Japanese people has been also altered. Several companies operating in the north-east of the country began letting more employees work outside their offices amid the electricity shortage caused by the crisis at the Fukushima No. 1 nuclear plant. This has shifted the work-life balance of many people, who is now working at home. Accordingly, if this kind of work continues for long time, the family relations will be positively transformed. Remember that the ordinary Japanese worker spends very little time with his family and sometimes he can see his children only on weekends. Besides, there is an increasing participation of women in the labor force. If these women began to work at home, it is sure that the family life will be qualitatively different. Important is also to remember that in Japan the commuting time is usually extremely long. During these hours people sleep, read or is attached to their *smartphones*. Now they will have the opportunity of sharing activities with their families. Besides, it seems that priorities have changed after March 11th. Now the most important thing is no higher salaries or to climb the corporate ladder, but people want to work near their families and they are more concerned about the safety of them.

In many countries of the world is usual to listen that the government bluntly lies, but in the case of Japan this negative opinion is quite new. Many Japanese people simply do not trust the government any more. To regain the confidence of the citizens, the Japanese government, particularly the national government, has a hard task to do. Something similar can be said about the industry leaders.

On the middle and long term the economy of Japan must drastically change for several reasons. One of them, the most obvious, is the fact that after the implosion of the bubble economy in the 1990s, Japan's economy suffered rapid decline and the signs of recovery are still weak. Moreover, the current debt crisis limits the economical activities of the government. The rapidly aging population (22.7 percent of the population) shrinks the productive workforce of the nation. But the decline of the nuclear industry and the strengthening of the alternative energy industry are also important. This industry is certainly not new in Japan but now there is a favorable opinion that could be of help for its development. For more information about this issue see [25]. Another relevant aspect of the post-Fukushima Japanese economy concerns the agriculture and fishing activities. For many

survivors land is the single most important asset of most households, and for the population at the sea coast fishing is the only way of life they know. According to some estimations the recovery of the Tohoku region will take over a decade, and the cost of recovery should be about 3 percent of Japanese GDP. This means a probable shortcut in the domestic supply of agricultural and sea products and consequently increasing imports of them. To satisfy the Japanese consumer, it would be necessary to modify the traditional protectionist trade policy of Japan. But this could also worsen the situation of domestic farmers and fishers. The *Archimedean* middle point will be surely no easy to determine.

Thinking about the kind of country the Japanese people want, one important consideration is the concentration of population, government, and industry in Tokyo. On February 27, 2012 *The New York Times* [26] revealed that: “In the darkest moments of last year’s nuclear accident, Japanese leaders did not know the actual extent of damage at the plant and secretly considered the possibility of evacuating Tokyo, even as they tried to play down the risks in public...” The evacuation of 13 million people is unimaginable. Where could be sheltered one tenth of the population of Japan? It was not necessary to do this, but the possibility was real and this leads us to ponder the pros and cons of megalopolis like Tokyo. This is of course not just a Japanese question. In the case of a nuclear disaster the United States, France, Germany, China and Mexico, for example, would be confronted with such a problem. But, at the same time, the disaster highlighted the weakness of sparsely populated towns, where providing social services for elderly residents is quite difficult. The best solution will be probably the construction of middle cities located in safe places.

A year after the tragedy of Fukushima numerous anti-nuclear power demonstrations have taken place in Germany, France, the United States and Japan [27]. This does not mean the victory of the anti-nuclear movement in the world. On the contrary, there are still strong defenders of the nuclear energy in the United States, in France, in China, just to mention some examples. However, the afore mentioned happenings show that it is taking shape a kind of global energy consciousness and that there are many people in the world recognizing that we all have “Fukushimas” at home.

Finally, there is one particularly controversial question. Namely, what kind of recovery will be desirable for society and which strategy could be the best one. Interesting suggestions about this topic can be read in [28]. Also relevant is to think out about the cost of recovery and who will pay for it: the consumers, the government, the industry? Should the government raise the taxes and/or sale its stocks of former national companies like Japan Post and Japan Tobacco Inc.? What is the responsibility of *Tepeco* and how can this company pay for its mistakes. Should it review its wage structure? Besides, there are also controversial points concerning about the way of reconstruction of Japanese economy, which is neo-liberal colored. Is it the right time to look for an alternative or non-neoliberal way?

Too many questions, but the answers must be found now. There is no time to waste. The future has already arrived, although it is probably not yet the desired future.

Concurrently, the disaster highlighted the unity, solidarity, patience, courtesy, and fortitude of the Japanese people. Particularly, the victims have shown an extraordinary capacity to

maintain social order among the chaos. Last, not least, the whole world has testified the great spirit and heroic acts of the Japanese people confronting the biggest nuclear tragedy since the bombing of Hiroshima and Nagasaki.

If a temporary conclusion could be formulated in few words, I would say that Fukushima has demonstrated that we human and non-human beings are passengers in the same spaceship. We all share the same everyday challenges, hopes and dreams, and our responses are essentially the same everywhere. We all are confronting the same fears and uncertainties. The defeat of one is the defeat of all, but undoubtedly, the victory of one person, of one people, like the Japanese people facing the tragic consequences of Fukushima, will be a victory for all humankind.

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