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Promotion of CO_2 assimilation by NOx, NP is easy method to protect global warming to get high GDP

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Abstract

Global warming is caused by lack of N and P by the elimination of NOx and NP in seven developed countries. Global warming can be protected, if enough amounts of nutrients containing nitrogen and phosphorous are supplied. Most easily available substances containing N and P are NOx and NP in waste water. If developed countries stop the elimination of NOx and NP, CO_2 assaulting is activated and global warming will stop. In addition, production of grain and fish will increase and GDP will increase. The goal "CO_2 zero and growth" described in Paris Agreement could be accomplished sooner than in 2050.

Keywords: NOx; CO_2 assimilation; Protection of global warming; NOx elimination

1. Introduction

Fossil fuel burn releasing 36 billion tone CO_2 and heart. Almost all CO_2 is used for CO_2 assimilation. Burning reaction is reverse reaction of CO_2 assimilation. If we can compensate the generation of CO_2 and heart of burning with the absorption of CO_2 and heart by CO_2 assimilation, global warming will be protected(1-50). Paris agreement asking us CO_2 emission must be equal with CO_2 fix by 2050.

The author found the way to protect global warming.

He found that global warming is caused by the lack of nutritious nitrogen and phosphorous. Lack of NP is caused by elimination of NOx and NP. The(ore if developed countries stop the elimination of NOx and NP. Global warming will not happen.

I was born in1930 at Tanokuchi, Kojima, Kurashiki in Japan. After getting Ph D majoring organic chemistry Author joined fertilizer company named Toyo Koatus (orient high pressure) making urea and studied on slow releasing fertilizer from urea. The author become professor at Department of Resource Chemistry, Ehime University. The author lectured about fossils fuel and cycle of CO_2.

He watched the change of the Seto inland sea for 80 years. He made clear the reason why global warming is progressing. For this purpose, he has investigated the increase of CO_2, fix of CO_2, how CO_2 is fixed and what kinds of fixed products are produced. I studied how much NOx is produced and how NOx is eliminated, comparing the countries which eliminate NOx, NP with those which use NOx and NP. The factors of GWPR (Global Warming Protection Ratio) and GDP were also discussed.

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The Seto inland sea was filled with fish before 1980. The sea was turbid by plankton. The bottom of the sea was filled with sea weeds and eelgrass. At around 1980 red tide happened at Kagawa p(ecture in Japan. Japan government set up a rule to eliminate NP and eliminate NOx completely. Then the Seto inland sea changed dramatically. Plankton does not grow. Fish disappeared. By the lack of nutritious nitrogen and phosphorous, agriculture and fishing industry suffered critical damage. Fish production of Japan decreased 90 %. DGP of Japan does not increase since 1980. The author investigated the anti-aging compounds. He found hyaluronic acid and glucosamine in fish are effective for anti- aging. He discovered that NOx, NP elimination retarded fish production, CO_2 assimilation, CO_2 fix and promoting global warming (51-58).

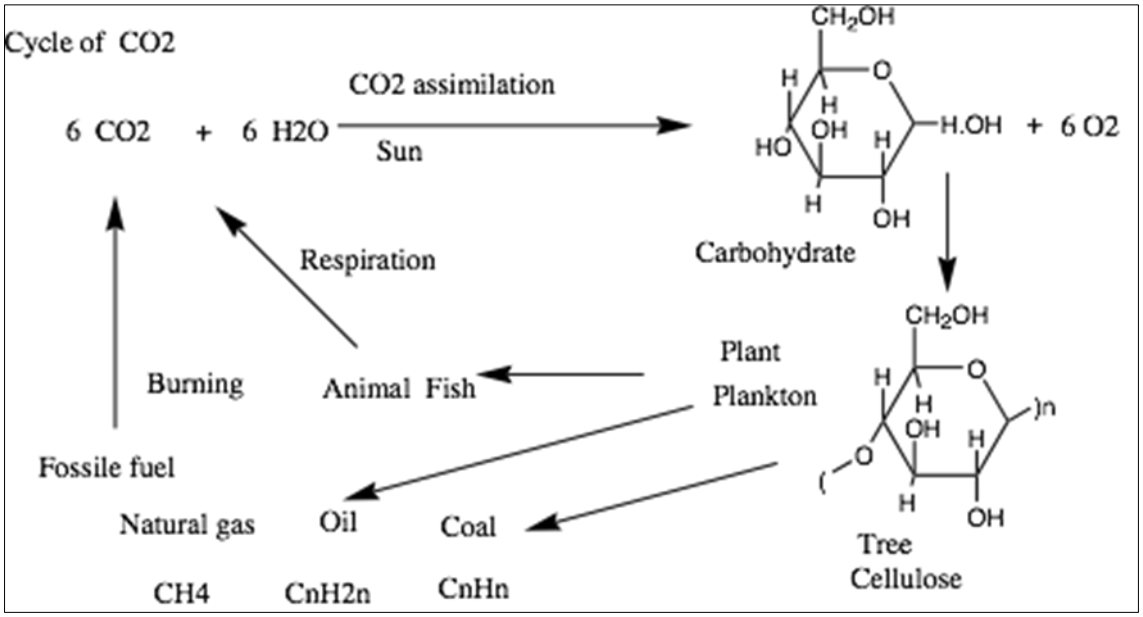

Figure 1 Cycle of CO2

He found that Global warming is caused by the lack of nitrogen and phosphorous. The lack of nitrogen and phosphorous comes from the elimination of NOx NP at 7 developed countries. The plant makes amino acid, chlorophyll and nucleic acid. It takes CO_2, nitrogen, and phosphorous with the same composition (C:N:P = 25:1:0.06) as plant itself. Plankton takes C, N, and P in the ratio of 6.6:1:0.06. Large amounts of N and P are necessary for maintaining plankton growth. 1/25 N of CO_2 and 1/416 P of CO_2 are necessary for plant growth. 1/6 N of CO_2 and 1/110 P of CO_2 are necessary for plankton growth. Nature sets up a system to provide nutrient N. When something is burned or sunder occurs, NOx is produced by the oxidation of N in compounds and by the reaction of N_2 and O_2. NOx is a gift from nature.

Many researchers including Dr. W. Nordhaus (Nobel Economic Science Prize winner) say global warming comes from the increase of CO_2.

For the first time in the world, He pointed out the following three important suggestions.

- Global warming is caused by lack of nitrogen and phosphorous by the elimination of NOx and NP.
- Global warming is caused by the retardation of CO_2 assimilation by elimination of NOx NP which do assimilation reaction with CO_2.
- Global warming can be protected if enough nitrogen and phosphorous are supplied. Most easily available substances are NOx and NP in waste water.

In addition, He proposed the following world-wide important idea to improve the global environment. If developed countries stop the elimination of NOx NP, CO_2 assimilation is activated, global warming will stop and grain and fish production increases and GDP will increase. Paris agreement, CO_2 zero and growth can be accomplished sooner than 2050.

I published 58 papers (1-58) about this subject. The important 12 papers (s 5, 7, 16, 19, 29, 32, 33, 37, 38, 39, 40, and 46) are selected and the key points of these papers are summarized in this document as follows.

2. Promotion of plankton CO_2 assimilation is most important (5)

Seventy % of CO_2 assimilation is said to be carried out at sea. Assimilation is carried out by sea weed and plankton. Sea weed and plankton are growing under ice at arctic and Antarctic ocean, eating much CO_2, absorbing much heat and giving much food for whales, penguin and earless seals. When we consider the fact that oil is fossil of plankton and coal is a fossil of tree. We astonish the magnitude, greatness and contribution of plankton assimilation.

The reason why earth is warmed up is due to the heat evolved by the burning of fossil fuels. CO_2 assimilation is a reverse reaction. By absorption of heat by CO_2 assimilation, earth can be cooled down.

$1.4x10^{10}$ t of fossil fuel was burned at the whole world in 2018 and about $4.4x10^{10}$ tons of CO_2 was produced and $2.5x10^{15}$ kcal of heat was produced. By doing reverse reaction, CO_2 assimilation, and by absorption of the same amount of CO_2 and heart, the equilibrium of CO_2 and heart will be possible.

3. NOx is best compound to reduce CO_2 (7)

The earth was born and plant appeared. Plant eats CO_2, H_2O, and Nutritious N, P. Plant is burned then NOx is produced to recover lost plant.

When no burning material is present like sea district, thunder storms make NOx. NOx is a gift from nature. We should not be against nature. We should use NOx as it is. In 2018, $1.4x10^{10}$ tons of fossil was burned and as the result $4.4x\ 10^{10}$ tons of CO_2 and $2.4x10^{9}$ tons of NOx were produced. If we use all NOx for the fixing of CO_2, we can fix $5x10^{10}$ (= $2x25x10^{9}$) tons of CO_2 as the C/N ratio of plant is around 5/1-50/1 (average 25/1).

However, NOx is hated as pollution gas causing illness. Many governments set up very strict laws to eliminate all NOx in burned gas and were forced to eliminate NOx using ammonia. On the other hand, Prof. Ozaki insisted that elimination of NOx should be stopped, because the toxicity of NOx is not so serious. Since NOx is essential for plant to grow and produce food. The maintenance of NOx at a certain level is very important. Namely, NOx is essential for the promotion of CO_2 assimilation and essential for the production of foods for the promotion of health and long life for the protection of global warming.

As far as the toxicity of NOx is concerned. no papers about serious sickness have been published and there have been no examples that NOx caused the death of peoples.

When NOx is released at uninhabited districts such as sea side far from houses, it does not give serious damage to persons. Since NOx is essential for the growth of plant and essential for the production of food and essential for all living biology, NOx elimination procedure and NOx elimination law should be eliminated.

Paris Agreement asks us to reduce CO_2. To reduce CO_2, we can make efforts to reduce the emission of CO_2 and increase CO_2 fixing. Prof. Ozaki for the first time proposed the utility of NOx for effective reduction of CO_2.

Thunder produces NOx, yellowtail, crab, and delicious rice. Thunder produces NOx from N_2 and O_2 in the air. About 4 million thunders occur in the earth in one day. As the result, ca. 30×10^{6} tons of NOx are produced by thunders in one year and about 20-80% of NOx are produced by thunders in the world. In the coastal area of Japan Sea, heavy snow falls. The amount of snowfall in this area is the highest in the world so that snow piles up to 2-3 m. At this district, thunder happens very often with snow. Among 47 p(ectures in Japan, the top five p(ectures where thunders happen often, *i.e.*, Ishikawa, Fukui, Niigata, Toyama, and Akita have 43.5, 35.0, 34.8, 32.2, and 21.4 days, respectively, as the days when snow falls. Thunder at winter time has several hundred times stronger energy than that at summer time and happens day and night very frequently producing much NOx. The gulf of Toyama (Toyamawan) and its surrounding sea area are rich in nutritious N derived from NOx which thunder produced and filled with plankton producing many Yellowtails (Buri) and Crabs (Kani). The(ore, thunder is called as Buriokoshi (yellowtail producer).

These 5 p(ectures produce very much delicious rice since thousands of years. There are proverbs, a year with many thunders produces good harvest, one thunder lightning gives one inch growth of rice. Thunder lightning is written as Inazuma (rice wife). Kaminari (thunder) in Japanese character is written Ame(rain) on the top of Ta(field). Most snow falling (3 meter) district Minami Uonuma is famous for the production of most delicious rice Minamiuonuma Koshihikari.

On the contrary, at the Seto inland sea (sea between Shikoku and Chugoku in Japan) district, especially middle part of the Seto inland sea between Okayama and Kagawa P(ectures, thunder is very rare, once in 5 years. The(ore no NOx is produced by thunder at this district. Fish industry of this district was destroyed almost completely since the supply of NOx was stopped by NOx elimination law. These facts indicate that NOx is playing a very important role for the protection of global warming and production of foods.

3.1. NOx elimination should be stopped

Large amounts of NOx are produced when large amounts of fossil fuel are burned. The amount of NOx produced is ca. $2.5x10^9$ tons in the whole world. To eliminate $2.5x10^9$ tons of NOx, equimolar 1.13 billion tons of ammonia are used. To make 1,13 billion tons of ammonia, 0.2 billion tons of hydrogen gas are used. To make 0.2 billion tons of hydrogen, 0.6 billion tons of butane are used. As the result, 1.76 billion tons of CO_2 are released. If NOx elimination is stopped, 1,76 billion tons of CO_2 release can be stopped. Namely, 44 (= 1.76x25)billion tons of CO_2 can be fixed.

3.2. Stopping of drainage treatment

Drainage contains nutrient N and P. To treat drainage, huge electricity is used. To make this electricity, 0.60 million tons of fossil fuel are used in Japan. If we stop the drainage treatment, we can save the release of one million tons of CO_2. Each house need not pay drainage treatment fee 20 $ per month. Ocean, field and wood dumping of drainage are encouraged.

By stopping of drainage treatment and NOx elimination at burned gas, and by releasing of 2 million tons and nutrient P 0.5 million tons, 50 (= 2x25) million tons of CO_2 can be fixed and fish 20 million tons of NOx can be produced in Japan. By insufficient supply of nutrient N caused by NOx elimination law, fish industry suffered critical damage at Kuroshio (poor nutrient N. P) running sea especially at the Seto inland Sea district where no thunder and no supply of NOx are given. Tuna (maguro), Bonite (katsuo), Sardine (iwashi), Bream (tai), Mackerel (saba), Octopus (tako), Sea eel (anago), and Oyster (kaki) decreased to 20 %. Sea weed (nori) decreased to 0 %. Many fishermen lost job. Fish price increased five times and fish became much expensive than meat now. We Japanese can alive longest by eating fish as main protein source. Because fish contains hyaluronic acid, glucosamine, and chondroitin which are the precursors of anti-aging reagents (26,27,51-58). We Japanese may lose long life record [Men 80.50 (third), women 86.63 (top)] from the fact that fish production was reduced remarkably by the NOx elimination law.

NOx produced by burning increases CO_2 assimilation and food production (7). Prof. Ozaki demonstrated how fish production changed, how grain production changed, how CO_2 fix changed, how GDP changed, and how GWPR (CO_2 emission/ CO_2 fix) changed.

4. Method to fit Paris agreement for protection of global warming (16)

The data of CO_2em (CO_2 emission), NOx (NOx emission), fish production, CO_2f (CO_2 fixing by plankton used for fish production), Grain, CO_2g (CO_2 fixing used for grain production), CO_2t (CO_2 used for Tree Grass production), population, and CO_2 increase of 28 countries are shown in Table 1. (16)

Table 1 CO_2em, NOx, Fish, CO_2f, Grain, CO_2g, CO_2t, Population, and CO_2 inc of countries

Country	CO_2em Billion t	NOx hm t	Fish m t	CO_2f hm t	Grain hm t	CO_2g hm t	CO_2t m t	Popula-tion hm	CO_2 inc hm t
World	51	14.4	160	188	33	66	256	76	180
China	1.96	4.25	81.5	16.3	5.57	11.2	100	13.5	0
United S	5.1	2	5.5	1.1	4.4	9	51	3.1	0
India	2.46	1	10.5	2.0	2.95	6	28	13	-9
Russia	1.96	0.63	4.9	0.98	0.92	0.9	32	1.43	-12
Japan 2019	1.25	0	4.54	0.92	0.04	0.08	3	1.27	8

Japan 1980	0. 8	0.5	12	2.4	0.08	0.16	3	1.27	2.6
Germany	0.78	0	2.7	0.05	0.47	0.9	3.5	0.83	5
Iran	0.96	0.25	0.7	0.14	0.18	0.36		0.80	
Canada	0.56	0.22	8.7	0.17	0.51	1.02	94	0.37	- 88
Indonesia	0.50	1.97	23.2	4.6	0.44	0.89	14	2.39	- 9
Mexico	0.47	0.2	1.5	0.3			1.9	1.23	
U. K	0.40	0.16	0.04	0.08	0.33	0.66	7	0.80	
S Africa	0.40	0.17	0.6	0.12	12	24	1.2	0.33	
Italy	0.35	0.14	0.2	0.04	0.16	0.3	3	0.60	0.5
France	0.33	0.013	0.6	0.12	0.52	1	8	0.67	-5
Poland	0.30	0.09			0.32	.64	5	0.38	-2
Thailand	0.28	0.11	1.5	0.30	0.38	0.076	0.5	0.63	-2.2
Spain	0.26	0.10	1.3	0.26	0.21	0.042	2.6	0.46	0
Egypt	0.23	0.7	3.3	0.66	0.0.3	0.6		0.94	
Vietnam	0.21	0.7	6.4	1.2	50	1	3	0.86	-1
Argentin	0.19	0.01	1.8	0.36	1.02	2.8	2	0.25	
Pakistan	0.17	0.67	0.3	0.06	0.38	0.7	7.9	1.98	-5
Australia	0.13	0.025	0.2	0.04	0.70	0.65	3	0.25	-1.6
Philippin	0.11	0.045	0.90	0.27	0.54	0.1	3	0.92	-1.9
Nigeria	0.09		0.7	0.013	0.26	0.5		1.94	
Columbia	0.08	0.003	0.6	0.12	0.08	1.1		0.50	
Malaysia	0.028	0.11	1.6	0.32	0.02	0.4		0.28	
Netherland	0.01	0.16	0.3	0.06	0.08	0.018		0.17	

4.1. CO_2

Emission; 360 hm tons of CO_2 was produced in the world in 2016 by the burning of 140 hm tons of fossil. The CO_2 emission data of many countries are obtained from statistic. To protect global warming, we must fix CO_2 in the same amount as that of the emitted CO_2. Since we are fixing 283 hm tons of CO_2, 142 hm tons of CO_2 is increasing. We must fix 142 hm tons of CO_2 by proportion of emission of each country. The responsible amount of each country is calculated. The responsible amount can be calculated as Emission amount x 142/360 (0.397) . Each country must clear their CO_2 responsibility by either decrease of CO_2 emission or increase of CO_2 fixing.

4.2. NOx

The amount of NOx is estimated from the fact that NOx is produced about 1/25 of produced CO_2. When 1 ton of CO_2 is produced, 1/25 tons of NOx is produced in the burning process.

Many governments such as United State, Japan, Germany, United Kingdom, and France consider NOx as pollution gas and eliminate NOx by the reaction with ammonia. The(ore, CO_2 assimilation is retarded very much. In other words, CO_2 fixing is retarded very much and global warming is accelerated very much. The amount of NOx is so high that global warming progress proceeds very fast. For the production of ammonia, much fossil is used and much CO_2 is produced.

4.3. Fish

Fish eats ca. 20 times plankton of its weight. CO_2p: Same weight of CO_2 is fixed in the growth of plankton. The(ore, 20 times of fish weight CO_2 is estimated to be fixed.

4.4. Grain

33 hm tons of grain is produced.

4.5. CO_2g

Two times weight of CO_2 is fixed in the production of grain. From 66 million tons of CO_2, 33 million tons of grain is produced.

4.6. Tree grass

From 225 million tons of CO_2, 225 billion tons of tree and grass are estimated to be produced.

4.7. Fish

From 40 billion tons of plankton, 2 billion tons of fish are produced. 1/3 tons of fossil give 1 ton of CO_2. One ton of CO_2 produces 1/25 tons of NOx in the burning process. In the CO_2 assimilation process, 1 ton of CO_2 reacts with 18/44 tons of H_2O using 1/25 tons of NOx. CO_2, Grain, and Fish production are obtained from statistic.

The weight of Plankton is estimated from the fact that sardine eats 10 times plankton of his weight nd Tuna (maguro) eats 10 times sardine of his weight. Then we estimated that fish eats 20 times plankton of his weight in average.

4.8. Grain

From 66 hm tons of CO_2, 33 hm tons of grain are produced. CO_2 fixed in the production of grain is thought to be double of grain. CO_2t (CO_2 used for the production of tree and grass): CO_2t is obtained from the formula of the weight of CO_2 – the weight of plankton and Grain. CO_2, Grain, and Fish productions are obtained from statistic.

China emitted 106.4 hm tons of CO_2. The CO_2 res is 41.92 hm tons. And emitted 4.26 hm tons of NOx. China produced 0.794 hm tons of fish. China fixed 15.88 hm tons of CO_2 by plankton growth. China produced 5.57 hm tons of grain and fixed 11.2 hm tons of CO_2. China has a possibility to fix 100 hm tons of CO_2 by tree grass CO_2 assimilation at 9.98 m km^2 area. United Sate emitted 51.0 hm of CO_2. CO_2 res is 20.0 billion tons, emitted 2 hm tons of NOx, produced 0.055 hm tons of fish, and fixed 0.1 hm tons of CO_2 by plankton growth. United state produced grain 4.4 hm tons of grain and fixed 9 hm tons of CO_2. United state can fix 51 hm tons of CO_2 by tree grass CO_2 assimilation at 5.172 m km^2 area.

India emitted 24 hm tons of CO_2. India fixed 2 hm tons of CO_2 by plankton growth for the production of 0.105 hm tons of fish. India produced 2.96 hm tons of grain. India can fix 32 hm tons of CO_2 by tree grass CO_2 assimilation at 3.287 m km^2 area.

Japan produced 12.5 hm tons of CO_2. The CO_2 res is 4.92 tons and emitted 0.5 hm tons of NOx. Japan produced 0,047 hm tons of fish and fixed 0.94 hm tons of CO_2 by plankton growth. Japan produced 0.1 hm tons of grain and fixed 0.24 hm tons of CO_2. Japan can fix 3.3 hm tons of CO_2 by tree grass assimilation at 0.378 m Km^2 area. Total 4.48 (= 0.94+0.24+3.3) hm tons of CO_2 can be fixed. But Japan cannot fix 8.02 (= 12.5-4.48) hm tons of CO_2 at his own land. To eliminate the remaining 8.02 hm tons of CO_2, Japan should fix CO_2 at its surrounding sea by plankton CO_2 assimilation because the area is narrow.

United Kingdom produced 4 hm tons of CO_2. United Kingdom can fix 0.1 hm tons of CO_2 by plankton, 0.4 hm tons of CO_2 by grain production, and 2.4hm tons of CO_2 by grass tree production. Total 2.9 hm tons of CO_2 can be fixed. United Kingdom has the duty to eliminate the remaining 1.1 hm tons of CO_2

Italy produced 3.5 hm tons of CO_2. Italy can fix 0.7 hm tons of CO_2 by plankton, 0.3 billion tons of CO_2 by grain production, and 0.3 hm tons of CO_2 by tree grass production. Total 1.3 billion tons of CO_2 can be fixed. Italy must decrease the remaining 2.2 hm tons of CO_2.

Japan, United Kingdom, and Italy cannot fix CO_2 at their countries because the areas are narrow. Japan emitted $1.2x10^9$ k tons of CO_2 in 2015. Japan has an area of $3.8x10^5$ Km2. Fixable CO_2 is $3.3x10^8$ k tons. The increased net amount of CO_2 in Japan is $9x10^8$ k tons. Japan, United Kingdom, and Italy are increasing CO_2. These 3 countries are surrounded by sea. These countries must decrease CO_2 by Plankton CO_2 assimilation at sea. Total CO_2 emission of the world is $3.6x10^{10}$ kt. We must decrease CO_2 emission by the promotion of plankton CO_2 assimilation by using NOx given by nature.

4.9. Method to decrease CO_2 14.2 billion tons

Paris Agreement asks us no increase of CO_2. We must fix the same amount of CO_2 as that generated by CO_2 emission. The world is emitting 36 billion tons of CO_2, while it is fixing 21.6 billion tons of CO_2. The(ore, 14.2 billion tons of CO_2 is increasing. We must fix 14.2 billion tons of CO_2. On the other hand, the world is emitting 1.44 billion tons of NOx. About half of emitted NOx is eliminated by ammonia and 0.72 billion tons of NOx are released as it is. One ton of NOx can fix 25 times amount [18.00 (= 0.72x25) billion tons] of CO_2. The(ore, if 0.72 billion tons of NOx are not eliminated, billion tons of CO_2 can be fixed.

We must decrease 14.2 billion tons of CO2. 14.2 billion tons of CO2 is assigned by proportion of emission of each country. The CO2 res (Responsible amount of CO2) can be calculated as the net Emission amount x 14.2/36 (0.397)

The responsible CO_2 of United State is 20 billion tons. USA emitted 51.0 billion tons of CO_2 and 2 billion tons of NOx. To eliminate 2 billion tons of NOx, 1.13 billion tons of ammonia is necessary. To make 1.13 billion tons of ammonia, 0.2 billion tons of hydrogen gas is required. To make 0.2 billion tons of hydrogen, 0.64 billion tons of butane is required. As the result, 1.76 billion tons of CO_2 is released. If NOx elimination is not done, 1.76 billion tons of CO_2 can be saved and 50 billion tons of CO_2 will be fixed. Every plant grows well and produces grain, fish, and grass well. Fixation of the responsible 20 billion tons of CO_2 should be done.

The NOx concentration limit rule of exhaust gas of car determines the fuel efficiency. By loosening the concentration limit, 20 % of fuel efficiency elevates and 0.2 billion tons of CO_2 will be saved. By the effective use of NOx and NP in the drainage, assimilation of 0.5 billion tons of CO_2 is accelerated, and production of grain, fish, and meat will increase.

Japan is emitting 1.25 billion tons of CO_2. The CO_2 res is 0.495 billion tons. 0.1 billion tons of CO_2 is emitting for the elimination of NOx and 0.1 billion tons of CO_2 is emitted for the drainage treatment. If these treatments are stopped, emission of 0.2 billion tons of CO_2 is saved and concentration of N, P increases so that CO_2 assimilation is accelerated and 0.5 billion tons of CO_2 will be fixed. In addition, 0.7 (= 0.1+0.1+0.5) billion tons of CO_2 is decreased. The decrease of 0.7 billion tons of CO_2 results in better improvement by 0.205 billion tons than the responsible 0.495 billion tons which can fit Paris agreement. Japan restricting rice production area with 11 million hectare (36% of total rice field) is inhibited to plant. If we cultivate rice in all fields, 14 million tons of CO_2 can be fixed. If we cultivate two crops of rice and wheat at the same field in a year, we can fix 30 million tons of CO_2.

In Japan, a very special law about the garbage incinerator was set up in 2002. By the reason much NOx is produced at lower temperature. By this rule, the incinerator must be controlled at higher temperature than 800 °C by adding excess fuel to keep higher temperature. Operation of this high temperature incinerator results in the unfavorable use of much excess fuel releasing much CO_2. For the construction of new incinerator, great amounts of CO_2 are produced. For the transportation of garbage and destroyed houses, 0.1 billion tons of CO_2 are generating. Bonfire was inhibited by the reason that bonfire produces NOx. By eliminating this law, fixation of 0.1 billion tons of CO_2 will be accomplished.

4.10. Plankton photosynthesis and fish production

Seventy percent of the earth is covered by sea. 70% of CO_2 assimilation is carried out at sea. 1.5 billion years ago, fish did not appear. Plankton grows and oil is formed as fossil of plankton. Plankton grows infinitively when nutrient N and P is present at any condition. Sea water contains much N and P. They are consumed by plankton and the concentration of N, P at the surface became poor. Fish appeared around 1.5 billion years ago. Fish grows by eating plankton. Fish grows at plankton-rich sea. Three big fishing oceans were north Atlantic ocean, north Pacific ocean, and west side sea of south America. At these seas, counter currents give rich N and P to the plankton.

The world fish industry and CO_2 fixing changed very much since 1980 by the supply of NOx produced by burning of fossil. World fish production in 2016 increased to 200 million tons, about double of 93 million tons in 1997. China,

Indonesia, India, and Vietnam reported 79.38, 22.21, 10.11, and 6.21 million tons of fish catch, respectively, increasing fish production very much.

China, Indonesia, India, Vietnam do not eliminate NOx and do not do drainage treatment. They use NOx and excreta as it is for production of plankton and fish. The(ore, fish production increased remarkably even at the district where N and P would not be supplied by counter current of nutrient-rich deep sea water and nutrient poor shallow sea water would be kept. China produced 16.77 millions tons of fish in 2002 and 79.38 million tons of fish in 2016. This is a huge Increase. China produced 0.4 billion tons of NOx. This NOx is released to air and dissolved in rain and give enough nutrient nitrogen to sea, lake, and river to grow 1.6 billion tons of plankton and 79.38 million tons of fish. 0.4 billion tons of NOx became enough fertilizer for the production of 0.44 billion tons of grain. This amount of NOx contributed to the growth of tree and grass. These three CO_2 assimilation actions, *i.e*., plankton formation, grain production tree, and grass growth, fixed 10 billion tons of CO_2 contributing to the protection of global warming.

Japan produced 16 million tons of fish, the top in the world in 1960. But Its fish production decreased to 4.64 million tons reported as the 7th place in 2016. This is a huge decrease. Japan is eliminating 3 million tons of N and P since 1980. The(ore, NP concentration of sea decreased remarkably. Plankton can not grow at this low concentration. The(ore fish decreased. 12 million tons of fish were not produced in recent years. Especially, production of Pacific Saury (Sanma) decreased to $1.5x10^5$ tons in 2014 compared with $3x10^5$ tons in 2006. Sardine (Iwashi) also decreased to 0.5 million tons in 1988 compared with 4.81 million tons in 2014. These two fish feat plankton. Production of Tuna (Maguro) which eat Pacific Saury and Sardine decreased to 0.017 millions tons in 2014 compared with 0.16 million tons in 1961. The production of Bonto (katsuo), Bream (tai), Seaeel (anago), Salmon (sake), Mackerel (saba), Octopus (tako), Squid (ika), Eel (unagi), and Sea eel (anago) decreased to 0.16 million tons in 1969 from 0.017 million tons in 2014. Production of Asari decreased to 0.001 million tons in 2016 from 0.1 million tons in 1980. Production of Sea weed (Nori) also decreased to 0.01 billion sheets from 1 billion sheets.

Fish production is proportional to population and the amount of excreta. Shrimp production by excreta is popular in Vietnam, India and Indonesia from which 31000, 30000 and 25000 tons, respectively, of shrimps are exported to Japan in 2015. Peru, Norway, and Chile produce much fish by N, P caused by counter currents of nutrient-rich deep sea water with nutrient poor shallow sea water.

Fish production is proportional to CO_2 fixed by CO_2 assimilation at sea. The country having high fish production is the country which has done CO_2 fixation at the high level. 20 times of CO_2 of fish production are fixed by plankton CO_2 assimilation.

China produced 79.38 million tons of fish in 2016. This means that China fixed 1.6 billion tons of CO_2 by plankton CO_2 assimilation. This is a huge amount. This is 1/ 6 of 10 billion tons of CO_2 produced at China. China is the biggest CO_2 producing country.

This data indicates that plankton CO_2 assimilation is playing a significant role in the fixation of CO_2 and protection of global warming.

Decrease of 12 million tons of fish at Japan means decrease of 240 million tons of CO_2 in its fixation. If Japan stops elimination of 3 million tons of N and P, Japan can fix 60 million tons of CO_2 and can produce 12 million tons of fish

Decrease of a half-million ton of fish at Seto inland sea (2) means decrease of 10 million tons of CO2. Fixation of 8x108 tons of CO2 which is induced from the formula of 12.4x108 - 4.4x108, must be done at sea. For this purpose, 5.77x108 km2 (8x108/14.2) sea area is necessary. We must do CO2 assimilation at 8.77x108 km2 sea. This is a 2.3 times wide area of Japan.

4.11. NOx concentration of many countries

When fossil is burned, carbon dioxide is emitted and ca. 1/25 amount of NOx compared with produced CO_2 is also produced as the byproduct. Concentration of NOx in exhaust gas at the electricity plant is ca. 1.6 g/1kWh. Some countries do NOx elimination with ammonia while other countries do not do NOx elimination. The selection if NOx elimination is done or not gives a significant influence on economy, electricity price, import, export. agriculture, fish industry, and GDP.

China emitted 10.64 billion tons of CO_2. The content of NOx in exhaust gas is 1.6 g/kWh electricity generation. The electricity generation of China is 15422 billion kWh, NOx emission of China is 984 (= 2x1.6x15422) million tons. About

a half of fossil is burned at electricity plant. The other half is burned at other furnaces like iron and chemistry industries. The(ore, double amounts of NOx are produced at all furnaces. Electricity price at China is 8 c/kWh.

Japan emitted 1.25 billion tons of CO_2. Japan did not do NOx elimination before 1970 and NOx content was 1.6 g/kWh and 32.1 million tons of NOx were released. In 1980, Japan government set up a very strict law to eliminate NOx and Drainage NP. Then the NOx concentration in exhaust gas decreased to 0.1 g/kWh and NOx emission decreased to 0.4 million tons.

The other data about the NOx concentration in exhaust gas are shown as follows: [country (g/kWh); China (1.6), USA (0.5), India (1.6), Japan (1.6 in1970 and 0.1 in 2016), Canada (1.3), Germany (1.0), France (1.9), S. Korea (1.6), UK (1.3), and Italy (0.5), respectively.

These countries produced NOx as follows: [country (million tons of NOx)]; China (984), USA (192), India (86), Japan (0.4), Canada (52.4), Germany (24.4), France (38), S. Korea (34.2), UK (18.4), Italy (5.6).

As one molecule of NOx can fix 25 molecules of CO_2. These countries can fix CO_2 as follows: [country (billion tons of CO_2 which were calculated by the formula of the above each NOx datax25x44/30)]; China (36.08), USA (7.04), India (3.15), Japan (0.147), Canada (1.91), Germany (0.894), France (1.393), S. Korea (1.25), U. K. (0.674), and Italy (0.205).

4.12. Electricity price of many countries

Here, the electricity prices used in many countries having high and low electricity prices are shown.

4.12.1. High electricity price country

The names of countries (its electricity prices using c/kWh) are shown as follows: Japan (20-24), Germany (32), France (19), UK (15.4), and Italy (28). At these countries, NOx elimination is carried out. The most severe country is Japan in NOx elimination. The NOx con of Japan is 0.1 g /kWh and its electricity price (20-24 c/kWh) is high.

4.12.2. Low electricity country

The names of countries (its electricity prices using c/kWh) are shown as follows: China (1.6-4.5), India (5.6), and S. Korea (8.4). The countries which do not do NOx elimination can provide low price electricity. The countries with these low prices are increasing CO_2 assimilation, CO_2 fixing, and food production, as shown in the case of China (1.6-4.5 c/kWh).

Low price electricity is very favorite for the production of goods and thereby the countries with low price electricity can export many goods to countries with high electricity price. For example most of electricity generation is produced in China and China products have been exported all over the world. Consequently, China is increasing GDP.

The countries with high electricity price are doing NOx elimination by use of ammonia. By elimination of this NOx elimination process, we can reduce 0.1 billion tons of CO_2 production. Japan eliminates NOx completely. The(ore, the electricity price (20-24 c/kWh) of Japan is 2.5 times higher than that of S. Korea (8.4 c/kWh). Even through both countries are generating electricity using fossil imported from abroad. Construction cost plus fossil cost are added for elimination of NOx. Thus the electricity price increases. Developed countries could lower their electricity prices if NOx elimination could be stopped.

4.13. Fish production and CO_2 fixation by plankton (13,14, and 18)

When we look at fish production in the world. China emitted 10.4 billion tons of CO_2 and 492 million tons of NOx. They do not eliminate NOx and use NOx as a promotor of plankton growth. 79.38 million tons of fish is caught and 1.98 billion tons of CO_2 is fixed. India caught 10.11 million tons of fish. Japan caught 13 million tons of fish in 1970. But since the elimination of NOx was done, the fish catch in Japan decreased to 4.64 million tons. Thus, the CO_2 fixation by plankton decreased to 92.8 million tons in 2016 from 250 million tons in 1970

When we look at fish catch regions of Japan, the west side of Kyushu, Nagasaki, Saga, Fukuoka, and Kagoshima p(ectures. East China sea exits in the west of these p(ectures. Large amounts of nitrogen are provided by Yangtze River and the concentration of nitrogen in East China sea is very high and large amounts of plankton are growing. The(ore, a lot of fish are produced at this sea. East China sea is a well known fishing center in the world now.

4.14. Influence of NOx elimination on GDP growth rate

CO_2 assimilation is the most important reaction for all biology on the earth. NOx is a promotor of plant growth involving CO^2 assimilation. The(ore, NOx elimination results in a great damage on not only the growth of plant and plankton but also production of fish, grain, grass, and tree.

For the elimination of NOx the reaction of NOx with ammonia is used. By this reaction, precious fertilizer is destroyed by another precious fertilizer NH_3. This is a tremendous loss.

- The countries who do not do NOx elimination like China (NOxcon = 1.6 g/kWh, GDP = 6.92%), India NOxcon = 1.6 g/kWh, GDP = 7.10%), and S. Korea (NOxcon = 1.6 g/kWh, GDP = 2.8%) can boost high GDP growth rates.
- The countries which do this reaction with ammonia for NOx elimination like USA (NOx con = 0.5 g/hWh, GDP = 1.38%), Japan (NOx con = 0.1 g/kWh, GDP = 1.01%), Germany (NOx con = 1.0 g/kWh, GDP = 1.85%), UK (NOx con = 1.3 g/kWh, GDP = 1.8%), and Italy (NOxcon = 0.5 g/kWh, GDP = 0.88%) are consuming much fossil fuel for elimination of NOx. The(ore, the electricity prices of such countries electricity price are higher than those of the countries without NOx elimination so that CO_2 assimilation is retarded. Agriculture and fish industries are retarded. Japan did no NOx elimination before 1970. The GDP of Japan was 8.0 in 1970. .Japan started NOx elimination in 1980, then plankton production was destroyed and 13 million tons of fish were not produced. About 1 million fishermen lost job. As the fish price res is 3000 dollar/t, 390 (= 3000x13) billion dollars were lost. The DGP growth rate of Japan now is 1.01%.
  The country whose electricity price is low can produce a lot of goods with low price. Thus, industries can progress and the DGP growth rate becomes higher.
- The countries which do not do NOx elimination: 1) They need not fossil to eliminate NOx. 2) They can have enough NOx and promote CO_2 assimilation. 3) Their electricity prices are low. 4) They can produce much fish and grain. 5) They can get high GDP growth rate as shown in China (6.92%) and India (7.10%).
  The countries which do NOx elimination: They show low GDP, as exemplified in USA (1.48 %), Germany (1.85%), UK (1.8%), Japan (1.03 %), and Italy (0.88%).

5. Effect of NOx elimination on electricity price, fish production, GDP an protection of global warming (19)

Many developing countries like USA, Japan, Germany, United Kingdom, and France set up laws to inhibit the release of NOx in the air. As the result, CO_2 assimilation and CO_2 fixation are reduced remarkably. The growth of plant and plankton is reduced significantly. Fish production in such countries is also reduced remarkably. Some other countries welcomed NOx and excreta as promotors of CO_2 assimilation. In these countries, the growth of plankton and grain growth is promoted. Fish production increases.

Thousands of papers have been published about the toxicity of NOx and no papers indicated that NOx is fertilizer.

When we look at plankton, a number of papers including 20 nature-related papers teach us that plankton and supply of NP are playing a significant role in the control of climate, CO_2 assimilation, and fish production. Plankton reduced 95 % CO_2 concentration to 250 ppm in 3 billion years

Prof. Ozaki is insisting that NOx elimination should be stopped and NOx elimination law should be eliminated. Namely, NOx should be released to air as it is. Waste water should be released as it is to ocean, field, and forest to promote CO_2 assimilation to help fixation of CO_2.

When we look at fish production of world (6-15), China, Indonesia, India, and Vietnam caught 79.38, 22.21, 18.11, 18.11, and 6.21, respectively, million tons of fish. These countries use NOx and excreta as they are for production of plankton and fish. The(ore, fish production increased remarkably. China industry is promoted. As the result, production of CO_2 and NOx increased rapidly and production of fish increased rapidly.

The data of CO_2em (CO_2 emission), NOxcon (NOx concentration in exhaust gas), NOxem (NOx emission) electricity, price, fish, CO_2f plankton, and GDP of 11 countries are shown in Table 2

Table 2 The data of CO_2 em (CO_2 emission) , NOxcon (NOx concentration in exhaust gas), NOxem (NOx emission) electricity, price, fish, CO_2 f plankton, and GDP of 11 countries

Country	CO_2em hm t	NOxcon g/kWh	NOxem mill t	Electricity billkWh	pri ce c/kWh	Fish mill t	CO_2f plankton hm t	GDP rowth rate
China	106.4	1.6	984	154220	1.6-4.5	79.38	19.8	6.92
India	24.5	1.6	86	13920	5.6	10.11	2.0	7.10
S Korea	5.8	1.6	34.2	5380	8.1	3.33	0.083	2.8
USA	51.7	0.5	192	43670	12	6.05	0.50	1.48
Japan (2016)	12.5	0.1	0.4	10080	24	4.64	0.11	1.03
Japan (1970)		1.6	64.2			13.00	3.25	8.0
Canada	5.5	1.3	52.4	6520	8.1	1.05	0.25	1.40
Germany	7.7	1.0	24.4	6270	32	0.29	0.07	1.85
France	3.2	1.9	3.8	5570	19	0.91	0.18	1.20
UK	4.0	1.3	18.4	3560	15.4	0.91	0.002	1.8
Italy	3.5	0.5	5.6	3880	28	0.34	0.008	0.88
Russia	17.6				17	4.61	1.15	-0.22

6. The effect of NOx elimination on electricity price, fish production and GDP (29)

The effects of increase of NOx and CO_2 on grain and fish production, protection of global warming, and climate is summerized here. The data of CO_2 emission, CO_2 fix, NOx emission, Grain production, GrainJa (Grain production of Japan), GrainInd (Grain production of India), Fish (Fish production of the world), FishJa (Fish production of Japan, GWPR, and GDPgJ (GDP growth rate in Japan) are shown in Table 3.

Table 3 The data of CO_2 em, CO_2 f, NOxem, Grain production, GrainJa, GrainInd, Fish, FishJa, GWPR, and GDPgJ

Year	CO_2em hm t	CO_2f hm t	NOxem hm t	Grain hm t	GrainJa m t	GrainInd hm t	Fish m t	FishJa m t	GWPR	GDPgJ
1900	20	20	0.8						1	
1920	30	30	1.2						1	
1940	50	50	2				2		1	
1960	100	100	4			0.7	35	3.5	1	6
1970	150	150	6	11	13	1		6.2	1	7
1975	170	170	6.8	12	10			9.5	1	6.5
1980	200	150	8	14	10	1.2	45	11	1.33	6
1985	210	140	8.4	15	9.5		105	12	1.33	1
1990	220	140	8.8	17	9	1.7	110	9	1.5	1
2000	250	150	10	22	8.5	2.2	140	8.5	1.57	1
2005	270	160	10.8	21.5	8.2		155	5	1.68	1
2010	300	170	12	23.5	8	25	165	4	1.76	1
2017	360	220	14.4	27	7.5		200	3.2	1.63	1

The weight of vegetation of the world increased about 2 times since the industrial revolution. The area of tropical rainforest increased very much since these several 10 years.

The total weight of wood is said to be 80 billion tons. The reason is due to the increase of NOx. The increase of CO_2 and NOx production increased the CO_2 assimilation. The increase of CO_2 assimilation increased the production of grain and fish. The production of grain in 1960 was 0.85 billion tons but it increased 3 times to 2.6 billion tons in 2010.

The production of grain in India increased 5 times from 1950 to 2010, as shown by the data of 0.5 (1950), 0.7 (1960), 1.0 (1970), 1.2 (1980), 1.7 (1990), 2.2 (2000), and 2.5 (2010) tons. The CO_2 emission now reaches 24 billion tons. The NOx emission increased to 1 billion tons. The increase of NOx contributed to the production of 2.5 billion tons of grain. Population of India increased 3,3 times to 1.25 billion in 2014 from 0.38 billion in 1951. The grain production increased 5 times.

Fish production of the world increased as follows: 20 (1940), 35 (1960), 45 (1980), 80 (1990), 130 (2000), 130 (2010), and 200 (2016) million tons. China increased fish production 57 times to 2017 from 1960: 1.5 (1960), 2 (1970), 3 (1980), 4 (1990), 16.3 (1997), 16.3 (2002), 78.4 (2016), and 85.3 (2017) million tons. China produced 10.6 billion tons of CO_2 and 4 billion tons of NOx. 4 billion tons of NOx contributed to the increase of nitrogen concentration of sea, growth of plankton, and increase of fish production.

China produced 4 billion tons of NOx. This NOx increased nitrogen concentration of sea. East China sea is now the top fishing area. The three big fishing seas were north Pacific ocean, north Atlantic ocean, and west of South America. These seas are rich in nutrient NP caused by counter current of NP rich deep sea water so that the NP-poor surface sea water is improved.

When CO_2 concentration increases, the yield of grain increased about 30 %. The concentration of CO_2 at green house is kept at 1000-1500 ppm. Normal concentration of CO_2 in the air is 400 ppm. The(ore, the concentration at green house is 2.5-3.75 times higher than that of CO_2 in the normal air.

The tree in densely populated cities grows much more rapidly than that in normal cities. NOx is a very effective promoter of CO_2 assimilation. The(ore, the production of grain and fish increased proportionally to the increase of CO_2 and NOx. Here, are summarized the amounts of emitted and fixed CO_2 reported in 1900 to 1960 which are shown in the order of the data (billion tons) of emitted CO_2 and fixed CO_2, and (year): 20 & 20 (1900), 30 & 30 (1920), 50 & 50 (1940), 10 &10 (1960), After 1980, the amounts of CO_2 emission and fixation become different from each other. The amount of CO_2 fixation becomes smaller than that of CO_2 emission. The data obtained after 1980 are shown in the same order: 20 & 18 (1980), 22 & 14 (1990), 25 & 16 (2000), 30 &16 (2010), and 36 & 22 (2016), The amount of CO_2 fixation is less by 14 billion tons than that of CO_2 emission in 2016. This is caused by the elimination of NOx and NP. The CO_2 assimilation is retarded by elimination of NOx and NP.

6.1. Heat balance of earth

On the earth, 14 billion tons of fossil fuel is burned. As the result, $3.6x10^{10}$ tons of CO_2 is produced and $13.2x10^{16}$kcal of heat is generated. When we consider the heat produced by animal respration, $9.45x10^{15}$ (= $7.4x10^{15}$ kcal x 4.6/3.6) kcal of heat is produced. The earth is also warmed by the heat of atomic energy. Uranium produces $2x10^{15}$ kcal of heat. Electricity generation capacity of the world is 16868 Tetra watt h. Electricity generation by atomic energy is 2086 Tetra watt h. The(ore, $7.4x10^{15}x2986/10868 = 2.02x10^{15}$ kcal of heat is evolved by atomic energy.

The earth is also warmed by the heat evolved by animal. Human being eats 1000 kcal of food every day and releases 1000 kcal of heat every day. Population of the world is 7.6 billion. The(ore human being is releasing $1000x365x76x10^{15}$ = $2.8x10^{15}$ kcal in one year. Animals other than human being, such as caw, bird, whales, and seal, are producing heat. We can estimate the same as $2.8x\ 10^{15}$ kcal of heat generated by human being. The(ore, the total heat involving fossil burning, atomic energy, human being, and other animals is calculated to be $15.02x10^{15}$ [= $(7.4+2.02+2.8+\ 2.8)x10^{15}$] kcal. We must absorb $15.02x10^{15}$ kcal by CO_2 assimilation.

44g (1 mole) of CO_2 and 18 g (1 mole) of water absorb 114 kcal sun's heat to be converted to carbohydrate and 32 g oxygen. If 5.1 billion tons ($5.1x\ 10^{16}$ g) of CO_2 do CO_2 assimilation, $13.2x10^{14}$ kcal (= $114x51x10^{15}/44$) can be absorbed.

CO_2 assimilation must be promoted by stopping of NOx elimination and by stopping waste water purification. By stopping NOx elimination, 1.44 billion tons of NOx can be fixed and 3.6 (= 1.44x 25) billion tons of CO_2. The amount of N.P in drainage is around 0.05 billion tons. By using this 0.05 billion tons of N.P, we can fix 1.25 (= 0.05x25) billion tons

of CO_2. In total, 4.85 billion tons of CO_2 can be fixed. This means that we can absorb $15x10^{14}$ kcal and thereby the earth can be cooled down.

6.2. Electricity generation should be done by coal

IPCC (Intergovernmental Panel on Climate Change) asking electricity generation by oil and natural gas than coal, because coal generate more CO_2 than oil. But I think coal is better for the generation of electricity to save the consumption of oil (29). Global warming is not caused by CO_2. Global warming is caused by the elimination of NOx and NP which do co-assimilation with CO_2. The amount of the world reserves of coal (162 years) is that of oil (56 years) and natural gas (81 years). We can manufacture many kinds of chemicals and plastics from oil. Oil is more convenient as a transportation fuel. The(ore, oil and natural gas are 3 times more precious than coal. Price of coal is 1/3 of oil. The(ore, we can generate electricity by use of coal at lower price. The price of electricity is very important for the competition of productive industry. The year of oil scare is coming in 50 years. Then we must do liquefaction of coal to get liquid fuel for transportation. In this process, about half an energy of coal is lost. We can enjoy our civilized life longer by saving the consumption of oil and natural gas.

6.3. Solar Electricity generation should be done at no green land

Construction of solar mega systems by the sacrifice of wood is not a clever way. (29). 1 hector 1000 m^2 wood can absorb $3.8x10^6$ kcal of heat and can fix 13.7 tons of CO_2. Heat absorption efficiency of solar system cells is 1/3 of green leaf of tree. Solar system cells cannot fix CO_2. For the preparation of solar cell materials, a large amount of fossil fuel is necessary generating simultaneously much of CO_2, compared with the generation of CO_2 and electricity by burning of fossil fuel. The(ore construction of solar mega systems by the sacrifice of wood is promoting global warming.

1000 m^2 cell can generate 114000 kWh and can save 7.5 tons of CO_2 and can absorb $1.3x10^6$ kcal of heat. For the production of 1000 m^2 cell, 5 tons of CO_2 is produced. Electricity generation should be done at land without green tree. In the house located near forest, air conditioner is unnecessary. But in the house located near solar mega system, air conditioner is necessary at summer. Japan produced 330 billion kWh of solar electricity producing more CO_2 than generation of CO_2 by burning of fossil, Accordingly, the electricity price increased 10%.

Japan is promoting global warming by solar electricity generation by the sacrifice of wood..

7. Complete use of NOx and NP is essential for the increased production of food and protection of global warming (32)

In order to study the reason why global warming is happening, Prof. Ozaki investigated why 14 billion tons of CO_2 is remaining to give global warming. Why fish production of Japan decreased. He investigated CO_2 emission, NOx emission, grain production, fish production, CO_2 fixation, and CO_2 increase of 34 countries. About 38 billion tons of CO_2 is fixed by CO_2 assimilation. Then I found that many developed countries are eliminating NOx. About a half (3.6 billion tons) of produced NOx is eliminated. Then CO_2 assimilation is retarded. CO_2 fixation is also retarded. 14 billion tons of CO_2 is remaining to give global warming. Japan producing 1.25 billion tons of CO_2 and 0.05 billion tons of NOx. Japan eliminating all of 0.05 billion tons of NOx. Then CO_2 assimilation is retarded. Plankton production is retarded. Fish production of Japan decreased to 10 % since NOx elimination and NP elimination of waste water. The(ore, Japan lost 0.012 billion tons of fish production, 0.24 billion tons of CO_2 fixation by plankton CO_2 assimilation. If developed countries stop elimination of NOx and NP in waste water, then 14 billion tons of CO_2 can be fixed. CO_2 emission produced by elimination of NOx and NP is saved. By promotion of plankton CO_2 assimilation by increasing NP concentration at sea, fish production increase and global warming can be protected. Complete use of NOx and NP are essential for the increased production of food and protection of global warming.

The CO_2 emission and CO_2 increase of many countries were investigated to clear the reason why global warming is happening. Why did only Japan decrease fish production while other countries increased fish production? China increased 57 times (13). Several countries cannot fix CO_2 produced at their countries. Japan is the worst country where the amount of CO_2 remained unfixed. Why did Japan become such a country?.

Japan doing NOx elimination most severely (18). Japan is doing NP purification most severely. The CO_2 assimilation is retarded very much. Japan is emitting much CO_2 (0.12 billion tons) for the elimination of NOx and NP. Japan decreased fish production 13 to 2.30 million tons during 1970 to 2015. This indicates 2 billion tons of CO_2 fix decreased during 1970 to 2015.

The data of CO_2 emission, NOx emission, Fish production Grain, CO_2g (CO_2 used for grain production) CO_2t (CO_2 used for tree production), CO_2 increase of 34 countries are shown in Table 4. Unit is hundred million tons (22-24 and 32)

Table 4 The data of CO_2 emission, NOx emission, Fish production Grain, CO_2g, CO_2t, and CO_2 increase of 34 countries

Country	CO_2 em	NOx emi	Fish prod	CO_2f	Grain	CO_2g	Area	CO_2t	CO_2inc
World	360	14.4	2	32	33	66			140
China	106	4.25	0.794	1.59	5.6	11.2	$1.0x10^7$	100	-25
USA	51	2	0.056	0.11	4.4	9	$0.95x10^7$	70	-20
India	24.6	1	0.105	2	2.98	6	$0.32x10^7$	30	-8
Russia	19.6	0.63	0.076	1.52	0.92	0.9	$0.32x10^7$	25	-5
Japan	12.5	0.5	0.023	0.46	0.12	0.24	$0.33x10^6$	3	8
Germany	7.8	0.31	0.002	0.04	0.47	0.9	$0.33x10^6$	3	3
Iran	6.3	0.25	0.047	0.009	0.18	0.36	$1.6x10^6$	6	0
S. Korea	6.1	0.24					$0.97x10^5$	6	0
Canada	5.6	0.22	0.01	0.25	0.51	1.02	$1.0x10^7$	30	-23
Saudi Arabia	5	0.2					$2x10^6$	5	0
Indonesia	5	0.22	0.2	4.4	0.51	1.02	$1.9x10^6$	2	0
Brazil	4.8	0.19					$2x10^6$	6	0
Mexico	4.7	0.2	0.016	0.32			$2x10^6$	4	0
Australia	4.5	0.18					$7.7x10^6$	4.5	0
South Africa	4.1	0.16	0.012	0.24	1.2	2.4	$1.2x10^6$	3	0
UK	4	1	0.16	0.05	0.1	0.2	$2.4x10^5$	2	2
Turkey	3.5	0.16	0.0018	0.33	0.56	1.1	$2x10^6$	3	0
Italy	3.5	0.14	0.035	0.7	0.16	0.3	$2.0x10^5$	0.3	3
France	3.3	0.05	0.035	0.7	0.52	1	$6.4x10^5$	1	0
Poland	2.9	0.11					$4.9x10^5$	3	0
Thailand	2.8	0.11					$5x10^5$	3	0
Spain	2.6	0.1					$5.5x10^5$	2.8	0
Malaysia	2.4	0.1					$3.3x10^5$	2.4	0
Ukraina	2.3	0.1					$5.7x10^5$	2.3	0
Egypt	2.3	0.1					$10x10^5$	2.3	0
Vietnam	2.1	0.08					$3.3x10^5$	2.1	0
United Arab	2	0.08					$0.8x10^5$	2	0
Argentin	1.9	0.08					$1.2x10^5$	1.9	0
Venezuela	1.8	0.07					$1.8 x10^5$	1.8	0
Pakistan	1.7	0.07					$7.9 x10^5$	1.7	0
Netherlands	1.7	0.07					$1.7 x10^5$	1.7	0
Iraq	1.7	0.07					$4x10^5$	1.7	0
Pilippine	1.1	0.04					$3.0x10^5$	1.1	0
Belgium	1	0.04					$30x10^5$	1	0

8. Increase of CO_2 and NOx promote CO_2 assimilation, CO_2 fixation and food production (33)

The increase of CO_2 and NOx production increased the CO_2 assimilation. The increase of CO_2 assimilation increased the production of grain and fish. The production of grain in 1960 was 0.085 billion tons but it increased to 0.26 billion tons in 2010 that is 3 times more than in 1960.

Most of emitted CO_2 is fixed by CO_2 assimilation. The CO_2 increase is calculated based on the formula of CO_2 emission minus fixable CO_2. The CO_2 increase of 13 countries is shown at Table 5

10 K tons of CO_2 can be fixed at1 km^2 of forest and 10 k tons of CO_2 is fixed at 1 km^2 of cultivated land. Then we can calculate fixable CO_2 based on the formula of area Km^2 multiply 10 K tons.

The data of CO_2 emission, CO_2 fixation, NOx emission, Area, Fixable CO_2, Fish, CO_2fpla (), and increase of CO_2 are shown in Table 5. (22-24)

Table 5 CO2 emission, NOx emission, area, Fixable CO2, Fish, CO2 fula, and CO2 increase of 13 countries

Country	CO_2 em bill t	NOx bill t	Area km^2	FixableCO_2 Kt	Fish hm t	CO_2fpla hm t	CO_2 increase hm t
World	36	1.44					142
China	10.64	0.425	$1.0x10^7$	$1x10^{10}$	79.38	19.8	0
USA	5.10	0.2	$9.5x10^6$	$9.5x10^9$	6.05	1.2	0
India	2.46	0.1	$3.2x10^6$	$3.2x10^9$	10.11	2.0	0
Russia	1.96	0.063	$3.2x10^6$	$3.2x10^9$	4.61	1.1	0
Japan	1.25	0.05	$3.8x10^5$	$3.3x10^8$	4.6	0.92	8.7
Germany	0.78	0.031	$3.5x10^5$	$3.5x10^8$	0.29	0.58	4.3
Iran	0.63	0.025	$1.6x10^6$	$1.6x10^6$			6.3
Canada	0.56	0.022	$1.0x10^8$	$1.0x10^{10}$	1.05	0.2	0
Indonesia	0.50	0.02	$1.9x10^6$	$1.9x10^6$	3.7	0.7	0
U. K	0.40	0.016	$2.4x10^4$	$2.4x10^8$	1.6	0.3	1.6
Turkey	0.40	0.016	$7.8x10^5$	$7.8x10^5$	3.2	0.7	3.2
Italy	0.35	0.014	$2.0x10^5$	$3.0x10^8$	0.5	1.0	0.3
France	0.33	0.013	$6.4x10^5$	$8.4x10^8$	0.9	1.2	0

China can produce goods with the cheapest price electricity (1.6-4.3 c/kWh) and China is winning priority of productive industry in the world.

Japan, Germany, UK, and Italy are emitting 1.25, 0.76, 0.4, and 0.35, respectively, billion tons of CO_2. Since these countries have narrow areas, they cannot fix all CO_2 produced in his country. In green forest or cultivated land, 1 Km^2 of area can fix 1000 tons of CO_2. The area of Japan is $3.8x10^5$ Km^2. Fixable CO^2 is $3.8x10^8$ (= $3.8x10^5$x1000), *i.e.*, 0.38 billion tons. The(ore, Japan is increasing 0.87 billion tons of CO_2 which can be calculated by the formula of 1.25- 0.38. Similarly, Germany, UK, and Italy are increasing 0.43, 0.16, and 0.3, respectively, billion tons of CO^2.

The total mount of NOx produced in the world is 1.44 billion tons. China, USA, and India produced 0.425. 0.2, and 0.1 billion tons of NOx, The amount of NOx produced in Japan is 0.05 billion tons and to eliminate this material, 0.01280 billion tons of butane is used for the production of 0.00606 billion tons of H_2 and 0.07480 billion tons of CO_2. If Japan stops NOx elimination, 1.25 (= 0. 05x25) billion tons of CO_2 which is corresponding to 25 times amount of NOx, can be fixed. 1.14 billion tons of CO_2 produced in the world can be completely fixed if the 3 times area ($3.8x10^5$ Km^2) of Japan islands is available for plankton-assisted CO_2 assimilation. In such a case, 0.0745 billion tons of CO_2 can be saved by stopping of NOx elimination. Furthermore, 0.05 billion tons of CO_2 can be saved by stopping NP waste water purification. The generation of total 1.2645 (= 1.14+ 0.0745+0.05) billion tons of CO_2 can be stopped. Japan can produce 0.03 billion fish and Japanese can enjoy anti-aging and long life. (26, 27, and 51-58). If Europe stops the elimination of 0.071 billion tons of NOx and 0.02 billion tons of NP, generation of 1.0 billion tons of CO_2 can be stopped and 0.01 billion tons offish can be produced.

9. Burning of wood increase food production by NOx (37)

Slash and burn agriculture is carried out for thousands of years in the world. Wood is burned and wood turns to the field which can produce crops. The ash produced by burning is said to be effective substance. But the real effective substance is NOx. When 1000 tons of tree is burned, nitrogen in tree changes to NO and N_2 react with O_2 to give NO. Thus, 40 (= 1000/25) tons of NOx is produced and 40 tons of NOx can be used for the growth of 1000 (= 40x25) tons of plant. By burning of something, by cooking of rice, by burning of tree for worming up the room, by burning of straw, by bonfire, by mountain fire, and by fire festival, 25 tons of NOx is produced (4,7, and 36). Decay of tree and timber needs many years. When tree and timber are burned, CO_2 and NOx are produced at the same time. Recycles of carbon and nitrogen are done quickly.

Forest firs of Brazil are now big topics. Brazil government is trying to convert tropical rainforest to agriculture land. $3.8x10^5$ Km^2 of forest is now changing to farm yearly. This kind of action is done at Africa, Russia, Indonesia, and Malaysia. In this process, forest is burned and agriculture land is made. By changing forest to firm, valuable crops and foods are produced. In the process of burning, forest fir can happen. Many people say that this occurrence of fir accidents destroys forest, produces much CO_2, and progresses global warming.

But I think to convert forest to firm land must be evaluated by comparing the merit with the demerit. Slash and burn agriculture has a big merit. Forest firs produce much fertilizer. When 1000kg of dry timber is burned, 1470 (= 1000x44/30) kg of CO_2 is produced and 58.8 (= 1470x1/25) kg of NOx is produced. 1470 kg of CO_2 and 58.8 kg of NOx will produce 1470 kg (= 58.8 kg x25) of plant or grain by CO_2 assimilation.

10. Purification of water and air is promoting global warming and country decline (38)

Burning of fossil is increasing. Production of CO_2 and NOx is increasing. Increased CO_2 and NOx promoted the CO_2 assimilation. Most of CO_2 thus produced is fixed by CO_2 assimilation. But developed countries started purification of water and air by elimination of NOx and NP at around 1980. 0.6 billion tons of NOx and 0.2 billion tons of NP are eliminated. NOx is the main nitrogen fertilizer and NP is the main nitrogen and phosphorous fertilizer. The(ore plant growth is retarded. CO_2 fixation is retarded. CO_2 is increasing. Production of foods like grain, fish, and meat is retarded. The increase rate of DGP decreased. Global warming and country decline are progressing. If developed countries stop NOx elimination by ammonia and close waste water purification station, global warming will stop and country decline will stop.

Table 6 The data of CO_2em, NOx, NOxc, GWPR, and GDP of 13 countries

Country	CO_2 em hm t	NOx hm t	NOxcon g/kWh	Area km^2	FixableCO_2 hm t	GWPR	GDP inc ratio
Word	420	16.8					
China	106.4	4.25	1.6	1.0×10^7	100	1.0	6.9
USA	51.0	2	0.5	9.5×10^6	95	0.53	1.48
India	24.6	1	1.6	3.2×10^6	32	0.76	7.1
Japan (2018)	12.5	0.5	0.1	3.8×10^5	3.7	3.4	1.03
Japan (1980)			1.6			1.5	7.0
Russia	19.6	0.63		$32x10^6$	32	0.61	0.8
Germany	7.8	0.31	1.0	3.5×10^5	3.5	2.2	1.83
Iran	6.3	0.25		1.6×10^6	1.6	3.9	2.6
Canada	5.6	0.22	1.3	1.0×10^8	100	0.06	1,44
Indonesia	5.0	0.2	1.6	$1.9x10^6$	19	0.3	5.2
U. K.	4.0	0.16	1.3	$2.4x10^4$	2.4	1.7	1.8
Turkey	4.0	0.16		$7.8x10^5$	7.8	0.5	-2
Italy	3.5	0.14	0.5	$2.0x10^5$	3.0	1.2	0.88
France	3.3	0.13		$6.4x10^5$	8.4	0.4	1.2

The data of CO_2em (CO_2 emission), NOx, NOxc (NOx concentration at exit gas), GWPR (global warming protection ratio), GDP (GDP increase ratio) of 13 countries are shown in Table 6.

One Km^2 of green land can fix 1000 tons of CO_2. Fixable CO_2 of the country can be estimated by the formula of 1000 x area of the country.

The amount of NOx produced in the world is 1.68 billion tons. Developed countries are eliminating ca. 0.6 billion tons of NOx producing 1.0 billion tons of CO_2. 0.6 billion tons of NOx can fix 15 (= 0.6x25) billion tons of CO_2. The(ore, if developed countries stop NOx elimination, 16.0 (= 15.0+1) billion tons of CO_2 emission is reduced and global warming can be protected.

Since the areas of the countries with high GWPR such as Japan, Germany, Iran, U.K, and Italy having their GWPR data of 3.4, 2.2, 3.9, 1.7, and 1.2, respectively, are narrow, they cannot fix completely CO_2 produced in their countries.

The Growth rates of GDP of the countries who eliminate NOx are small as shown in the cases of USA, Germany, Japan, Canada, U.K, and Italy having the GDP data of 0.88, 1.46, 1.83, 1.03, 1.44, 1.6, and 0.88, respectively.

China, USA, India, and Japan produced 0.425, 0.2, 0.1, and 0.05, respectively, billion tons of NOx. Japan is eliminating the same amount as 0.05 billion tons of NOx thus produced, using 0.0128 billion tons of butane, which is used for the production of 0.00606 billion tons of H_2 and 0.748 billion tons of CO_2. If Japan stops NOx elimination, 1.25 (= 0.05x25) billion tons of CO_2, which is 25 times more than the amount of NOx produced, can be fixed. By doing plankton CO_2 assimilation at 3 times area of Japanese Islands with $3.8x\ 10^5$ Km^2 area, 1.14 billion tons of CO_2 can be fixed. 0.0745 billion tons of CO_2 produced for stopping of NOx elimination can be saved. Furthermore, 0.5 billion tons of CO_2 by stopping NP waste water purification can be saved. As the total amount, 1.2645 (= 1.14+0.0745+0.05) billion tons of CO_2 can be stopped. Japan can produce 0.03 billion tons of fish and Japanese can enjoy anti-aging and long life. (26 and 51-58) If Europe stops the elimination of 0.071 billion ton s of NOx and 0.02 billion tons of NP, generation of 1 billion tons of CO_2 can be stopped. In addition, 0.01 billion tons of fish can be produced.

China is producing 10.64 billion tons of CO_2 and the area of China is $1.0x10^7$ km^2. China can fix 10 billion tons of CO_2. The(ore, GWPR can be calculated to be 1.0 (= 10.65/10). On the other hand, GWRP of Japan with a smaller territory is 3.4 (= 1.25/0.37)

NOx elimination can be found by NOx concentration of exit gas. The level of 1.6 g/kwh is recognized as “no NOx elimination”, while that of less than 0.1 g/kWh is recognized as “complete NOx elimination”. The “no NOx elimination” countries like China, and India, Indonesia show low GWPR and high GDP growth rate. On the contrary, the NOx eliminating countries show high GRPR and low GDP growth rate, as shown in the case of Japan, Germany, UK, and Italy which have the GRPR & low GDP growth rate data of 3.4 & 1.03, 2.2 & 1.83, 1.7 & 1.8), and 1.2 & 0.88, respectively.

Japan is eliminating NOx, NP most severely. The NOx concentration at exit gas is 0.1 g/kWh. Then fish production decreased from 12 million tons in 1970 to 2 million tons in 1985 because of the NOx NP elimination policy. DGP has not increased for 40 years from 1980.

Low doses of inhalation of nitric oxide have been reported to be clinically effective, and the concentration of most of doses currently recommended does not exceed 40 ppm. At this level of dose, a little measurable short term toxicity was reported. Indeed, it is noteworthy that in the large randomized trials of inhalation of nitric oxide, major clinical toxicity (e.g. methemolobinemia) was observed only at dose of more than 80 ppm. The(ore, NOx has a small demerit but a more significant big merit that NOx is essential for the growth of plant for the production of food for the promotion of health and long life. The ratio of merit/demerit is 10000/1. The(ore, the NOx elimination at exit gas of factory and garbage incinerator should be stopped.

11. Relation of London dumping convention and global warming (39)

Ocean dumping of excreta is essential to promote CO_2 assimilation. Excreta was dumped to ocean, wood, field, and agriculture field before 1972. After London dump convention was established in 1972, London dump convention was set up for the prevention of marine pollution by dumping of wastes and other matters. Ocean dumping of pollution matters was inhibited. Excreta contain urea and ammonia. Urea is the best nitrogen fertilizer. However, waste water was assigned as pollution material. Many developed countries stopped dumping of excreta. They started purification of waste water by activated sludge process. A typical example is the Seto inland sea in Japan. The Seto inland sea changed

dramatically since 1980. Concentration of NP of the sea water become very low. Plankton does not grow. Nori (Sea weed) and Kaki do not grow. Moreover, the catch of fish decreased. The CO_2 assimilation decreased in the Seto inland sea, which became dead sea (19). The CO_2 fixation decreased and global warming is progressing. If we dump excreta to the ocean, the plankton growth is accelerated and the CO_2 fixation is accelerated and 51 billion tons of CO_2 will be fixed. Finally, we could pass the criteria of Paris agreement and global warming would stop.

11.1. Ocean dumping of radioactive substance

The London protocol inhibits the dumping of wastes with more than de minims levels of radioactivity. Japan was hit by a big earthquake 2011 and some atomic energy facilities released radioactive waste water. In the incident, a large amount of radioactive substances are produced by decommissioning of nuclear reactor. Dumping of radioactive waste is not possible by London dumping convention. The(ore, Japan is producing a large amount of CO_2 (presume 0.3 billion tons) for its treatment and storage to avoid troubles with other countries and yet Japan cannot eliminate such radioactive materials. Japan cannot export agriculture products to other countries, because Japan is keeping radioactive compounds in Japan. Electricity generation by atomic energy in Japan is almost stopping. Japan has no way to eliminate radioactive substances. The only way is dumping of radioactive waste to sea. Sea is wide and deep and infinite dilution is possible. Japan must find methods to dump radioactive substances giving no harm to other countries. The(ore we must find the method for dumping radioactive substances by safe methods. If we can dump radioactive substances without harm, this would be better than keeping radioactive substances that produces much CO_2 and activates global warming following London dumping convention.

By dumping of waste water, we can save the emission of 10 billion tons of CO_2. We can obtain 1 billion tons of grain and fish. By dumping of radioactive substances, we can save 2 billion tons of CO_2 in emission. Dumping of these substances is better than keeping them in Japan that produces much CO_2 and promotes global warming.

12. Global warming will stop, if developed countries stop NOx and NP elimination (40)

12.1. NOx should be released as it is

NOx is playing a very important role in CO_2 assimilation, growth of plant and plankton, climate control. (2, 4, 5, and 7) But developed countries are eliminating NOx by the reaction with ammonia.

$$4\ NO + 4NH_3 + O_2 \longrightarrow 4N_2 + 6\ H_2O \quad (1)$$

The reaction (1) is elimination of one fertilizer by another fertilizer. This is a tremendous waste of precious resources. The mount of NOx is about 5 times more than that of synthetic nitrogen fertilizer NH_3. This reaction is causing global warming. This reaction should not be done.

Since this reaction was carried out, the Seto inland sea (district without thunder) in Japan changed dramatically. The transparency of the sea increased but the turbidity due to plankton disappeared. Eelglass disappeared and production of fish, sell, and sea weed decreased (1, 2). On the other hand, fish production of the world increased at developing countries who do not do NOx elimination like China, India, and Indonesia. Fish production of developed countries decreased since NOx NP elimination.

12.2. Waste water should be dumped as it is

Developed countries are eliminating NP in waste water. In Japan, 2200 waste water clean centers were build and thereby 11.78 billion kWh electricity (1.16 % of total electricity 1008 billion kWh) were used for the operation of these centers. For the production of 11.78 billion kWh electricity, 600 thousand tons of fuel was burned (37). If we stop waste water purification, 1600 (= 600x3) thousand tons of CO_2 is saved in its emission. By the operation of these centers, emission of 44.8 thousand tons of N and 17.5 thousand tons of P is lost. Because of the elimination of NOx and NP, fish production of Japan decreased from 12 million tons in 1975 to 2.5 million tons after 1980. Because of decrease of NP concentration of sea water, plankton cannot grow and fish, cell, and sea weed cannot grow. Fish eats 20 times plankton in weight. Plankton grows eating the same weight as that of CO_2.

If Japan stops NOx, NP elimination, the NP concentration the sea water increases and 0.24 billion tons of plankton grow and 0.24 billion tons of CO_2 is fixed so that 12 million tons of fish will be produced (13, 14, 21, and 31-39).

12.3. Bon fire is recommend

Slash and burn agriculture is carried out for thousands of years in the world. Wood is burned and turns to the field which can produce crops. Ash produced by burning is said to be an effective substance. But the main effective substance is NOx (35). When 1000 tons of tree is burned, 40 (= 1000/25) tons of NOx is produced, since 40 tons of NOx can make 1000 (= 40x25) tons of plant grow (35). In Japan, 3 billion tons of garbage is collected and burned at high temperature incinerator to produce 0.012 billion tons of NOx. This NOx is eliminated by treatment with ammonia.

In Japan, a very special law about the garbage incinerator was set up in 2002 by the reason that much NOx is produced at lower temperature. According to this rule, the incinerator must be burned at higher temperature than 800 °C by adding excess fuel to keep higher temperature. Corrugated carton and fallen leaves must be burned at high temperature in the incinerator. Bon fire is inhibited by the reason that bon fire produces much NOx. Burning of rice straw and wheat straw is not possible. Big earth quake and tsunami happened in the east of Japan in 2011. Debris disposal was not allowed to burn on the site. The debris disposal must be transferred to distant districts having high temperature-controlled incinerators which consumed much fuel and money. Operation of these high temperature incinerators requires a great excess of fuel releasing much CO_2. Garbage, waste wood, fallen leaves, and straw should be burned on sites producing much fertilizer NOx. Bon fir inhibition rule should be abandoned.

12.4. Method to fit Paris agreement

51 billion tons of CO_2 are now producing in the world. To fix so much CO_2, the promotion of plant growth and the increase of CO_2 fixation are essential. Plant has 25/1 composition of C/N in average. As one N combines with 25 Cs derived from CO_2, the supply of N corresponding to 2.05 (= 51/25) billion tons of NOx is necessary for the plant growth to consume 51 billion tons of CO_2 thus produced. To supply N, the use of NOx is reasonable and this material should be released to air as it is. 1.68 billion tons of NOx is produced. In waste water, 1 billion tons of NP are estimated to be contained. From these substances of NOx and NP, 7 developed countries are eliminating 0.6 billion tons of NOx and 0.4 billion tons of NP.

To stop the increase of CO_2 and accelerate the CO_2 assimilation, 7 developed countries should stop not only the elimination of NOx and NP but bon fire. As the result, 25 [= (0.6+0. 4) x25] billion tons of CO_2 can be fixed. If this proposal can be realized, the levels of emission and fixation of CO_2 become equal with each other and GWPR (Global Warming Protection Ratio) becomes one and fits Paris Agreement (5, 7, 10, 16, 19, 22, 24, 29, and 31- 50).

12.5. Comparison of NOx, NP elimination countries and no NOx, NP elimination countries

Developing countries like China and India do not eliminate NOx and NP and release them as they are. Electricity price is low and CO_2 assimilation is activated. The amount of products in agriculture and fish industries increases. GDP is increasing to the degree of 6% for 40 consecutive years. China uses 10.6 billion tons of CO_2 and 0.4 billion tons of NOx effectively and increased fish production to 81.53 million tons.

Table 7 The data of CO_2em, CO_2fix, CO_2em/p, NOxcon, W dump, GWPR, and GDP of 11 countries

Country	CO_2 em hmt	CO_2f hmt	CO_2em/p Ton	NOxcon g/kWh	W Dump	elect price c/kWh	GWPR	GDP inc ratio
Word	510	370					1.38	
China	106	100	8.0	1.6	Do	1.6-45	1	6.9
India	24.6	32	1.9	1.6	Do	8	0.76	7.1
Indonesia	5.0	19	2.1	1.6	Do	7	0.3	5.2
USA	51.0	95	19.1	0.5	No	12	0.53	1.48
Japan (2018)	12.5	3.8	8,9	0.1	No	24	3.3	1.03
Japan (1980)	5.5	5.5	3.1	1.6	Do		1	7.0
Russia	19.6	32		0.61		5.8	0.61	0.8
Germany	7.8	3.5	8.9	0.31	No	32	2.2	1.83
U.K.	4.0	2.4	5.6	1.3	No	15.4	1.7	1.8
Italy	3.5	3.0	5.8	0.5	No	28	1.2	0.88
France	3.3	8.4	5.0	17	No	19	0.4	1.2
Canada	5.6	100	18	1.3	No	8.1	0.06	1.44

India uses 0.1 billion tons of NOx effectively and the grain production increases 5 times more in 2010 than in 1950. Population increased 0.38 to 1.25 billion from 1951 to 2014. On the contrary, 7 developed countries are eliminating NOx and NP. CO_2 assimilation is depressed. Production of grain and fish is depressed. The GDP growth rate is low. The figure of GWPR is high. Japan is doing the elimination of NOx and NP most severely. The production of 8 million tons of is lost yearly. Fish price is 10 $/Kg. Japan is losing 0.08 billion $. The GDP growth rate increased only 1.6 % from 1985 to 2017. Japan dropped the food production ability in his country to 37% in 2018 from 100% in 1948. The countries who use NOx and NP are growing and increasing population. In contrast, the countries who eliminate NOx and NP are declining and decreasing population.

The data of CO_2em (CO_2 emission), CO_2f (fixable CO_2), CO_2em/p (CO_2 emission per person), NOxcon (NOx concentration at exit gas), W dump (Wastewater dumping), GWPR (global warming protection ratio), and GDP (GDP increase ratio) of 11 countries are shown in Table 7.

In Table 7, the data of CO_2em (internet), CO_2em/p (internet), and GDP (internet) were obtained from the internet sources. The data of CO_2f and NOxcon were cited from (21 and (19, respectively. GWPR = CO_2em/CO_2f.

Japan had not been eliminating NOx before1980. In 1980, the amount of CO_2 emitted was 0.55 billion tons and the amount of CO_2 fixed was 0.55 billion tons. The NOxcon in exit gas was 1.6 g/kWh, The GWPR was 1 and the increase rate of GDP was 7.0. In 2018, the amount of CO_2 emitted is 1.25 billion tons and the amount of CO_2 fixed is 0.38 billion tons. The NOx con is 0.1 g/Wh and NOx is not treated for water dumping. The data of GWPR and GDP are 3.3 and 1.03, respectively.

Japan, Germany, UK, and Italy has narrow lands so that they cannot fix CO_2 produced at their countries. Their GWPR data exceed 1.0. These countries are surrounded by sea. They can fix CO_2 by plankton CO_2 assimilation by increase of NP concentration of sea. The(ore, The elimination of NOx and NP should be stopped.

12.6. Japan should stop elimination of NOx and NP and should not inhibit bon fire

Japan is criticized as the country which is producing much CO_2. Japan is producing much CO_2 for electricity generation and eliminating NOx and NP. Japan established a very severe law. Every factory must eliminate NOx by means of treatment with NH_3 to the level of less than 0.1 g/kWh.

Japan also eliminates NP in waste water purification centers completely using much electricity. Japan is producing 1.25 billion tons of CO_2 but is criticized as the country which produces CO_2 increasingly. Wood and agriculture fields can fix 1000 tons of CO_2 per 1 Km^2. Japan land is $3.8x10^5$ km^2. Fixable CO_2 in Japan is 0.38 (= $3.5x10^5x1000$) billion tons. Japan is increasing 0.87 (= 1.25-0.38) billion tons of CO_2.

GWPR of Japan is 3.3 (= 12.5/3.8). Japan is using 28 million tons o NH_3 for the elimination of NOx. 11 million tons of butane is used for the preparation of NH_3 but this process caused unfortunately the generation of 33 million tons of CO_2. Japan is also using 11.8 billion kWh of electricity for water purification (35). If Japan stops the elimination of NOx and NP, the CO_2 emission will be reduced to 1.06 (= 1.25-0.1-0.1) billion tons. By using 0.05 billion tons of NOx, 1.25 (= 0.05x25) billion tons of CO_2 can be fixed. Food production will increase. The GWPR will decrease to 0.84 (=1.05/1.25) from 3.3 (= 1.25/0.38) in 2018. This value fits Paris agreement.

12.7. Waste water dumping should not be prohibited

Waste water contains much NP fertilizer. About 1 billion tons of NP in waste water. Developed countries define excreta as pollution substance, stopped ocean dumping following London dumping convention, and eliminated NP using the activated sludge process. Developing countries are releasing waste water as it is. However, dumping of waste water gives good effects on CO_2 assimilation. To dump waste water or not gives the effect on CO_2 assimilation a big difference. China, India, and Indonesia are dumping waste water without the elimination of NOx. The GWPR data of these countries are less than 1, and China, India, and Indonesia showed the GDP increase rates of 6.9, 7.1, and 5.2, respectively, which are more than 5. On the contrary, developed countries who do not dump waste water and do not eliminate NP show high GWPR, as shown in the following data [country (GWPR)]: Japan (3.3), Germany (2.2), U.K (1.7), and Italy (1.2). The GDP of these countries is less than 1, as shown in the following data [country (GDP)]: Japan (1.03), Germany (1.83), U.K (1.8), Italy (0.88), and France (1.2). Japan had not eliminated NOx before 1980. In 1980, the amounts of CO_2em and CO_2f were 5.5 billion tons and 5.5 billion tons, respectively. The concentration of NOx in exit gas was 1.6 g/Wh. The GWPR and the GDP increase rates were 1 and 7.0, respectively. Compared with these data, in 2018, the data of CO_2em, CO_2f, and NOxcon are 12.5 billion tons, 3.9 billion tons, and 0.1 g/Wh. The data of GWPR and GDP are 3.4 and 1.03.

Japan, Germany, UK, and Italy are narrow and they cannot fix CO_2 produced in their countries. GWPR is over 1. These countries are surrounded by sea. They can fix CO_2 using plankton CO_2 assimilation by increase of NP concentration of sea. The NP elimination should be stopped without NOx elimination and with waste water dumping of NOx. Then the GWPR will become 1 and the DGP growth rate will increase.

13. Promotion of CO_2 assimilation by stopping of NOx, NP elimination is easy method to protect global warming (46)

Global warming is caused by lack of nitrogen due to elimination of NOx and NP in developed countries. If developed countries stop elimination of NOx and NP, global warming will not happen. Much food will be produced and GDP will increase.

13.1. We must protect burn out of fossil

Since industrial revolution, mankind has been using a large amount of fossil fuel for manufacturing of food, iron, aluminum, plastic, and fertilizer. Global warming comes from over burning of fossil. Fossil fuel is a fossil of plants made by CO_2 assimilation from CO_2 and water in 5 billion years. Mankind has been using this fossil fuel in 500 years. Yearly use of fossil fuel is estimated to be reduced 25% by COVID-19. Thus, the term of years when oil, natural gas, and coal can be used is extended from 42 to 56 years, from 60 to 81 years, from 121 to 162 years, respectively.

Table 8 Estimated amount of buried fossil

Fossil	buried amount billion ton	yearly use billion ton	Number of Years capable of use of fossil billion ton
Natural gas	276.9	4.6 → 3.4	60 → 81
Oil	173	4.1 → 3.1	42 → 56
Coal	909	7.5 → 5.6	121 → 162
Uranium			124

Until now, our human being has used 1360 billion tons of fossil which is corresponding to around a half of the total reserves of fossil buried in the earth. The remaining fossil is estimated as 1360 billion tons.

When fossil is burned out, we need not worry about global warming. We must worry how we can live civilized life. How can we drive car, airplane, and agriculture machine? How can we generate electricity? We must save the consumption of fossil. We should not spend precious fossil for the elimination of NOx and NP. We must protect burn out of fossil fuel as long as possible.

13.2. Prediction of fossil fuel and life at 2220 (200 years after now)

Human being is using now much fossil as exemplified in the use of 3.4 billion tons of natural gas, 3.1 billion tons of oil, and 5.6 billion tons of coal. About the same amount of remaining fossil as that used so far could be used in the future. However, the remaining fossil is limited. The amount of fossil used every year will become smaller than now. In 2200, a 1/4 amount of remaining fossil will be still available. We must limit the use of fossil to get food like agriculture machine and fishing boat. The number of sailing boats will increase. The number of cars and airplanes will become much fewer. Leisure trip must be limited. The use of fossil for air conditioning must be limited. We must depend on woods. There is 80 billon tons of wood in the world and increasing 1-2% annually. Tree grows quickly if sufficient N and P are provided. We must provide enough NP for the promotion of plant growth

14. Summary

Promotion of CO_2 assimilation according to the following 8 items is necessary for protection of global warming.

- Elimination process of NOx by use of ammonia at power stations, chemical station, and iron work stations should be stopped.
- Elimination process of nutritious N and P in drainage should be stopped. Ocean dumping, field dumping, and forest dumping of excreta are recommended.

- Stop the unproductive uses of fossil fuel like war, auto race, leisure cruising, and leisure trip.
- Stop the unnecessary economic stimulus measures such as renewal of building and car and construction of unnecessary building, road, and railway.
- Restriction rule of NOx emission of car should be loosed putting emphasis on fuel efficiency.
- Stop the construction of solar cell system due to the sacrifice of wood.
- Bon fire should be encouraged. Bon fire ban rule should be abandoned.
- Encourage the use of phosphorous detergent like sodium tripolyphosphate.

15. Conclusion

Global warming is caused by scare of nitrogen and phosphorous by the elimination of NOx and NP. If developed countries stop NOx,NP elimination, CO2 assimilation is activated and CO2 fix and food production will increase, and global warming will stop and national wealth and DGP will increase.

Compliance with ethical standards

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No conflict of interest.

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