

“Kogai” and Pollution

<Personal notes for brain-storming>



27th April, 2018

@GEOC

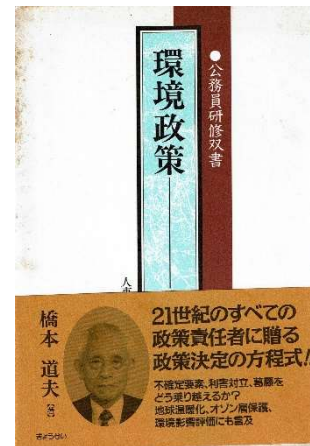
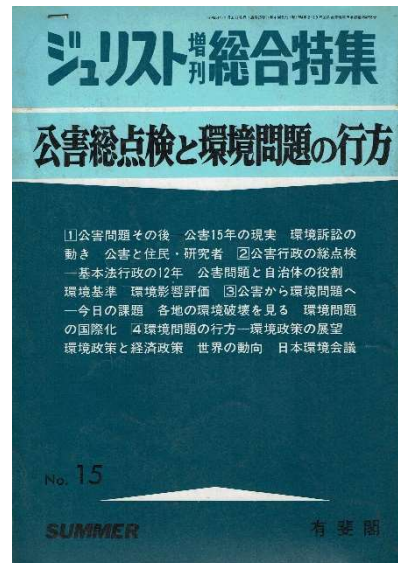
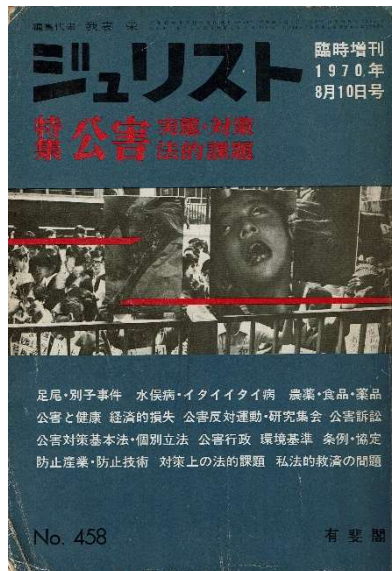
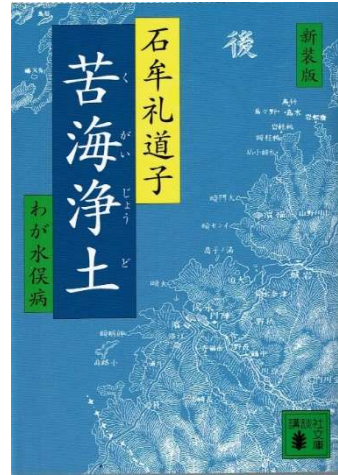
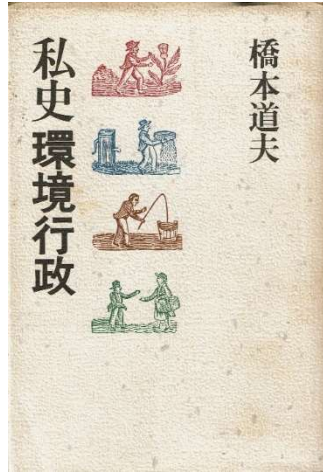
平石 尹彦

Taka Hiraishi

<taka.hiraishi@gmail.com>



References



“Kogai” vs. “Pollution”

- “Kogai” is defined in Article 2, Paragraph 3 of the Basic Law on the Environment; <Law No.91, 1993> <http://www.env.go.jp/en/laws/policy/basic/index.html>

Note; the translation of “Kogai”, as provided by the MOEJ (shown below) is not very accurate. The Article 2. Para 3 actually defines "Kogai" as occurrence of negative impacts caused by environmental pollution (of air, water, soil, noise, vibration, ground subsidence and offensive odour).

“Kogai” in Japanese means, among interference with environmental conservation, air pollution, water pollution (including a deterioration of water's unadulterated state other than the water quality and the quality of the bottom. The same shall apply hereinafter except for Article 16 Paragraph 1.), soil contamination, noise, vibration, ground subsidence (excluding subsidence caused from land excavation for mineral exploitation. The same shall apply hereinafter.) and offensive odors affecting an extensive area as a result of business and other human activities, which cause damage to human health or the living environment (including property closely related to human life, as well as fauna and flora closely related to human life and their living environment. The same shall apply hereinafter.).

Definition of “Kogai”

3 この法律において「公害」とは、環境の保全上の支障のうち、事業活動その他の人の活動に伴って生ずる相当範囲にわたる大気の汚染、水質の汚濁(水質以外の水の状態又は水底の底質が悪化することを含む。第十六条第一項を除き、以下同じ。)、土壌の汚染、騒音、振動、地盤の沈下(鉱物の掘採のための土地の掘削によるものを除く。以下同じ。)及び悪臭によって、人の健康又は生活環境(人の生活に密接な関係のある財産並びに人の生活に密接な関係のある動植物及びその生育環境を含む。以下同じ。)に係る被害が生ずることをいう。

Kogai problems in Japan

- Before Meiji Restoration
 - Mining pollution, local water conflicts, etc. Many agriculture-related cases.
- Meiji - Taisho era
 - Area-wide mining pollution cases, such as the Ashio mine pollution case. In 1890s.)
 - Industrial air pollution cases (e.g., Besshi, Hitachi)
 - Air and water pollution cases near large cities and industrial districts.
- More recently;
 - Many Kogai cases caused by environmental pollution from petrochemical industry zones and large cities after WW-II.
 - Health damage cases by toxic chemicals.

Minamata Disease

- Reporting of “Strange Diseases” started around 1953, but some believe that health damages started earlier. The symptoms were paralysis, speech impediment, eyesight narrowing, deformed birth, etc., but there were many discrimination incidents of patients because the causes were unknown.
- It took a long time before the causal relationship was established. Research report by a team of scientists of the Kumamoto University was issued in July 1959, but it was seriously criticized.
- A compensation agreement was concluded in August, 1959, which was negated by a court judgement later.

Minamata Disease (from E. Smith 「Minamata」)



チフス・水俣病：神経組織が変質、萎縮しはじめる。
まず手足のジンジンする感じおよび進行するしびれ。
運動機能はひどくそこなわれ、言葉は不明瞭になり、
視野は狭くなる。発症当初の車座席では
患者は無意識になり不随意運動を示すこともあった。
わけもなく叫んだりもした。死体解剖で脳を見れば、
細胞が脱落し海綿状になっている。
水銀は胎盤によって阻まれます
胎児にまで達することもなかった。
健康そうに見える母親の場合にも。

メチル水銀が母親から胎児に移る

Methyl mercury was transferred to the embryo, and thus Mother's damage is less serious!

Minamata Disease – was it preventable?

- Only in September 1968, the Ministry of Health and Welfare issued its official conclusion to the effect that Minamata disease was caused by organic mercury, generated in a chemical plant using inorganic mercury catalyst, emitted to the sea via industrial effluent, and accumulated in fish, and intake of such fish.
- Regrettably similar pollution and health damage cases occurred in Niigata in 1965. (Reportedly, health damages by organic mercury occurred in Canada in 1960s.)
- Difficulties involved:
 - Health damages by organic mercury was known only in a very special occupational health cases. (It was at a completely different contamination level.)
 - It was not known that inorganic mercury catalyzer (for hydration of acetylene) can be converted to organic mercury.
 - Detection of extremely low level of organic mercury (in fish or water) was not possible.
- There were “self-defensive” resistance by the industry.

Minamata Convention on Mercury (2013)

- Adopted in Kumamoto, on 10th October, 2013. Took effect on 18th August 2017.
- The Convention provides for; “a ban on new mercury mines, the phase-out of existing ones, the phase out and phase down of mercury use in a number of products and processes, control measures on emissions to air and on releases to land and water, and the regulation of the informal sector of artisanal and small-scale gold mining.”

TEXT

<http://mercuryconvention.org/Convention/tabid/3426/language/en-US/Default.aspx>

Introduction

http://mercuryconvention.org/Portals/11/documents/Awareness%20raising/FACT%20SHEETS/OVERVIEW_key%20control%20measures%20under%20the%20Minamata%20Convention_05%2016.pdf

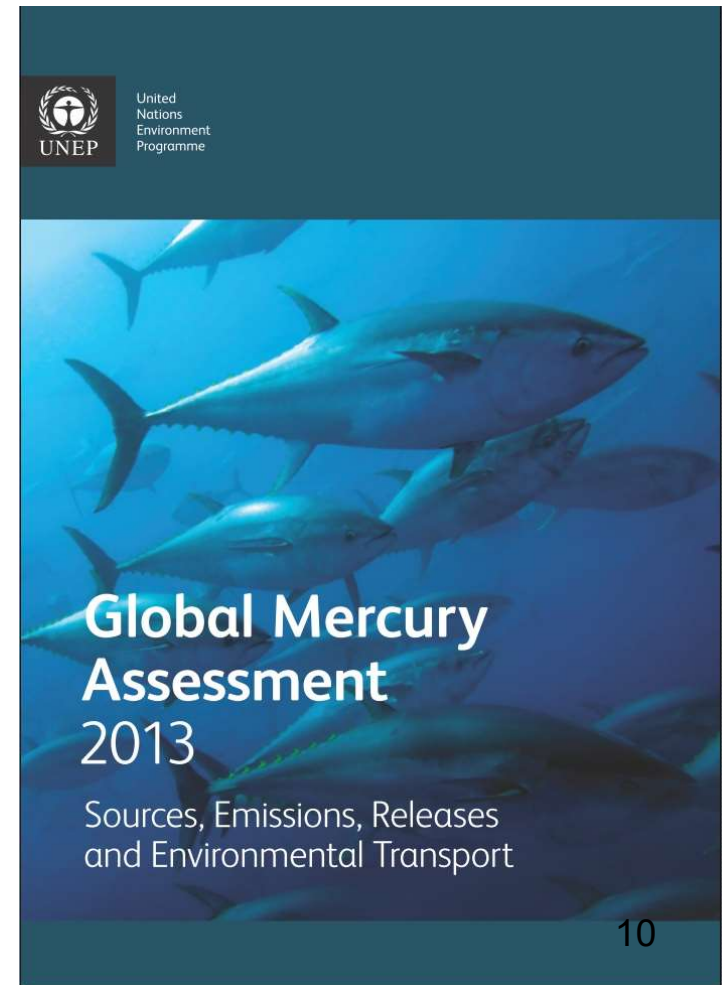
Overview in Japanese

http://www.env.go.jp/chemi/tmms/convention/treaty_outline.pdf

Global Mercury Assessment 2013 (UNEP)

- **“Global Mercury Assessment 2013: Sources, emissions, releases, and environmental transport” was an important background report for the negotiation.**

<http://wedocs.unep.org/bitstream/handle/20.500.11822/7984/-Global%20Mercury%20Assessment-201367.pdf?sequence=3&isAllowed=y>

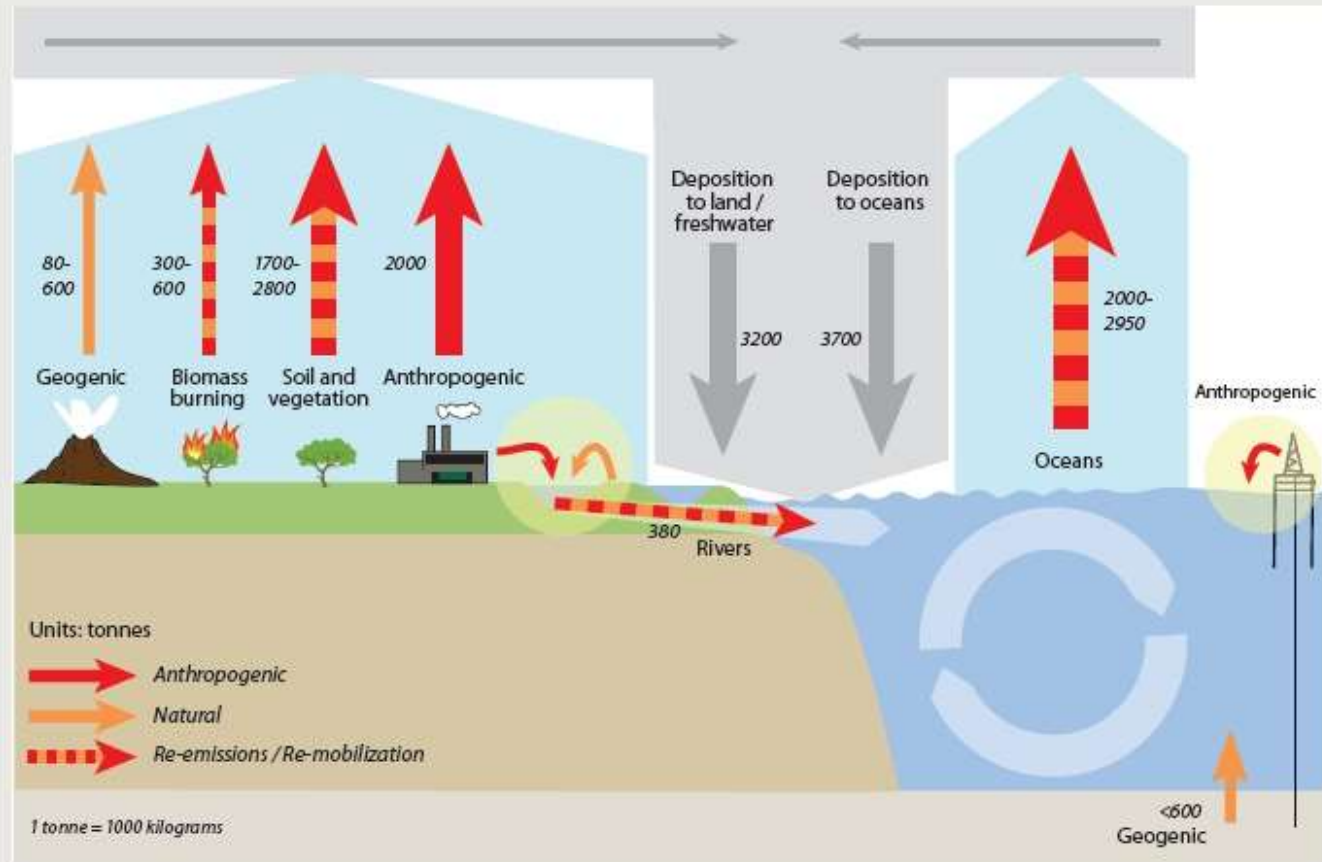


Large amount of Mercury exists in various sectors of nature, especially in higher food chain.

Global mercury cycling

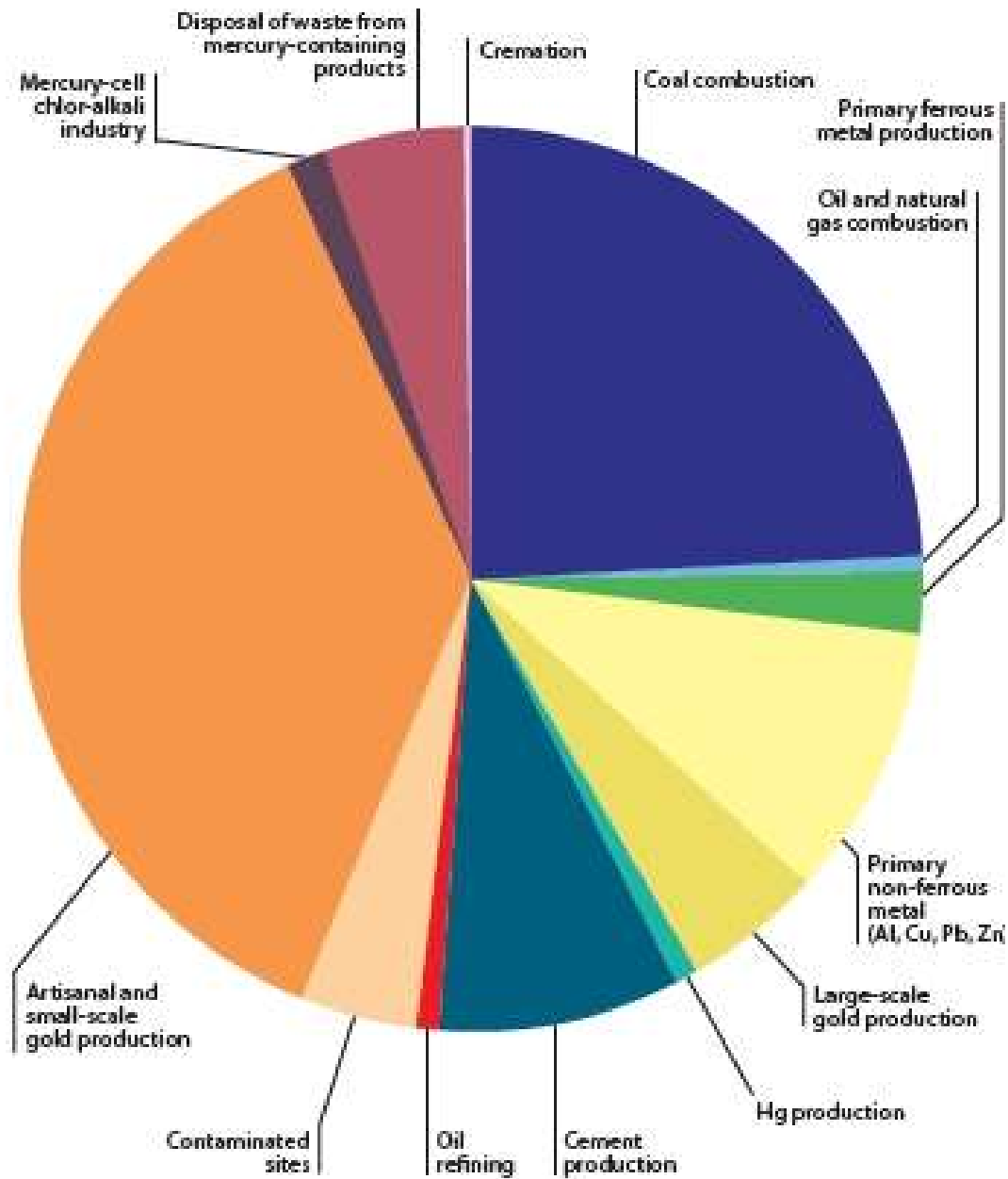
Mercury is released to the environment from natural sources and processes and as a result of human activities. Once it has entered the environment, mercury cycles between air, land, and water until it is eventually removed from the system through burial in deep ocean sediments or lake sediments and

through entrapment in stable mineral compounds. Methylmercury, the most toxic and bioaccumulative form of mercury, which presents the greatest health risk to humans and wildlife, is mainly formed in aquatic environments through natural microbial processes.



Global mercury budgets, based on models, illustrate the main environmental compartments and pathways that are of importance in the global mercury cycle, and the ways in which natural and anthropogenic releases to air land and water move between these compartments. Emissions to air arise from natural sources and anthropogenic sources, as well as re-emissions of mercury previously deposited from air onto soils, surface waters, and vegetation.

Emission sources of Mercury



Relative contributions to estimated emissions to air from anthropogenic sources in 2010.

水銀に関する水俣条約の主要規定

(環境省資料のサマリー)

水銀供給源と貿易(3条)

- 鉱山からの水銀の産出について、新規鉱山開発は各締約国での条約発効後に禁止。
- 既存の鉱山からの産出は各締約国での条約発効から15年以内に禁止。
- 水銀の貿易(金属水銀が対象)について、水銀の輸出は、1)条約上で認められた用途、2)環境上適正な保管(第10条)に限定。(水銀廃棄物の貿易については第11条で規定)
- 水銀の輸出に当たっては、輸入国の書面による事前同意が必要。

水銀添加製品(4条・6条)

- 電池、スイッチ・リレー、一定含有量以上の一般照明用蛍光灯、石鹼、化粧品、殺虫剤、血圧計、体温計などの水銀含有製品(附属書A、一部例外あり)について、**2020年までに製造、輸出、輸入を原則禁止**。(年限については、第6条に基づき、国によって必要な場合、最大10年間まで延長可)
- 歯科用アマルガムについて、使用等を削減。○
- 禁止された水銀含有製品の製品中への組み込みの抑制、水銀を利用した新製品の製造・販売の抑制、事務局へ附属書Aに掲載する水銀含有製品の情報の提案などを行う。
- 締約国会議(COP)は条約発効後5年以内に附属書Aのレビューを実施。

水銀又は水銀化合物を使用する製造プロセス(5条・6条)

- **塩素アルカリ工業及びアセトアルデヒド製造施設を対象に、製造プロセスにおける水銀の使用を禁止**。(それぞれ2025年、2018年まで。ただし、年限については、国によって必要な場合、最大10年間まで延長可。)
- 塩化ビニルモノマー、ポリウレタンなどの製造プロセスでの水銀使用を削減。
- 上記対象プロセス(附属書Bに記載)の**既存施設での対策及び新規施設での水銀利用禁止**、新規のプロセスにおける水銀利用の抑制、事務局へ附属書Bに掲載するプロセスの提案などを行う。
- COPは、条約発効後5年以内に附属書Bのレビューの実施。

人力小規模金採掘(ASGM)(7条)

- **使用・環境中への放出を削減、可能であれば廃絶のため行動**。
- 国内のASGMがわずかでない(more than insignificant)と判断する締約国は、国家行動計画を策定・実施するとともに、3年ごとにレビューを実施。

大気への排出(8条)

- 石炭火力発電所、石炭焚産業用ボイラー、非鉄金属精錬施設、廃棄物焼却施設、セメント生産施設(附属書D)を対象に、**排出削減対策を実施**。
- 新設施設:各締約国での条約発効から5年以内に**BAT(利用可能な最良の技術)/BEP(環境のための最良の慣行)**を義務付け。
- 既存施設:各締約国での条約発効から10年以内に①排出管理目標、②排出限度値、③BAT/BEP、④水銀の排出管理に効果のある複数汚染物質管理戦略、⑤代替的措置から1つ以上を実施。
- 各国が自国内の対象排出源の排出インベントリを作成。
- COPで、BAT/BEP等に関するガイダンスを採択。

水・土壌への放出(9条)、暫定的保管、水銀廃棄物、汚染地(10~12条)、資金・技術支援(13・14条)、など。

Itai-itai Disease

- Observed since 1920s, but the causes were left un-known.
- Multiple bone fractures, with serious pains. Serious osteomalacia (softening of bones) Occurred most frequently for old women who have delivered children.
- Malnutrition, Vitamin-D deficiency... were suspected causes, but Dr. N. Ogino and others led scientific research

Itai-itai disease: Causes and difficulties

- In May 1968, Ministry of Health and Welfare formally concluded that;
 - Those special symptoms were caused by chronic Cadmium poisoning, which caused kidney damage and bone softening, and they were triggered by pregnancy, breast feeding, disorder of internal secretion, aging and insufficiency in Calcium.
 - Heavy metals including Cadmium appears to have contaminated the water resources for paddy fields and ground water for a long time. . .
- Health damages caused by long-term intake of Cd was unknown, and caused delay in actions. Scientific discussions had taken a long time and continued even in international forums ...
- Removal of soil contamination, as well as management of mine effluent, are extremely time- and fund-consuming tasks.

Health Damages by Air Pollution

- Since 1960s, respiratory health damages increased in many industrialized and large cities. Yokkaichi, Kita-Kyushu, Kawasaki, Osaka. . .
- In addition to air pollution control measures (stringent SO_x, NO_x and PM emission regulations, including area-wide total mass emission regulations and automotive emission regulations, non-Lead petrol policy, etc.), Pollution Patient Compensation Law was enacted in 1973.

Pollution Patient Compensation System

- Pollution Health Damage Compensation Law was enacted on 5th October 1973, covering;
 - Non-specific diseases such as chronic bronchitis which do not have direct specific link with the emission of pollutant and sickness, (in the Designated Areas) and;
 - Specific diseases, such as Minamata and Itai-itai diseases, that have specific relationship with emission of causal pollutants.
- With the improvement of environmental situations, all the “Designated Areas” were cancelled in 1988. Including rather minor patients, there was a peak of some 110 thousands patients in 1983.

Environmental Protection Policy Tools

- Goals – Environmental Quality Standards
 - Air, Water (river, sea, groundwater), Soil, Noise and Vibration – nationally universal or land-use specific.
- Emission Regulatory Standards (point-based and region-based).
Chemicals control.
- Incentive/disincentive-based (Economic tools)
- Preventive measures (e.g., Environmental Impact Assessment)
- Regional Environmental Planning
- Environmental facilities (e.g., sewer system)

- Environmental Monitoring and reflection to actions.
- Environmental Research and Development.

From Failures to Successes

<http://www.city.kitakyushu.lg.jp/kankyoku/file_0264.html>



【1960年代】煙に覆われた空、多数のぜん息患者が現われた



【現在】澄み渡った青空

Environmental Quality Trends

- Environmental quality, today (English Summary)

<http://www.env.go.jp/en/wpaper/2017/index.html>

- Japanese (Original Report)

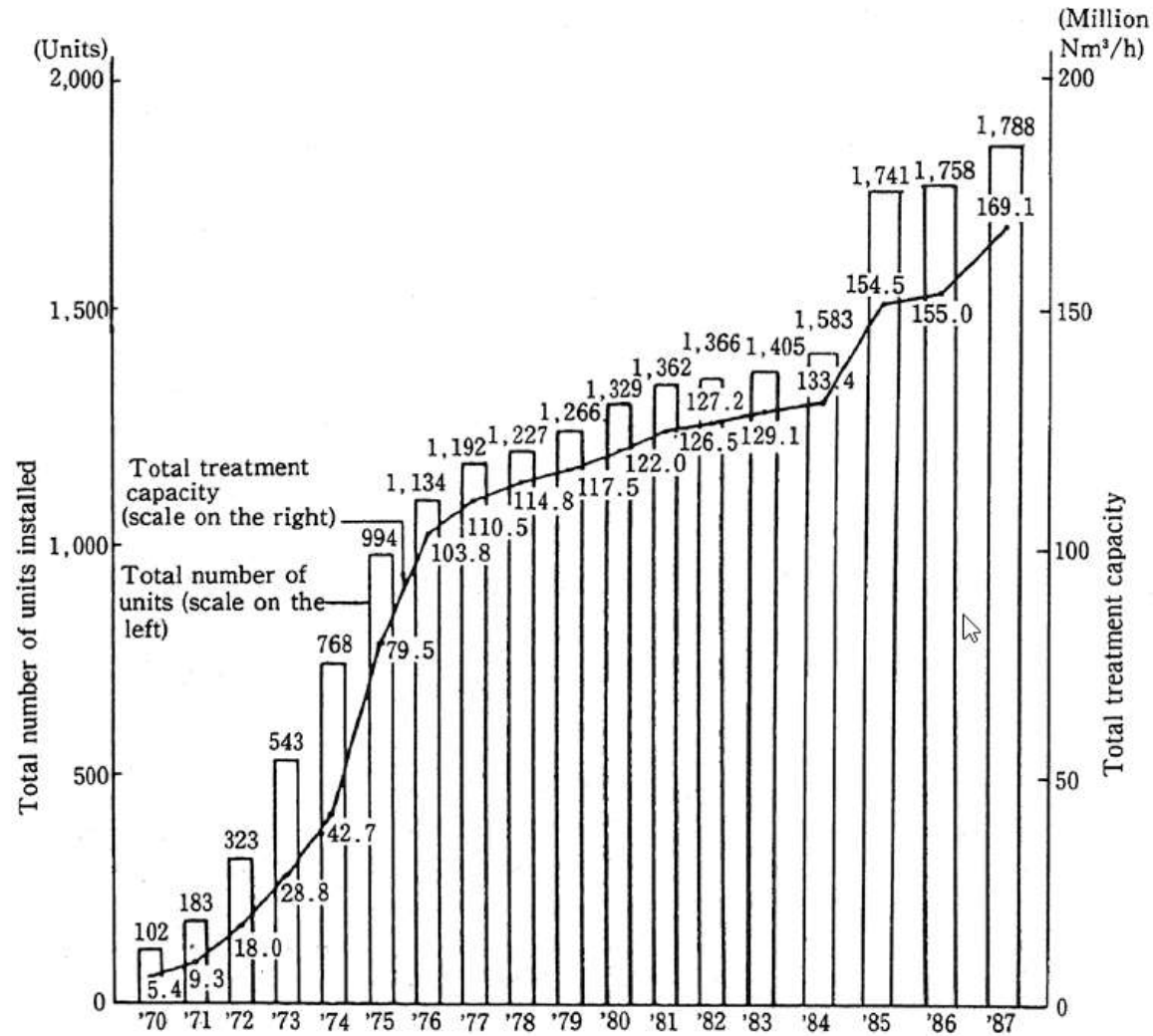
<http://www.env.go.jp/policy/hakusyo/h29/pdf.html>



SO2 Trends
FY 1970-2015

Flue Gas Desulfurization Facilities

Fig. 2-8 Changes in the Number and Total Capacities of Flue Gas Desulfurization Units



Note: Figures are as of January 1 for each year until 1982, and the ones after 1983 are as of March 31 of each year.

“Towards a Pollution-free Planet”

- a publication for UNEA3 -

- UNEA3 was held from 4th to 7th December in Nairobi, focusing on “Pollution”.

“**Pollution** is not a new phenomenon. Nor is action to counter it. A substantial framework of international conventions and national laws has been constructed to tackle some of the harms and worst excesses. Notable successes include the ongoing repair of the ozone layer and the phasing out of numerous banned pesticides and chemicals.”

- It overviews “Pollution”; Air pollution, Land and soil pollution, Freshwater pollution, Marine and coastal pollution, and Cross-cutting sources of pollution; Chemicals and Waste.
- Economic impacts and countermeasures and policies, including preventive ones, are reviewed.

http://wedocs.unep.org/bitstream/handle/20.500.11822/21800/UNEA_towardspollution_long%20version_Web.pdf?sequence=1&isAllowed=y



In Conclusion

- Japan has experienced numerous sorts of environmental pollution problems, including Kogai situations (even health damages).
- With unprecedented high determination and actions (by national and local governments, industries, civil societies and academia) and costs, Japan has coped with most of them. Such experiences could be, internationally speaking, extremely valuable resources.
- There are still many longer-term challenges – that all of us should be aware of, concerned with and take actions.

Taka Hiraishi

- Born in Tokyo on 3rd December 1944.
- B.Sc. (1966) and M.Sc. for Industrial Chemistry (1968) from Tokyo University.
- Joined Ministry of Labour (Occupational Health and Safety Department) in April 1968.
- Moved to the newly-established **Environment Agency** in 1971 and, till 1996, worked in the fields of offensive odour, acid rain, ozone layer, hazardous wastes, hazardous chemicals and water pollution, except the overseas posting shown below.
- 1987-1989: Director, Water Pollution Control Division, Environment Agency (current Ministry of the Environment) (1987-89)

Overseas posting:

•**1975-1978: Environment Attache (liaison with UNEP) and Second Secretary for bilateral technical co-operation (for Kenya, Uganda and Malawi) at the Embassy of Japan in Kenya.**

•1980-1982: Principal Administrator (A-4, information exchange on chemicals control policies, including chemicals management policies in developing countries), Chemicals Division, Environment Directorate, **OECD Secretariat.**

•**1989-1998: Worked for UNEP as (consecutively);**

- Co-ordinator of Support Measures, Programme Bureau (D-1),**
- Officer-in-Charge, Environmental Law and Institutions Centre,**
- Deputy Director of Policy Division,**
- Deputy Director of Environment Programme Division,**
- Assistant Executive Director for Environmental Information and Assessment (D-2).**
- (President, UNEP Staff Association (in 1996))**

More recently,

- 1999-2006: Visiting Principal Researcher, National Institute for Environmental Studies, Japan.
- 1999-2015: Member, IPCC Bureau and Co-chair, IPCC Inventories Task Force Bureau**
- 1999-2015: Senior Consultant, and Member, Board of Directors, Institute for Global Environmental Strategies (**IGES**), Japan (Part-time),
- February-April 2001: Special Advisor to the Minister of the Environment, Japan (Chair of Communique Drafting Group for G-7 Environment Ministers).
- 2002-2010: Special Advisor to the Minister of the Environment, Japan. (on OECD sustainable development activities, Part-time)
- 2005-2009: Specially assigned Professor (Risk Management and Global Environmental Issues), Osaka University, Japan (Part-time)
- Vising Lecturer for Tokyo Institute of Technologies, Sophia University, Gakushuin University, Osaka University, Atomi University.*
- 2001- : Contributed to the work of the Ministry of the Environment in Japan for CDM, J-VER, JCM, adaptation and “co-benefits”
- 2002-2011: UNFCCC, member of CGE (Consultative Group on non-Annex-I national communications).**
- 2004-2008: UNFCCC, member of EGTT (Expert Group on Technology Transfer)**

Currently:

- Counsellor, Institute for Global Environmental Strategies (IGES), Japan (Volunteer),**
- Member, Board of Directors, Japan Association for UNEP (NPO) (Volunteer)**