

## **NOx Elimination and NP Elimination are Promoting Global Warming**

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**Received:** November 14, 2019; **Published:** December 13, 2019

### **Abstract**

Slash and burn agriculture is carried out for many thousand years in the world. Slash and burn agriculture are criticized as destruction of tropical rainy forest producing much CO<sub>2</sub> and toxic gas. Burning of tree produce much CO<sub>2</sub> and 1/25 weight NOx. Produced NOx is a good fertilizer given from nature. NOx promotes CO<sub>2</sub> assimilation and can fix 25 times weight of CO<sub>2</sub>. And can produce same weight of plant. Increase of NOx increased the CO<sub>2</sub> assimilation and food production. Developed countries hated NOx and are eliminating NOx and N, P. Eliminating of NOx and N, P are retarding CO<sub>2</sub> assimilation and increasing CO<sub>2</sub>. Japan is eliminating NOx and NP most severely. Therefore, fish production are retarded and DGP increase rate are retarded. If developed contrives stop elimination of NOx and NP, global warming will be stopped.

**Keywords:** *Slash and Burn Agriculture; NOx; CO<sub>2</sub> Assimilation; Global Warming; NOx elimination; NP elimination*

### **Introduction**

Population of the world is increasing. Increased production of food is necessary. To increase food production, increase of farm land are now progressing in the world. Slash and burn agriculture are now progressing in many countries. Slash and burn agriculture is criticized as destruction of tropical rainy forested producing much CO<sub>2</sub> and producing toxic gas. and accelerating global warming. But I think this is not correct. They do not know burning of tree produce much fertilizer, NOx. People say that forest burning leave ash. This ash work as fertilizer. But real fertilizer is NOx. Weight of ash is so small. When tree is burned, 44/30 weight CO<sub>2</sub> and NOx 1/25 weight of produced CO<sub>2</sub> are produced. This NOx accelerates the growth of plant. One NOx can fix 25 CO<sub>2</sub> and produce same weight of grain. NOx produced is dissolved in rain and works as fertilizer.

Since the industrial revolution, burning of fossil increased. Production of CO<sub>2</sub> and NOx increased. Some developed countries hate NOx and eliminating NOx. At these countries CO<sub>2</sub> assimilation, food production are retarded and DGP do not increase. Some other countries use NOx as fertilizer. And food productions are accelerated and DGP increase. Do NOx elimination or do not do NOx elimination give significant influence on economy, electricity price, import, export. agriculture, fish industry and GDP. NOx elimination should be stopped [1-32].

### **Slash and burn agriculture can increase food production by NOx**

Slash and burn agriculture is carried out for many thousand years in the world.

Wood is burned and wood turn to the field which can produce crops. Ash produced by burning is said to be effective substance. But main effective substance is NOx. When tree 1000 tone is burned,  $1000/25 = 40$  tone NOx is produced. And 40 tone NOx can grow  $40 \times 25$

= 1000 tone plant. By burning of something, by cooking of rice, by burning of tree for warm up the room, by burning of straw, by bonfire, by mountain fire, by bank burning, by fire festival something / 25 = NOx tone is produced [4,7].

Forest fire at Brazil is now big topics. Brazil government are trying to convert tropical rainy forest to agriculture land.  $3.8 \times 10^5$  Km<sup>2</sup> forest is now changing to farm yearly. This kind of action is done at Africa and at Russia at Indonesia and at Malaysia. In this process, forest is burned and agriculture land is made. By changing forest to farm, valuable crops, food is produced. In the process of burning, forest fire can happen. Many people say this process destroying forest and produce much CO<sub>2</sub> and progressing global warming.

But I think to convert forest to farm land must be evaluated by comparing the merit and demerit.

Slash and burn agriculture have big merit. Burn of wood produce much fertilizer. When 1000 kg dry timber is burned,  $1000 \times 44/30 = 1470$  kg CO<sub>2</sub> is produced and  $1470 \times 1/25 = 58.8$  kg NOx is produced. 1470 kg CO<sub>2</sub> and 58.8 kg NOx will produce  $58.8 \text{ kg} \times 25 = 1470$  kg plant by CO<sub>2</sub> assimilation.

Weight of vegetation of world increased about 2 times since the industrial revolution, Green area increased very much since these several 10 years.

Zaichun Zou reported the change of global change of leaf area from 1982 - 2009. Total area of increased green is 18 million km<sup>2</sup>, double of USA area [33]. The effects of CO<sub>2</sub> and NOx on climate and plant growth are studied by many investigators [34-51].

The increase of CO<sub>2</sub> and NOx 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. Slash and burn agriculture might contribute for the increase of food production.

Forest or farm land 1 Km<sup>2</sup> can fix 1000 tone CO<sub>2</sub> in average. This amount is not so different by the plant tree, corn, rice, wheat, potato, wine, coconut, grass for cow if plant is well grown by fertilizer.

When 1000 tone tree is burned,  $1000 \times 264/180 = 1470$  tone CO<sub>2</sub> and  $1470/25 = 59$  tone NOx is produced. 59 tone NOx can produce  $59 \times 25 = 1475$  tone plant. When forest is burned, new plant can grow quickly by absorbing NOx, fertilizer.

We cannot eat tree. We can make plant which produce grain, vegetable or grass which can raise cow.

Population is increasing toward 100 billion in next 20 years. We must increase food production.

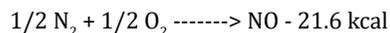
We must increase the land which can produce food. We must change forest to farm land. We must increase fertilizer. NOx is most easily available fertilizer. By burning tree produce CO<sub>2</sub> and NOx.

$3.8 \times 10^5$  Km<sup>2</sup> Forest tree have capacity to fix  $1000 \times 3.8 \times 10^5$  CO<sub>2</sub> tone Forest tree turned =  $3.8 \times 10^8$  tone CO<sub>2</sub> is released. When these tree is burned, and  $3.8 \times 10^8 \times 1/25$  tone NOx is produced. These  $3.8 \times 10^8 \times 1/25$  tone NOx can produce  $3.8 \times 10^8 \times 1/25 \times 25 = 3.8 \times 10^8$  tone plant which produce food.

Therefore, forest burning is production of farm. When forest burning is carried out properly and safe. Forest burning is not bad and should be welcomed and recommended.

### NOx is a fertilizer given from nature

Nature has systems to change N<sub>2</sub> to nutrient nitrogen. By the high temperature at fire place for cooking, warming up of room by burning of wood, by forest fire, by forest burning, by bonfire and also burning of fossil fuel, following reactions proceed.



NOx is a mixture of 90% NO and 10% NO<sub>2</sub>. NOx is dissolved in rain and give nutrient nitric acid and promote the growth of plant and plankton.

When plant is burned then NOx is produced to recover lost plant. When no burning material present, like sea district, thunderstorms make NOx.

NOx is a fertilizer given from nature. We should not against nature. We should use NOx as it is. In 2010 fossil 1.4x 10<sup>10</sup> billion tone was burned and CO<sub>2</sub> 4.4 x 10<sup>10</sup> billion tone and NOx 2.4 x 10<sup>9</sup> billion tone are produced. If we use all NOx for the fixing of CO<sub>2</sub>, we can fix 2.5 x 25 x 10<sup>9</sup> = 5 x 10<sup>10</sup> billion tone CO<sub>2</sub>. As C/N ratio of plant is around 5/1-50/1 (average 25/1).

But NOx of car (11%) is hated as pollution gas causing illness. This hating is extended to electricity plant, iron making plant, petro-chemistry plant. (89%) Many governments of developed counties like USA, Japan, Germany, United Kingdom, France and Italy are eliminating NOx using ammonia. The amount of NOx is so much. 1/25 of produced CO<sub>2</sub>, 20 billion tone (Total synthetic nitrogen fertilizer of the world is around 3 billion tone). Then CO<sub>2</sub> assimilation is retarded. grain and fish production are retarded. The reason why officials of developed countries set up such rule to inhibit the release of NOx lay on internet. Internet tell us hundred thousand papers about toxicity of NOx and no paper indicate NOx is fertilizer (NOx based fertilizer was sold at Norway 150 years ago).

When we look at plankton. Thousand papers including 20 nature papers teach us plankton playing significant role for the control of climate, CO<sub>2</sub> assimilation. Plankton grow infinitely when nitrogen and phosphor are supplied. Plankton reduced 95% CO<sub>2</sub> concentration to 250 ppm in 10 billion years.

I am insisting NOx elimination should be stopped NOx elimination law should be eliminated. NOx should be released to air as it is [11-15,19].

Wastewater purification should be stopped Ocean dumping, field dumping, forest dumping is recommended.

The country who do not do NOx elimination like China (NOx c = 1.6g/ kWh, GDP = 6.92%), India NOxcon = 1.6 g/kWh, GDP = 7.10%,) S Korea (NOx c = 1.6 g/kWh, GDP = 2.8%) can boost high GDP growth rate.

The countries who do this reaction NOx elimination like USA (NOxc = 0.5 g/hWh, GDP = 1.38%), Japan (NOxc = 0.1 g/kWh. GDP = 1.01%), Germany, (NOxc = 1.0 g/kWh, GDP = 1.85%), UK (NOxc = 1.3 g/kWh, GDP = 1.8%), Italy (NOxc = 0.5 g/kWh, GDP = 0.88%) are consuming much fossil fuel for elimination of NOx. Therefore electricity price is higher than no NOx elimination country and CO<sub>2</sub> assimilation is retarded. Agriculture and fish industry are retarded.

Japan did no NOx elimination before 1970, GDP was 8.0 in 1970. Japan started NOx elimination in 1980, then plankton production was destroyed and 13 million tone fish was not produced. About 2 million fisherman lost job.

When fossil is burned, carbon dioxide is emitted and about 1/25 NOx of produced CO<sub>2</sub> is also produced as by product. NOx is hated as pollution gas and many government set up the rule to eliminate NOx. Concentration of NOx in exhaust gas at the electricity plant is around 1.6 g/1kWh. Some country do NOx elimination with ammonia and some country do not do NOx elimination. Do NOx elimination or do not do NOx elimination give significant influence on economy, electricity price, import, export. agriculture, fish industry and GDP.

Japan emitted 12.5 billion tone CO<sub>2</sub>. Japan did not do NOx elimination before 1970 and NOx content was 1.6 g/kWh and 2 x 1.6 x 10080 = 64.2 million tone NOx was released. Since 1980, Japan government set up very strict law to eliminate NOx and drainage NP, Then NOx

Country	CO <sub>2</sub> em	CO <sub>2</sub> ep	NOxem	NOxcon	NOxeli	CO <sub>2</sub> fplank	DGP
	Bill t	t	Bill t	g/kWh	Bill t	Bill t	Growth Rate
China	106.4	6.1	4	1.6	0	19.8	6.9
USA	51.7	17.6	2	0.5	1	0.5	1.48
India	24.5	1.7	1	1.6	0	2.0	7.1
Russia	12.7	13.2	0.5			1.15	-0.22
Japan	12.5	9.1	0.5	0.1	0.5	0.11	1.03
Canada	5.5	14.7	0.22	1.3	0.1	0.25	1.4
Germany	5.5	9.1	0.22	1.0	0.1	0.07	1.85
France	3.2	5.6	0.12	1.0	0.06	0.083	1.2
S. Korea	5.8	11.5	0.23	1.6	0	0.083	2.8
UK	4.0	5.7	0.16	1.3	0.06	0.002	1.8
Italy	3.5	6.8	0.14	0.5	0.05	0.008	0.88

**Table 1:** CO<sub>2</sub>em, CO<sub>2</sub>ep, NOxem, NOxcon, NOxeli, CO<sub>2</sub>fplank, DGP of 11 contraries.

Note CO<sub>2</sub>em (CO<sub>2</sub> emission), CO<sub>2</sub>ep (CO<sub>2</sub> emission per person), NOxcon (NOx concentration in exhaust gas), CO<sub>2</sub>fplnk (CO<sub>2</sub> fixed by plankton)

concentration in exhaust gas decreased to 0.1 g/kWh and NOx emission decreased to 0.4 billion tone.

**Japan producing too many CO2 for the elimination of NOx**

I investigated how much CO<sub>2</sub> is produced by the elimination of NOx and NP in Japan.

Japan emitting 9.1 tone CO<sub>2</sub> per person. This value is too many in compared with France 5.6 tone, UK 5.7, Italy 5.7. Because Japan produce much CO<sub>2</sub> 11 billion ton for electricity generation. I found that Japan producing 2 billion tone CO<sub>2</sub> for the elimination of NOx [29] and NP in drainage and elimination of NOx at garbage incinerator exhaust gas.

**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>.

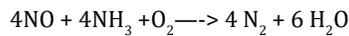
I investigated Yamazaki wastewater purification center at Yamazaki, Kamakura in Japan [31]. This center cover 96881 persons. Water 98287m<sup>3</sup> containing Nitrogen 40 mg/l, Phosphorous 4.2 mg/l is treated by activated sludge process. Air is bubbled for ten hours to give water containing Nitrogen 7.5 mg Phosphorous 2.7 31 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 indicate 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 wastewater purification is not done in Japan, 140 x 25 = 35 million tone CO<sub>2</sub> is fixed 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.

**Bon fire inhibition rule should be abandoned**

In Japan 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, 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 incinerator. Bon fire is inhibited by the reason bon fire produce much NOx. Burning of rice straw wheat straw at rice field is not possible. Big earth quake and tsunami happened in east Japan in 2011. Debris disposal was not allowed to burn on site. Debris disposal must transfer to far away district having high temperature incinerator consuming much fuel and money. Operation of this high temperature incinerator is using much excess fuel releasing much CO<sub>2</sub>. There is Nagoshi clean center at Kamakura, Japan near my house. This clean center burn garbage 0.03 million tone at Kamakura producing 0.045 million tone CO<sub>2</sub>. Exhaust gas contain NOx. By insertion of ammonia, NO is converted to N<sub>2</sub> by the reaction



This center bought 40.94 kg ammonia in 2018.

This mean  $40.94 \times 30/17 = 72.256$  kg NO is eliminated by ammonia at Negoshi clean center.

Population of Kamakura is 0.172 million. This data indicate  $72.256 \times 120000000/172000 = 50,41$  million kg NO is eliminated at burning of garbage in Japan.  $40.94 \times 12000/17.2 = 285.64$  million kg NOx is eliminated by 255 million kg ammonia. 255 million kg ammonia is produced from 54 million kg H<sub>2</sub>. If NOx elimination is not done 706 million kg CO<sub>2</sub> is not produced. 285 million kg NO x can fix  $285 \times 25 = 7,125$  million kg CO<sub>2</sub>.

Japan eliminating Nutrient nitrogen at 3 parts by producing much CO<sub>2</sub>. One is elimination of NOx at electricity generation plant by producing much CO<sub>2</sub>. About 1.5 billion tone CO<sub>2</sub> is produced for the production of H<sub>2</sub>. Two is eliminating of 35 million tone nitrogen at wastewater purification plant. Third is elimination of 25.5 million tone NO at garbage burning plant. Total  $50 + 35 + 25 = 1.11$  billion tone neutrinos nitrogen in Japan.

Population of Japan is 1.2 billion. By this rule, 50 million tone NOx emission stopped. And one billion tone CO<sub>2</sub> assimilation is retarded. Fish, rice, vegetable and fruit production retarded. Population of rural district decreased. 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 N nitrogen concentration of sea water. Japan is eliminating 0.5 billion tone NOx 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 8 million tone fish is  $8 \times 800000000 = 640$  billion USD. Japan losing fish 640 billion USD (540 USD per person) each year [31]. About 2 million fisherman lost job.

Grain production is also reduced greatly. Rice production reduced. 1970 12 million tone to 2018 7.82 million tone.

Since Japan started NOx elimination and NP elimination in 1980, agriculture and fish industry declined remarkably. GDP growth rate increased only 1.6% from 1985 to 2017. Government debt balance/DGP is 237%, worst in 188 countries. NOx elimination and NP elimination should not be done to protect decline of food production.

The countries who use NOx, NP are growing and increasing population. The countries who eliminate NOx, NP are declining and decreasing population [32]. DGP, food and population can be increased by effective use of NOx and NP [16,19,21,32,40-51].

## Conclusion

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**Volume 6 Issue 1 January 2020**

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