



Complete use of NO_x and NP is Essential for the Increased Production of Food and Protection of Global Warming

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Abstract: In order to study the reason why global warming is happening. Why 142 billion tone CO₂ is remaining to give global warming. Why fish production of Japan decreased. I investigated CO₂ emission, NO_x emission, grain production, fish production, CO₂ fix and CO₂ increase of many countries. About 380 billion tone CO₂ is fixed by CO₂ assimilation. 142 billion tone CO₂ is remaining to give global warming. Then I found that many developed countries are eliminating NO_x. About half of produced NO_x 7.2 billion tone is eliminated. Then CO₂ assimilation is retarded. CO₂ fix is retarded. And 142 billion tone CO₂ is remaining to give global warming. Japan producing 12.5 billion tone CO₂ and 0.5 Billion tone NO_x. Japan eliminating all of 0.5 billion tone NO_x. Then CO₂ assimilation is retarded. Plankton production is retarded. Fish production of Japan decreased to 10 % since NO_x elimination and NP elimination of waste water. Therefore Japan lost 0.12 billion tone fish production, 2.4 billion tone CO₂ fix by plankton CO₂ assimilation. If developed countries stop elimination of NO_x and NP in waste water, then 142 billion tone CO₂ can be fixed. And CO₂ emission produced by elimination of NO_x, NP is saved. By promotion of plankton CO₂ assimilation by increasing NP concentration at sea, fish production increase and global warming can be protected. Complete use of NO_x and NP are essential for the increased production of food and protection of global warming

Keywords: NO_x, CO₂ assimilation, global warming, food production, NP elimination

1. INTRODUCTION

In 2017 140 billion tone fossil fuel is burned and 360 billion tone CO₂ is produced. Human being and other animal are breathing, generating about 175 billion tone CO₂. Total 535 billion tone CO₂ is produced. Most part of produced CO₂ is converted to carbohydrate and oxygen by CO₂ assimilation.

The earth is warmed by the fossil fuel burning releasing CO₂ and heat. The plant is growing by CO₂ assimilation absorbing CO₂ producing carbohydrate and O₂. If we can compensate the generation of CO₂ and heat with the absorption of CO₂ and heat by CO₂ assimilation, global warming can be protected (Ref 1-27)

About 510 billion tone CO₂ is produced by burning of much fossil and respiration of animals.

About 380 billion tone is fixed by CO₂ assimilation. Most of CO₂ can be fixed by CO₂ assimilation. But, since 1970, CO₂ is increasing 2ppm yearly and 142 billion tone CO₂ is remaining to give global warming. Amount of produced CO₂ is over the amount of fixed CO₂. The time is same as starting of NO_x elimination.

The restriction of exhaust gas of car become very severe. This strict rule is extended to electricity generation plant, iron manufacturing plant and petrochemical plants. The release of NO_x is prohibited at developed countries. As the result CO₂ assimilation is retarded. CO₂ fix is retarded. And CO₂ increased. Global warming is accelerated.

When we look NO_x at internet, innumerable papers of toxicity are written. No paper of NO_x as fertilizer is written. NO_x is produced as fertilizer 130 years ago. Therefore NO_x is hated. But when we investigate the role of NO_x, NO_x is main nitrogen fertilizer. Production of food and global climate are controlled by NO_x. Amount of NO_x is so large 14.4 billion tone. About triple of synthetic nitro-

gen fertilizer of the world. Amount of CO₂ used for elimination of NO_x is also large. Plant is living by eating CO₂, H₂O and NO_x. The effect of CO₂ and NO_x on plant growth and climate are studied by many investigators (Ref 28-47). They report the importance of CO₂ and NO_x. When NO_x is eliminated, plant cannot live. CO₂ assimilation does not happen.

2. CO₂ EMISSION, CO₂ INCREASE OF MANY COUNTRIES

CO₂ emission, CO₂ increase of many countries were investigated to clear the reason why global warming is happening. why only Japan fish production decreased when other countries increased fish production two times. China increased 57 times (Ref 13). Several countries cannot fix CO₂ produced at his countries. Japan is most CO₂ increasing country. Why Japan is most CO₂ increasing country.

I found that Japan doing NO_x elimination most severely (Ref 18). Japan is doing NP purification most severely. Then CO₂ assimilation is retarded very much. Japan is emitting much CO₂ (1.2 billion tone) for the elimination of NO_x and NP.

Japan decreased fish production 1300 million tone to 230 million tone during 1970 to 2015. This indicate 2 billion tone CO₂ fix decreased during 1970 to 2015.

CO₂ emission, NO_x emission, Fish production Grain, CO₂g (CO₂ used for grain production), CO₂t (CO₂ used for tree production), CO₂ increase of many countries are shown in Table 1. Unit is billion tone (ref 22-24)

Table1.

| Country | CO ₂ em | NO _x emi | Fish prod | CO ₂ f | Grain | CO ₂ g | Area | CO ₂ tr | CO ₂ inc |
|--------------|--------------------|---------------------|-----------|-------------------|-------|-------------------|----------------------|--------------------|---------------------|
| World | 360 | 14.4 | 2 | 32 | 33 | 66 | | 140 | |
| China | 106 | 4.25 | 0.794 | 15.9 | 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 | 0.01 | 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 |
| South 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 |
| Ukraine | 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 |
| Argentina | 1.9 | 0.08 | | | | | 1.2x10 ⁵ | 1.9 | 0 |

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| | | | | | | | | | |
|-------------|-----|------|--|--|--|--|-------------------|-----|---|
| Venezuela | 1.8 | 0.07 | | | | | 1.8×10^5 | 1.8 | 0 |
| Pakistan | 1.7 | 0.07 | | | | | 7.9×10^5 | 1.7 | 0 |
| Netherlands | 1.7 | 0.07 | | | | | 1.7×10^5 | 1.7 | 0 |
| Iraq | 1.7 | 0.07 | | | | | 4×10^5 | 1.7 | 0 |
| Philippine | 1.1 | 0.04 | | | | | 3.0×10^5 | 1.1 | 0 |
| Belgium | 1 | 0.01 | | | | | 30×10^5 | 1 | 0 |

China produced 106 billion tone CO₂ and 4.25 billion tone NO_x. Amount of NO_x is so large. Growth of plankton progressed. Fish eat 20 times weight of plankton and 0.794 billion tone fish is produced. Plankton is made from same amount of CO₂. One NO_x can fix 25 times CO₂. $0.794 \times 25 = 15.9$ billion tone CO₂ is fixed. China produced 5.6 billion tone grain and fixed 11,2 billion tone CO₂. By using 9.98 mkm² land, 100 billion tone CO₂ is fixed. Because 1 Km² green land can fix 1000 tone CO₂.

USA is emitting 51 billion tone, India 24.4 billion tone CO₂. The areas of these countries are wide. They can fix all CO₂ emitted at his country. (Ref 10,12)

Japan is emitting 12.5 billion tone, Germany 7.6 billion tone, UK 4 billion tone, Italy 3.5 billion tone, Areas of these countries are narrow. They cannot fix all CO₂ produced at his country. Area of Japan is 3.8×10^5 Km². Fixable CO₂ is $3.8 \times 10^5 \times 1000 = 3.8 \times 10^8$ 3.8 billion tone.. Japan is increasing $12.5 - 3.8 = 8.7$ billion tone CO₂.

Germany is increasing 3 billion tone CO₂. UK 2 billion tone. Italy 3 billion tone.

Amount of NO_x produced at world 14.4 billion tone. At China 4.25 billion tone. USA 2 billion tone, India 1 billion tone, Japan 0.5 billion tone.. Japan eliminating this 0.5 billion tone. Butane 0.1280 billions is used for the production of H₂ 0.0606 billion tone and CO₂ 0.7480 billion tone is produced. Japan constructed several hundred high temperature garbage incinerators to avoid the formation of NO_x. (ref 15) If Japan stop NO_x elimination, 25 times of NO_x $0.5 \times 25 = 12.5$ billion tone CO₂ can be fixed.. By doing plankton CO₂ assimilation at 3 times area of Japan land, 3.8×10^5 Km² area, 11.4 billion tone CO₂ can be fixed. 0.745 billion tone CO₂ by stopping of NO_x elimination can be saved. 0.5 billion tone CO₂ by stopping NP wast water purification can be saved. Total $11.4 + 0.745 + 0.5 = 12.645$ billion tone CO₂ generation can be stopped. And substantial CO₂ increase became zero. We can fit. Paris agreement. Also Japan can produce 0.3 billion fish and Japanese can enjoy anti-aging and long life. (ref 25)

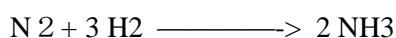
To reduce CO₂ and to protect global warming, NO_x elimination should be stopped. NO_x elimination law should be abandon.

3. NO_x IS A GIFT FROM NATURE (REF 7)

Nature make 1/25 NO_x when one CO₂ is produce. Oxidation of N₂ by O₂ is done at high temperature to produce NO_x(mixture of 90% NO and 10% NO₂). When tree is burned to cook rice, warm the room, bon fire, field burning, burn fossil fuel and thunder (ref 8,9), NO_x is produced. When 25 molecule of CO₂ is produced, one molecule of NO_x is produced. 360 billion tone CO₂ is produced $360 \times 1/25 = 14.4$ billion tone NO_x is produced. 7 Developed country USA, Japan, Germany, UK, France, Italy and Canada are eliminating NO_x by the reaction of NO_x with ammonia. To kill one fertilizer with other fertilizer is action agains nature. We should not do against nature. About half of produced NO_x, 7.2 billion tone NO_x is destroyed by ammoniate to N₂ by following reaction



Ammonia is produced by following reaction



H₂ id produced by following reaction



At 7 developed country, 7.3 billion tone NO_x is eliminated. For these process, 4.08 billion tone ammonia is used. To get 4.08 billion tone NH₃, $4.08 \times 6/28 = 0.874$ billion tone H₂ is used. To get 0.874 billion tone H₂, $0.874 \times 58/26 = 1.88$ billion tone C₄H₁₀ is used. And $0.874 \times 176/26 = 5.91$ billion tone CO₂ is produced.

4. THE EFFECT OF NO_x ELIMINATION ON ELECTRICITY PRICE, FISH PRODUCTION, GDP GROWTH RATE

NO_x is activator of CO₂ assimilation, in other word, fertilizer. Therefore to use NO_x as fertilizer or eliminate NO_x with other fertilizer give great influence on grain production, fish production, electricity price, GDP growth rate.(Ref 18) How NO_x elimination was done is shown by the NO_x con of exit gas at electricity generation plant of each countries. NO_xcon 1.6 g/kWh of China and India means no NO_x elimination. 0.1 g/kWh of Japan means almost complete NO_x elimination.

Table2. CO₂ em , NO_xcon , electricity price, fish, CO₂f plankton, GDP of 8 countries

| Country | CO ₂ em | NO _x con | price | Fish | CO ₂ f plankton | GDP |
|---------|--------------------|---------------------|---------|--------|----------------------------|-------------|
| | bill t | g/ kWh | c/kWh | mill t | bill t | growth rate |
| China | 106.4 | 1.6 | 1.5-4.5 | 81.5 | 19.8 | 6.92 |
| India | 24.5 | 1.6 | | 10.8 | 2.0 | 7.1 |
| Canada | 5.5 | 1.3 | 8.1 | 1.05 | 0.25 | 1.4 |
| UK | 4.0 | 1.3 | 15.4 | 0.91 | 0.002 | 1.8 |
| Germany | 7.7 | 1.0 | 32 | 0.29 | 0.07 | 1.85 |
| USA | 51.7 | 0.5 | 12 | 5.4 | 0.50 | 1.48 |
| Italy | 3.5 | 0.5 | 28 | 0.34 | 0.008 | 0.86 |
| Japan | 12.5 | 0.1 | 24 | 0.23 | 0.46 | 1.01 |

At no NO_x elimination country China NO_xcon = 1.6 g/kWh, electricity price is cheap (1.5-4.5 c/kWh) CO₂ fix by plankton 19.8 billion tone and GDP increase rate is 6.92. India NO_x c= 1.6 g/kWh, GDP 7.1. The countries who do NO_x elimination: USA (NO_xc= 0.5g/hWh, GDP=1.38%) Japan (NO_x=0.1g/kWh, GDP=1.01%), Germany (NO_xc=1.0g/kWh,GDP=1.85%), UK (NO_xc=1.3g/kWh, GDP=1.85%), Italy (NO_xc=9.5g/kWh, GDP=0.88%) show low GDP growth rate. It is clear that NO_x elimination give very bad effect on electricity price, fish production, GDP, economy, increase of CO₂ and global warming.

5. STOP THE DRAINAGE PURIFICATION

Developed countries are purifying drainage by activated sludge process. Bacteria is cultivated by CO₂ and NP and make zero NP in drainage water. This precess need much agitation and consume large amount of electricity. In Japan each house are paying 30 dollar per month for the purification of waste water. Japan constructed 2200 wast water purification stations to eliminate NP in the waste water. Electricity equivalent to 0.5 billion tone CO₂ is used. China, India and Indonesia do not eliminate NO_x, NP and use for the promotion of CO₂ assimilation. Therefore production of grain and fish increased. GDP and population increased. Japan is eliminating NO_x and NP most severely. Therefore CO₂ assimilation is retarded most severely. Growth of plant, plankton are retarded. Production of grain and fish are retarded. Japan is now most poor fish production and most CO₂ increasing country.

6. CONCLUSION

Global warming and increase of CO₂ concentration come from the decrees of CO₂ assimilation by elimination of NO_x at developed countries. Decrease of fish production of Japan comes from the decrease of NP concentration of sea water by NO_x, NP eliminations. Complete use of NO_x and NP are essential for the increased production of food and protection of global warming

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