

## Promotion of CO<sub>2</sub> Assimilation by Effective Use of NO<sub>x</sub> and NP is Best Method to Produce Much Fish and Protect Global Warming

Shoichiro Ozaki\*

*The Institute of Physical and Chemical Research, Wakoshi, Saitama Japan*

\***Corresponding Author:** Shoichiro Ozaki, The Institute of Physical and Chemical Research, Wakoshi, Saitama Japan.

**Received:** June 20, 2019; **Published:** July 22, 2019

### Abstract

Since the industrial revolution, burning of fossil and production of CO<sub>2</sub> and NO<sub>x</sub> increased greatly. Increased CO<sub>2</sub> and NO<sub>x</sub> promoted the CO<sub>2</sub> assimilation. Production of grain and fish increased. About 360 billion tone CO<sub>2</sub> is produced by burning of much fossil. About 14.4 billion tone NO<sub>x</sub> is produced in 2015. Most of emitted CO<sub>2</sub> is fixed by CO<sub>2</sub> assimilation. But since developed country started NO<sub>x</sub> elimination and NP elimination at around 1975, half of produced NO<sub>x</sub> is eliminated. 3 billion tone NP in waste water is eliminated by activated sludge process. Nitrogen and phosphorous concentration of sea decreased. CO<sub>2</sub> assimilation and plankton growth are reduced remarkably. Therefore, fish industries of Europe and Japan decreased and GDP growth stopped for 30 years. I estimated how much damages are given to Europe and Japan by NO<sub>x</sub> and NP. We must promote CO<sub>2</sub> assimilation and promote industry by complete use of emitting NO<sub>x</sub> in exhaust gas and NP in waste water.

**Keywords:** *NO<sub>x</sub> Elimination; NP Elimination; CO<sub>2</sub> Assimilation; Global Warming; Fish Production*

### Introduction

Fossil fuel burn releasing CO<sub>2</sub> and heat. CO<sub>2</sub> assimilation reaction is the reaction of CO<sub>2</sub> with water producing carbohydrate and O<sub>2</sub> absorbing heat. Burning reaction is reverse reaction of CO<sub>2</sub> assimilation. If we can compensate the generation of CO<sub>2</sub> and heat of burning with the absorption of CO<sub>2</sub> and heat by CO<sub>2</sub> assimilation, global warming will be protected [1-29].

70 % of CO<sub>2</sub> assimilation is said to be carried out at sea.

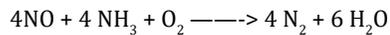
The growth of plankton is dependent on light and nutrient availability. Supply of nutrients are important on future plankton productivity [30].

When we look at how nutrient nitrogen are supplied. NO<sub>x</sub> is main source of nutrient nitrogen. When something is burned, CO<sub>2</sub> is produced and NO<sub>x</sub> 1/25<sup>th</sup> of CO<sub>2</sub> is also produced. About 360 billion tone CO<sub>2</sub> is produced by burning of much fossil. About 14.4 billion tone NO<sub>x</sub> is produced in 2015. Most of emitted CO<sub>2</sub> is fixed by CO<sub>2</sub> assimilation. But since developed country started NO<sub>x</sub> elimination at around 1975, half of produced NO<sub>x</sub> is eliminated. When we look at how nutrient phosphorous are supplied. Excreta is main source of nutrient phosphorous. Excreta of developed country are eliminated. Then CO<sub>2</sub> assimilation and plankton growth are reduced remarkably at developed country. In this paper I wish to show 1. Why global warming is progressing. 2. Why fish production of Europa and Japan decreased. 3. How much loss and damage are produced by doing NO<sub>x</sub> elimination and NP elimination. I wish to show the situation of Japan who doing NO<sub>x</sub> elimination, and NP purification of waste water completely.

### Why global warming is progressing

Since the industrial revolution, burning of fossil and production of CO<sub>2</sub> and heat increased greatly. Increased CO<sub>2</sub> and NO<sub>x</sub> promoted the CO<sub>2</sub> assimilation. Production of grain and fish increased. About 360 billion tone CO<sub>2</sub> is produced by burning of much fossil. About 14.4 billion tone NO<sub>x</sub> is produced in 2015. Most of emitted CO<sub>2</sub> is fixed by CO<sub>2</sub> assimilation. But since developed country started NO<sub>x</sub> elimination and NP elimination at around 1975, half of produced NO<sub>x</sub> is eliminated. NO<sub>x</sub> is main nitrogen fertilizer. NP in waste water is main phosphorous fertilizer. Therefore, CO<sub>2</sub> assimilation is retarded. And emitted 360 billion tone CO<sub>2</sub> is not fixed completely. Concentration of CO<sub>2</sub> increased about 2 ppm. In 2016, 142 billion tone CO<sub>2</sub> is remaining to give global warming. Before 1970, same amount of emitted CO<sub>2</sub> is fixed by CO<sub>2</sub> assimilation. After 1980, CO<sub>2</sub> concentration increasing. This mean that amount of CO<sub>2</sub> fix become smaller than emission. In 1985 CO<sub>2</sub> emission is 210 billion tone, CO<sub>2</sub> fix is 150 billion tone. In 2000 CO<sub>2</sub> emission is 250 billion tone, CO<sub>2</sub> fix is 150 billion In 2010, CO<sub>2</sub> emission is 300 billion tone, CO<sub>2</sub> fix is 170 billion tone. In 2017 CO<sub>2</sub> emission is 360 billion tone, CO<sub>2</sub> fix is 220 billion tone. NO<sub>x</sub> and NP are very effective activator of CO<sub>2</sub> assimilation, fertilizer.

Many developed countries are eliminating 6 billion tone NO<sub>x</sub>, by the reaction with ammonia



Then CO<sub>2</sub> assimilation is retarded. CO<sub>2</sub> fix, around 6 x 25 = 150 billion tone, is retarded. Heat absorption is retarded. Global warming is progressing.

NP elimination in wastewater should be stopped Japan constructed 2200 wastewater purification stations to eliminate NP in the wastewater generating much CO<sub>2</sub>.

I investigated Yamazaki wastewater purification center at Yamazaki, Kamakura in Japan. This center cover 96881 persons. Water 98287 m<sup>3</sup> containing Nitrogen 40 mg /l, Phosphorous 4.2 mg/l is treated by activated sludge process. Air is bubbled for ten hours to give water containing Nitrogen 7.5 mg Phosphorous 2.7 mg/l. Consuming 8841200 kWh electricity. This data showed that 7.34 Kg Nitrogen, 2.65 Kg.

Phosphorous is eliminated in one day at this center. This data indicates 7.34 x 120000000/96881 x 365 = 140 million tone nitrogen, 12.8 million tone phosphorous are eliminated in Japan in one year. Population of Japan is 1.2 billion. 8841200 x 120000000/96881 = 110 billion kWh electricity is consumed in Japan for the treatment of wastewater. This correspond 100880/110 = 1.11% of total electricity consumption 100880 kWh of Japan.

If waste water purification is not done in Japan, 140 x 25 = 35million tone CO<sub>2</sub> is not produced and 35 million tone plankton can grow and 35 x 1/10 = 3.5 million tone fish will be produced. People need not pay water purification fee 30 \$ (1\$/m<sup>3</sup>) per month.

Relation of CO<sub>2</sub> emission, CO<sub>2</sub> fix, NO<sub>x</sub> emission, Fish production [21-24].

The increase of CO<sub>2</sub> and NO<sub>x</sub> production increased the CO<sub>2</sub> assimilation. The increase of CO<sub>2</sub> assimilation increased the production of grain and fish. The production of grain in 1960 0.85 billion tone in 2010 2.6 billion tone 3 times. The population of the world in 1960 30 billion, in 2017 73 billion.

Plankton is the foundation of the ocean food chain. Plankton is eaten by many fish and fish is eaten by many fish and animals.

Fish production of the world increased. In 1940 20 million tone, in 1960 35 million tone, in 1980 45 million tone, in 1990 80 million tone, in 2000 130 million tone, in 2010 130 million tone, in 2016 200 million tone. China increased fish production. 57 times from 1960 to 2017. In 1960 1.5 million tone, 1970 2 million tone, 1980 3 million tone, 1990 4 million tone, 1997 16.33 million tone 2002 16.33 million tone 2016 78.38 million tone, 2017 85.3 million tone. China produced 106 billion tone CO<sub>2</sub> and 4 billion tone NO<sub>x</sub>. 4 billion tone NO<sub>x</sub> contributed for the increase of nitrogen concentration of sea, and growth of plankton, increase of fish production.

### Method to decrease CO<sub>2</sub> release

Japan increasing 9.2 billion tone CO<sub>2</sub>, Germany increasing 4.3 billion tone CO<sub>2</sub>, UK increasing 1.6 billion tone CO<sub>2</sub>, Turkey increasing 3.2 billion tone CO<sub>2</sub> and Italy increasing 0.3 billion tone CO<sub>2</sub>. Japan producing 1 billion tone CO<sub>2</sub> for the elimination of NO<sub>x</sub> NP. If Japan stop elimination of CO<sub>2</sub>, NP, Japan can reduce 1 billion tone CO<sub>2</sub> release. Japan can increase  $0.5 \times 25 = 12.5$  billion tone CO<sub>2</sub> fix and can produce 12.5 billion tone plankton. Japan can increase  $12.5/20 = 0.6$  billion tone fish. If they stop NO<sub>x</sub>, NP elimination. They can accelerate plankton growth and can fix increasing CO<sub>2</sub>. Japan, Germany, UK and Italy cannot fix produced CO<sub>2</sub> at his countries. Because countries are small. They should consider sea as a farm of plankton, fish and farm to fix CO<sub>2</sub> then they can fix produced CO<sub>2</sub> at his surrounding sea.

Why fish production of Japan decreased [12,13]. Japan was producing 12 million tone fish in 1970. Top in the world. But fish production decreased to less than 3 million tone now. I wish to explain the reason why fish production of Japan decreased when most of other countries increasing fish production.

As mentioned at previous paper [1,2], I was born at Seto inland seaside beach at Kurashiki in 1930. Set inland sea (sea between Shikoku and Chugoku in Japan) This district is no thunder district. Supply of NO<sub>x</sub> by thunder is not possible. Sea was filled with seaweed and fish before 1980. Two news about the red sea (red plankton growth) at near hatchery fish plants at Kagawa prefecture, and much water weed growth at Biwako lake in Japan were reported. These were special event at special district. Aquaculture by imported fish powder is done at Kagawa prefecture. Then red plankton grow Official thought never red plankton growth at sea. Official define nitrogen, phosphorous and CO<sub>2</sub> as three evil for environmental protection. Official established very strict rules that NO<sub>x</sub> in exhaust gas of electricity generation plant, chemical plant, iron making plant should be zero. NP in wastewater should be zero. In 1960, 60 thousand tone triply phosphate is used as detergent additives. The use of this phosphate was inhibited. Many wastewater purification centers were established. The nitrogen and phosphorus in the wastewater were eliminated by activated sludge process. And all N P in the wastewater become zero. Growth of plankton and weed were stopped. Eel glass (amamo) disappeared. Kaki on rock disappeared. Sea gull (Kamome) disappeared. Fish cannot grow at no plankton no weed sea. Japan produced 11.5 million tone fish, top in the world in 1984 But fish production decreased to 3.5 million tone 7<sup>th</sup> place in 2018. This (800 million tone) is huge decrease by decrease of plankton by decrease of nitrogen concentration of sea water. Japan is eliminating 0.5 billion tone NO<sub>x</sub> since 1984. Fish price increased 1960 0.3 USD/kg, 1970 0.5 USD/kg, 1980 1 USD/kg, 1990 2 USD/kg, 2000 3 USD/kg, 2010 4 USD/kg, 2018 8 USD/kg. Price of 800 million tone fish is  $8 \times 8000000000 = 640$  billion USD. Japan losing fish 640 billion USD (540 USD per person) each year. About 2 million fisherman lost job. Japanese eat fish as main protein source. But fish price increased more than 10 times. Then Japanese cannot eat much fish. fish/meat eat ratio decreased from 1945 99/ to 2018 30/70. Fish were cheap than meat before 1970. Japanese can live longest, average men can alive 80.5 years (third), women can alive 86.83 years (top in the world) by eating fish. But now fish is much more expensive than meat since nutrient N and P elimination rule. We Japanese may loose long-life record. Rice production reduced. 1970 12 million tone to 2018 7.82 million tone.

Since Japan started NO<sub>x</sub> elimination and NP elimination in 1980, GDP growth rate [18] increased only 1.6 % from 1985 to 2017. Government debt balance/DGP is 237%, worst in 188 countries NO<sub>x</sub> elimination and NP elimination should not be done to protect decline of food production.

GDP and population can be increased by effective use of NO<sub>x</sub> and NP [15,18].

The increase of CO<sub>2</sub> and NO<sub>x</sub> production increased the CO<sub>2</sub> assimilation [27]. The increase of CO<sub>2</sub> assimilation increased the production of grain and fish. Increase of grain increased population. Population in 1960 30 billion, in 2017 73 billion. The production of grain in 1960 0.85 billion tone in 2010 2.6 billion tone 3 times. NO<sub>x</sub> emission in 1960 4 billion tone, in 2017 14.4 billion tone. The production of grain in India increased 5 times from 1950 to 2010. In 1950 0.5 billion tone, 1960 0.7 billion tone, 1970 1 billion tone, 1980 1.2 billion tone, 1990 1.7 billion tone, 2000 2.2 billion tone, 2010 2.5 billion tone, CO<sub>2</sub> emission is now 24 billion tone. NO<sub>x</sub> emission increased to 1 billion tone. The increase of NO<sub>x</sub> contributed for the production of 2.5 billion tone grain. Population of India increased 1951 3.8 billion to

2014 12.5 billion. 3,3 times grain production increased 5 times. The countries who use NO<sub>x</sub>, NP are growing and increasing population. The countries who eliminate NO<sub>x</sub>, NP are declining and decreasing population.

Grain and fish production of Japan decreased Food production ratio (food produced at his country) from 100% in 1945 to 37 % in 2015. Population of Japan is decreasing about 0.4 million per year. It is estimated that population of Japan in 2118 will be fifty million (about 40% of present population).

Japan producing 12 billion tone carbon dioxide. Area of Japan is  $3.8 \times 10^5$  km<sup>2</sup> Japan can fix 3.3 billion tone CO<sub>2</sub> Japan must fix 7 billion tone carbon dioxide. Japan must reduce 7 billion tone CO<sub>2</sub> emission to reduce 7 million tone carbon dioxide. We must absorb carbon dioxide by CO<sub>2</sub> assimilation at 2.1 times wide area of sea. We must provide nutrient N P to the sea.

Japan producing 12 billion tone CO<sub>2</sub> and 0.5 billion tone NO<sub>x</sub>. Fixing 3.3 billion tone CO<sub>2</sub> at  $3.3 \times 10^5$  km<sup>2</sup> land. Emitting 1 billion tone CO<sub>2</sub> for eliminating of NO<sub>x</sub>. Emitting 1 billion tone CO<sub>2</sub> for Drainage cleaning. If these are stopped,  $0.5 \times 25 = 12.5$  billion tone CO<sub>2</sub> can be fixed.

$1 + 1 + 0.5 \times 25 = 14.5$  billion tone CO<sub>2</sub> emission will stop. Japan CO<sub>2</sub> res is 4.95 billion tone.

If Japan stop NO<sub>x</sub> elimination, wastewater purification, Japan can produce 2 billion tone fish 8 million tone rice and DGP growth rate increase 8 %, increase population and can protect global warming [28,29].

### Summary

NO<sub>x</sub> elimination and NP elimination are reducing CO<sub>2</sub> assimilation, grain production, fish production, DGP growth rate and population. NO<sub>x</sub> produced by burning should be released as it is and NP in waste water should be released as it is.

### Bibliography

1. Ozaki Shoichiro. "Recycle of nitrogen and phosphorous for the increase of food production". *New Food Industry* 35.10 (1993): 33-39.
2. Ozaki Shoichiro. "Methods to protect global warming". *Advanced Techniques in Biology and Medicine* 4 (2016): 181.
3. Ozaki Shoichiro. "Methods to protect global warming, Food production increase way". *New Food Industry* 58.8 (2016): 47-52.
4. Ozaki Shoichiro. "Global warming can be protected by promotion of CO<sub>2</sub> assimilation using NO<sub>x</sub>". *Journal of Climatology and Weather Forecasting* 4.2 (2016): 1000171.
5. Ozaki Shoichiro. "Global warming can be protected by promotion of plankton CO<sub>2</sub> assimilation". *Journal of Marine Science: Research and Development* 6 (2016): 213.
6. Ozaki Shoichiro. "Method to protect global warming by promotion of CO<sub>2</sub> assimilation and method to reactivate fish industry". *New Food Industry* 59.3 (2017): 61-70
7. Ozaki Shoichiro. "NO<sub>x</sub> is Best Compound to Reduce CO<sub>2</sub>". *European Journal of Experimental Biology* 7 (2017): 12.
8. Ozaki Shoichiro. "Protection of global warming and burn out of fossil fuel by promotion of CO<sub>2</sub> assimilation". *Journal of Marine Biology and Oceanography* 6 (2017): 2.
9. Ozaki Shoichiro. "Promotion of CO<sub>2</sub> assimilation supposed by NO<sub>x</sub> is best way to protect global warming and food production". *Archives of Petroleum and Environmental Biotechnology* 2 (2017): 110.

10. Ozaki Shoichiro. "Promotion of CO<sub>2</sub> assimilation supported by NO<sub>x</sub> is best way to protect global warming". *Journal of Marine Biology and Aquaculture* 3.2 (2017).
11. Ozaki Shoichiro. "Stopping of NO<sub>x</sub> elimination is easy way to reduce CO<sub>2</sub> and protect global warming". *Journal of Environmental Science and Public Health* 1.1 (2017): 24-34.
12. Ozaki Shoichiro. "Effective uses of NO<sub>x</sub> and drainage are clever way to protect global warming and to increase fish production". *Oceanography and Fisheries* 4.4 (2017).
13. Ozaki Shoichiro. "NO<sub>x</sub> Elimination and Drainage NP Elimination should be stopped for the production of fish and for the protection of global warming". *Journal of Fisheries and Aquaculture Development* (2017): 125.
14. Ozaki Shoichiro. "Let`s enjoy civilized life using limited amount of fossil fuel". *Journal of Aquaculture and Marine Biology* 6.3 (2017): 00158.
15. Ozaki Shoichiro. "Method to fit Paris agreement for protection of global warming". *International Journal of Waste Resources* 7.4 (2017): 318.
16. Ozaki Shoichiro. "Method to protect global warming and to produce much fish by promotion of plankton growth". *New Food Industry* 60.3 (2018): 88-94.
17. Ozaki Shoichiro. "Method to protect global warming by promotion of plankton CO<sub>2</sub> assimilation". *Rikuryou Science* 61 (2018): 23.
18. Ozaki Shoichiro. "Effect of NO<sub>x</sub> elimination on electricity price, fish production, GDP and protection of global warming". *International Journal of Waste Resources* 8.1 (2018): 1000328.
19. Ozaki Shoichiro. "How to fix carbon dioxide same amount as emission for the protection of global warming". *Research and Development in Material Science* 3.5 (2018).
20. Ozaki Shoichiro. "Stop of NO<sub>x</sub> elimination and stop of waste water purification are easy methods to protect global warming". *Journal of Immunology and Inflammation Diseases Therapy* 1.1 (2018): 10006.
21. Ozaki Shoichiro. "Climate can be regulated by effective use of NO<sub>x</sub> and waste water NP". *Biomedical Research and Reviews* 1.1 (2018).
22. Ozaki Shoichiro. "Promotion of Plankton CO<sub>2</sub> assimilation by effective use of NO<sub>x</sub> and NP is best method to produce much fish and protect global warming". *Journal of Marine Science Research and Oceanography* 1.1 (2018): 1.
23. Ozaki Shoichiro. "Promotion of plankton CO<sub>2</sub> assimilation by NO<sub>x</sub> is best way to protect global warming and to get best climate". *International Journal of Earth and Environmental Sciences* 3 (2018): 160.
24. Ozaki Shoichiro. "Promotion of plant growth by NO<sub>x</sub> is best method to reduce CO<sub>2</sub> and to protect global warming". *Current Trends in Oceanography and Marine Science* 1 (2018): 1-4.
25. Ozaki Shoichiro. "Fish is best food to get anti-aging and long life. NO<sub>x</sub> elimination should be stopped to produce much fish and to protect global warming". *Jacobs Journal of Physiology* 4.1 (2018): 17.
26. Ozaki Shoichiro. "NO<sub>x</sub> and NP in wastewater fix CO<sub>2</sub> and control global warming and climate". *International Journal of Biochemistry and Physiology* 3.4 (2018): 16000140.
27. Ozaki Shoichiro. "The effect of increase of NO<sub>x</sub> and CO<sub>2</sub> on grain and fish production, protection of global warming and climate". *International Journal of Earth Science and Geology* 1.1 (2019): 6-10.

28. Ozaki Shoichiro. "Complete use of NO<sub>x</sub> and NP is essential for the increased production of food and protection of global warming". *International Journal of Innovative Studies in Aquatic Biology and Fisheries* 5.1 (2019): 1-6.
29. Ozaki Shoichiro. "Increase of CO<sub>2</sub> and NO<sub>x</sub> promote CO<sub>2</sub> assimilation, CO<sub>2</sub> fix and food production". *Advances in Bioengineering and Biomedical Science Research* 2.3 (2019): 1-6.
30. Falkowski PG and Wilson C. "Phytoplankton productivity in the North Pacific ocean since 1900 and implications for absorption of anthropogenic CO<sub>2</sub>". *Nature* 358 (1992): 741-743.

**Volume 5 Issue 8 August 2019**

**©All rights reserved by Shoichiro Ozaki.**