出國報告（出國類別：國際會議）

# 「出席亞洲石綿議題學術研討會」出國報告書

服務機關：行政院環境保護署

姓名職稱：王律之毒化物管理師

派赴國家：日本京都

出國期間：中華民國 99 年 12 月 3 日至 12 月 6 日

報告日期：中華民國 100 年 3 月 1 日

# 摘要

石綿之致癌性、危害性已被世界各國認同，且列爲毒性化學物質加以管制。由於石綿具有部分不可取代之特性，仍有許多產業於考量成本效益下必須繼續使用石綿，目前普遍之管制措施爲以限制用途與用量之方式加以管制。我國必須參考先進國家管制時程與管制作法，持續修正公告內容，使環境品質與勞工作業環境達到更高水準與要求，積極輔導國內石綿相關產業轉型，從經濟面及環境面等多重管道著手，使其採取自願性、自主性之減量措施，並鼓勵研發使用替代品。

日本京都立命館大學(Ritsumeikan University)立命館石綿研究專案小組(Ritsumeikan Asbestos Research Project)訂於 99 年 12 月 4-5 日於京都國際會議中心(Kyoto International Conference Center)舉行亞洲石綿議題研討會，本署應邀參加該研討會，報告我國目前石綿管制情況、並於小組討論等議程中與其它國家與會人員交換意見，持續瞭解國際針對石綿之化學品管制之趨勢及近況並執行環保外交工作。

# 目錄

# 圖目錄

# 壹、目的

參加本次會議主要有 2 大目的：

(一) 推廣我國執行石綿管制成效：我國環保署對於國際上關注的石綿議題及石綿對職場工作人員的健康影響，向來極爲重視。我國依毒性化學物質管理法，於 1989 年 5 月 1 日公告石綿爲毒性化學物質，陸續禁止石綿使用用途，環保署也同時呼籲廠商積極研發替代品及轉型因應，隨時注意掌握國內、外最新石綿管制措施，以逐步刪減石綿用途，符合國內外管制趨勢，參加此次國際研討會可與世界各國分享我國執行石綿管制之努力與成果，使世界各國更能瞭解我國於致力於環境保護之成果。

(二) 瞭解國際針對石綿之化學品之研究及其管制策略：本次會議參加國家以亞洲區域爲主，包括韓國、香港及日本等國之專家學者參加，探討的議題包括議程 一：亞洲石綿問題-醫療及流行病學部分；議程二：亞洲石綿問題之政策-社會科學部分；議程三：亞洲石綿跨科學領域之研究，因此參加此次研討會可以瞭解國際針對石綿之化學品之研究及其管制策略與未來影響，增加我國參與國際會議機會，推展環保外交：參加相關會議可與這些國際專家學者交換執行石綿之政策心得，推廣台灣執行的成效，達到環保外交之目的。

## 貳、行程與議程

### 行程：

| 日期 | 地點 | 行程說明 |
|---|---|---|
| 12/3 | 台北→日本京都 | 搭機前往大阪，再轉車至京都 |
| 12/4-5 | 日本京都 | 辦理報到並參加研討會 |
| 12/6 | 日本京都→台北 | 搭機返回台灣 |

### 議程：

**第一天：12月4日(六)**

上午: 會前會 10:00 -12:30

(Only guest speaker, Ritsumeikan research members)

下午: 開幕式 13:00 -13:30

開幕式

Dr. Kozo Watanabe (Dean, Division of Research, Ritsumeikan University)

引言

Dr. Hiroyuki Mori (Professor, Ritsumeikan University)

議程 1 –亞洲石綿問題: 醫療及流行病學部分13:30-17:00

“日本石綿相關疾病:醫療及流行病學之進展” Dr. Kenji Morinaga

(MD, Environmental Restoration and Conservation Agency, Japan)

“中國惡性胸膜間皮瘤之案例分析” Dr Li Tai

(Director, Professor, National Institute of Occupational Health and Poison Control, China)

“ 韓國石綿醫療及流行病學之進展” Dr. Dongmug Kang

(MD, Director, Korea Center for Asbestos Related Diseases, Pusan National University, Korea)

“推動台灣石綿及其產品之全面禁止” Dr. Jung-Der Wang

(MD,Chair Professor at the Department of Public Health of the National Cheng Kung University College of Medicine, Taiwan)

小組討論

Evening: Welcome Party 17:30-19:00

---

**第二天：12月5日(日)**

上午

議程2–亞洲石綿之政策問題: 社會科學部分 9:30-12:00

主席: Dr. Hiroyuki Mori(Professor, Ritsumeikan University, Japan)

“台灣石綿管制策略” Dr. Lu-Chih Wang

(Toxic Substance Control Specialist, Dept. of Environmental Sanitation and Toxic Substance Management, EPA, Taiwan)

“韓國石綿相關訴訟分析” Mr. Byun Young (Attorney, Korea)

“香港石綿相關政策” Ms. Karen Lo

(Chief Executive, Hong Kong Workers’Health Centre, Hong Kong)

“印尼石綿污染問題” Mr. Dwi Sawung Rukomo (Indonesia Friend of Earth)

“日本石綿使用及長期污染累積損害問題” Dr. Shinjiro Minami

(Researcher of Kinugasa Research Organization, Ritsumeikan University, Japan)

小組討論

下午

議程3 –亞洲石綿跨科學領域之研究

13:00-16:30

主席: Prof. Kazuhiko Ishihara(Professor, Ritsumeikan University, Japan)

專題演講

“在亞洲國家之石綿問題：和日本經驗之比較討論” Dr. Kenichi Miyamoto

(Professor Emeritus, Osaka City University)

“消除石綿相關疾病ＩＬＯ計畫” Mr. Seiji Machida

(Director, Programme on Safety and Health at Work and the Environment, ILO, Geneva)

ILO：國際勞動機關

綜合議題討論

石綿相關疾病-惡性間皮瘤造成之社會醫療成本

石綿議題在不同領域之統整研究

石綿災害散佈之因素

日本: Dr. Kenji Morinaga 韓國:Prof. Kim Ju-Young

台灣: Dr. Lukas Jyuhn-Hsiarn Lee、香港: Dr. Karen Lo

日本: Dr. Tsuyunori Sugimoto、日本: Dr. Takehiko Murayama

**閉幕式**

Dr. Monte Cassim (President, Ritsumeikan Asia Pacific University)

晚上: Farewell Party 17:00-19:00

# 參、會議內容與參加過程

## 一、 立命館大學石綿議題研究小組介紹

立命館大學「石綿研究小組」隸屬於立命館大學全球創新研究組織(Ritsumeikan Global Innovation Research Organization, R-GIRO)底下，人文以及社會科學類別之一個研究計畫，本計畫建立於 2005 年，計畫召集人爲立命館大學公共政策學系的 Hiroyuki Mori 教授。

本次會議是由立命館大學一個多年之研究計畫「石綿研究小組」主辦，該計畫成立於 2005 年，也就是日本發生久保田事件的同一年，當時石綿問題面臨到非常嚴重之社會議題。該事件曝光後，立命館大學之教授即開始發表一連串多方面及各領域之研究報告，2006 年起，受到龐大的資金資助，立命管大學石綿研究小組邁向一大步進展，自 2009 年起，石綿議題成爲立命館大學全球創新研究組織(Ritsumeikan Global Innovation Research Organization, R-GIRO)底下一個重要之研究計畫。這些活動促成許多成功之案例，包括舉辦國際研討會，邀請日本國內外石綿學者專家參與，並發表相關學術文章及書籍。

## 二、 本會議預期達成目標

爲期兩天的會議，主要討論自然科學以及社會科學再石綿議題上，如何克服跨領域之合作，石綿所造成之危害有可能是人類歷史最大的複雜累積(complex-stock)性災害，因此本會議可以提供一些建議，針對亞洲國家間的合作問題來加以突破發展。

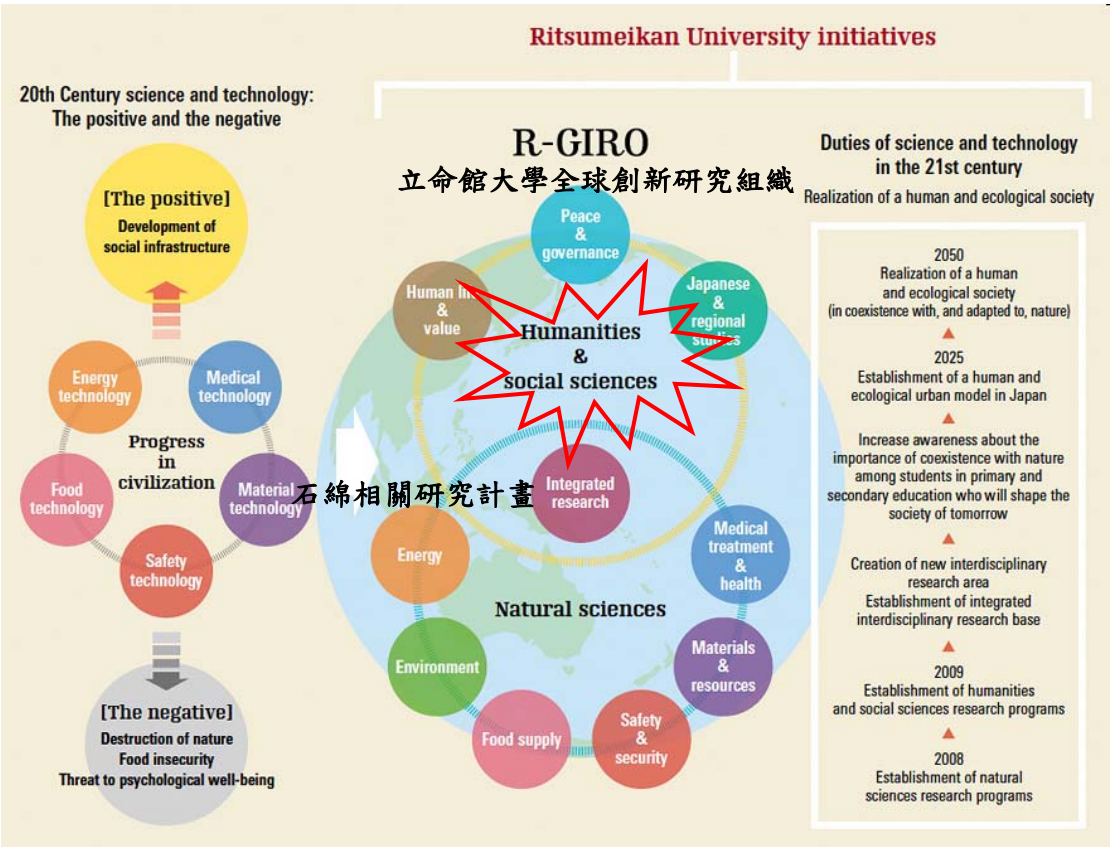



圖 1 立命館大學石綿研究小組

## 三、 各議題小組討論重點摘要

### 議程 1 –亞洲石綿問題: 醫療及流行病學部分

日本石綿礦業發展是在第二次世界大戰之後，因爲進口停止了，直到 2002 年才全面禁止生產石綿。石綿所造成的疾病包含了石綿肺症，惡性間皮瘤以及肺癌，目前多項研究指出，不只有青石綿及褐石綿會致病，白石綿也會造成以上石綿相關疾病。

### 議程 2–亞洲石綿之政策問題: 社會科學部分

1. 韓國 Attorney 公司 Mr. BYUN 報告了有關目前韓國正在進行之石綿相關訴訟案，其中包括了 JEIL 公司石綿受害者的訴訟案件，以及居民受到了石綿污染致病的訴訟案件，另外還有 JEIL 化學公司的員工家屬的相關訴訟案件。
2. 本署報告了台灣目前石綿之管制情形及未來管制策略
3. 香港則是由香港工人健康中心(HKWHC)的 Miss Lo 進行了有關香港目前石綿相關政策，有關香港石綿相關的法律制定皆爲 1997 年之前訂定的，該中心成立於 1984 年，屬於非營利組織，並在過去 25 年進行了許多的石綿相關議題政策的推動。香港是在 1996 年由香港環境部禁用褐石綿及青石綿，但是白石綿仍可使用或是進口，但近年來不論是進口或是出口白石綿的部分，均有逐年下降的趨勢。香港的建築業以及造船業是勞工會接觸到石綿的主要產業，過去老舊的建築物中也多含有石綿這項建材(石綿瓦)，勞工在重建老舊建築物時也會接觸到較多的石綿污染問題
4. 早稻田大學的 Dr. MINAMI 針對了日本的石綿使用問題也做了相關的報告，日本石綿災害問題因爲久保田事件受到社會的高度關注，石綿在日本已使用多年，石綿不論是用在哪一個經濟環節，從生產、使用及廢棄，都會對環境造成很大的污染，以大阪的泉南地區爲例，石綿受害者的集中地，來探討石綿對日本造成的危害。日本從 19 世紀就開始有石綿工業，1950~1990 石綿也大量的被使用，石綿大量使用在重工業及建築材料，因此石綿問題其實是跟都市化也有相關聯的。

**議程 3 –亞洲石綿跨科學領域之研究**

國際間石綿污染的傳遞問題，主要在於已開發國家，因爲對於石綿受害的嚴

重性較高，發現得較早，因此很容易因爲法規制定較嚴格，所以相關產業就會往開發中國家或是爲開發國家，因此石綿災害問題也陸續在這些國家中先後發生，例如美國開始訂定相關石綿法規後，石綿問題就開始往亞洲國家移動，日本可能是除了中國外石綿問題會最嚴重的國家。

## 四、各國石綿救濟法之比較分析

1. 韓國石綿救濟法

韓國石綿救濟法發布於 2010 年，並於隔年 2011 年生效，本救濟法補償對象主要爲無法經由一般勞工救濟(workers compensation)得到補償者，因得到石綿相關疾病而需要申請補償者，所謂”石綿相關疾病”有包括了惡性間皮瘤(Malignant mesothelioma)、肺癌(lung cancer)、石綿肺症(asbestosis)及其它因爲吸入石綿造成之疾病。

而因石綿造成之健康危害賠償之給付包括了醫療費用、療養津貼、葬儀費遺族慰問金、遺族葬儀費等，以上這些費用之給付應在 **3** 年內完成申請，但是遺族慰問金及遺族葬儀補助費用可以長其申請年限。另外居住於或住所靠近石綿礦場及石綿工廠(石綿工廠：使用或是生產石綿以及含有石綿之產品者)之居民可以申請”石綿相關健康影響調查(Asbestos Related Health Effect Investigation)”，由環保部級地方政府進行調查工作。

另外，由韓國環境部認定可能得到石綿相關疾病者，可以申請石綿健康管理手冊(Health Management Pocketbook for Asbesots)，持有該手冊者可接受定期之醫療服務。

本救濟法的經費來源主要是來自於地方政府(90%)，而另外 10%則由中央政府得負擔。

2. 香港肺塵埃沉著病補償基金會

肺塵埃沉著病補償基金會成立於 1980 年，是根據香港肺塵埃沉著病(補償)條例(附件)成立，該基金會的工作項目包括(1)管理基金 ; (2)就徵收比率向政府提出建議 ; (3)進行與資助預防肺塵埃沉著病及間皮瘤的教育、宣傳、研究及其它計畫, 並進行與資助患有上述疾病的人的康復計畫 ;(4)管理從政府收到的和政府指定作爲在 1981 年 1 月 1 日前經診斷爲患有肺塵埃沉覛病的人的特惠金的款項 ;及(5)履行本條例所委予的其他職責。

根據肺塵埃沉著病及間皮瘤(補償)條例規定，合乎領取補償資格的人士包括了：

(1) 在 1981 年 1 月 1 日或以後被診斷患上矽肺病 / 石綿沉覛病，並在本港連續居住滿五年*的人士，

(2) 在 2008 年 4 月 18 日或以後被診斷患上間皮瘤，並在本港連續居住滿五年*的人士

(3) 如申請人在本港居住未滿五年，則必須證明其肺塵病或間皮瘤(或兩者)在香港染上。

補償項目有：

1. 疼痛、痛苦與喪失生活樂趣的每月補償
2. 喪失工作能力每月補償
3. 判傷日期前喪失工作能力的補償
4. 護理及照顧方面的補償
5. 醫治費用
6. 醫療裝置費用
7. 肺塵埃沉覛病或間皮瘤(或兩者)引致死亡的補償
8. 親屬喪亡之痛的補償
9. 殯殮費

本基金會的成員是由各商會、醫學會以及勞工會選出後擔任，基金來源乃是向建造業及石礦業之雇主收取徵款，主要工作爲負責管理基金、由基金撥款補償予 1981 年起經診斷爲患有矽肺病或石綿沉著病人士、及因此病致死亡者之家署，另外的工作也包括了，積極推動有關預防肺塵埃沉著病及間皮瘤之宣導及教育工作、資助合適團體爲病人提供全面之康復服務。

3. 日本的石綿救濟法：

訂定於 2006 年，到 2010 年以前，因爲石綿相關疾病在本法訂定前致死的案例，共有 594 個肺癌，2429 個間皮瘤受到了補償。但是日本的石綿救濟法仍不完備，主要是因爲業者的配合程度的部分有待加強。

## 五、會議結束後之後續工作之討論

(1) 亞洲石綿國際學術研討會之意義及獨特性

-自然科學(醫療、工程)及社會科學(法律、經濟、社會及政策)間之相互影響

-石綿消耗及亞洲國家公共政策等多方面之情況

-亞洲石綿災害之快速成長及各國間之重疊問題

(2) 本會議未來之發展空間

-第一次會議之認知：希望開啓持續性亞洲石綿問題相互之學術性討論

-希望本會議可以由各會員國輪流召開

-避免某會員過分負擔

-會議之召開週期

-負責召開會議之國家應負擔來自其他國家講者之旅費及其他費用

-主辦國應訂定會議之內容及規模

-參與會議之其他國家應盡量配合

(3) 是否對本會議表示贊同，如果是請問對於未來本會議有何意見

(4) 對於本會議之 network 有何其他可能性

-在亞洲及其他區域針對石綿議題持續地交換資訊(e.g.會員發表之文章或文獻)

-其他

## 肆、心得建議

1. 目前許多亞洲國家仍在以”安全”爲理由在使用白石綿，然而根據研究證實白石綿對人體也具危害性，因此如果能使用替代品，其實長期來看是可以降低社會成本及經濟損失的，因此未來所有使用石綿的產品，包括白石綿，都建議應該被禁止，因此仍然因爲安全理由而在繼續使用石綿的亞洲國家應開始立法禁用。
2. 建築物在拆除時，大量的石綿污染會於空氣中產生，在日本，2020 年拆除建築物產生的石綿廢棄物量將達到高峰，這個問題也發生在韓國及其它亞洲國家，地震時造成建築物倒塌，也會造成大量石綿污染問題，因爲地震時人們比較不會注意到石綿污染防護的問題，因此建議我國應針對建築物的部分進行鑑定，避免因地震房屋倒塌造成石綿污染危害。
3. 石綿補償法訂定問題：在歐洲國家，石綿已禁止或限制使用多年，也在訂定了許多對於受害者的補償及救濟相關政策，並定期的做相關修訂；在美國，也有許多針對石綿問題的相關訴訟。在亞洲國家，不同的區域及國家，石綿使用量及公共政策也不同。日本近期遇到與多早期因爲經濟成長及大量的石綿使用而受到石綿污染的受害者，韓國近期也有建立相關的受害者補償制度。中國及印度仍然在繼續大量使用石綿，而台灣則因爲法令的禁止而石綿使用已大量在減少，然而被認定爲石綿受害者的案例仍然很少，因此建議可以提早訂定石綿補償救濟相關法令。

## 伍、結語

石綿的危害性已經被世界各國認同，列爲毒性化學物質加以管制，但是由於其具有部分不可取代的特性，因此，仍有許多產業在考量成本效益的狀況下必須使用石綿，目前以限制用途與用量的方式加以管制是比較普遍的措施。

藉由參加此次的會議，除了宣傳本國管制成效，重要的是了解到其他亞洲國家對石綿的管制經驗以及未來的管制計畫，石綿議題不單純只是自然科學問題，同時屬於社會問題的跨科學領域議題，石綿具有其複雜性以及長期累積之特性，對於環境的危害不單純只是單一國家的問題，更是國際間可能因貿易或各國法規嚴格度不同，造成石綿污染問題的持續存在。

在石綿的替代材料與技術日趨完整與先進的同時，石綿也將要進入全面管制的時代，這是全世界共同的趨勢與潮流。此外，積極輔導國內石綿相關產業轉型，從經濟面與環境面等多重管道下手，使其採取自願性、自發性的減量措施，並鼓勵學術界與產業界研究替代質材之可行性與效益，更能積極改善國內石綿危害的潛在因素。期能藉由不同的層面與角度，有效管理我國石綿產業的相關問題。

## 陸、會議相關照片

(1)

(2)

(3)

圖 2 立命館大學研究成員(1)左圖：**Dr. Kozo Watanabe** (Dean, Division of Research, Ritsumeikan University (2)右上：**Dr. Hiroyuki Mori** (Professor, College of Policy Science , Ritsumeikan University) (3) 右下：**Dr. Monte Cassim** (President, Ritsumeikan Asia Pacific University)


圖 3 研討會會場

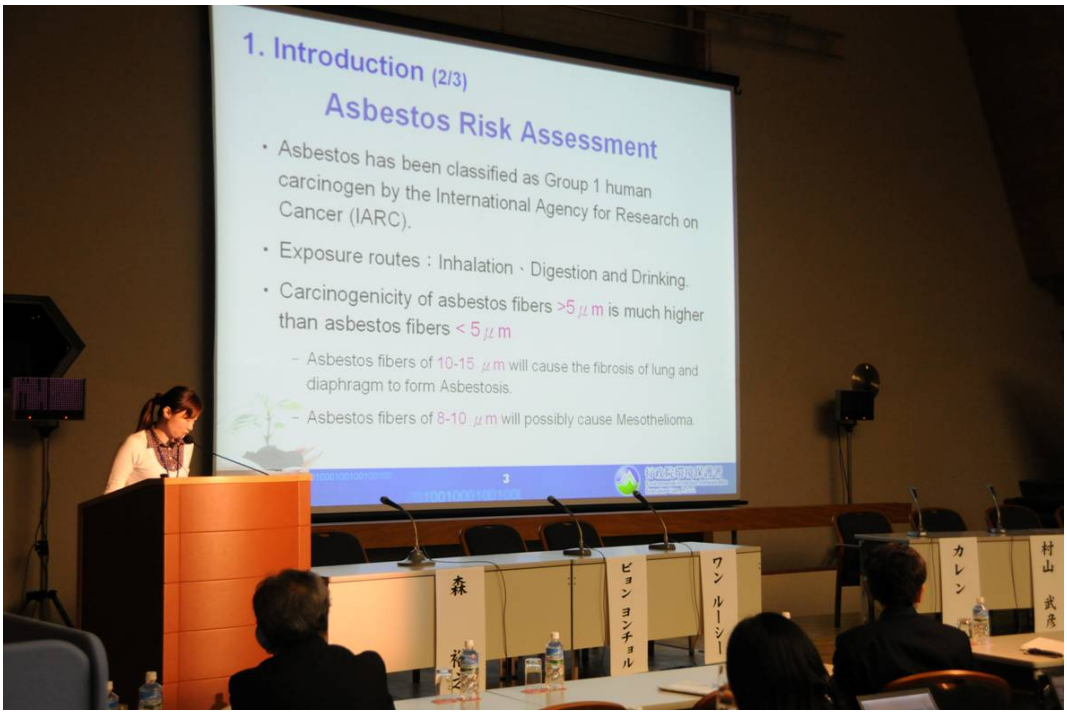



圖 4 本署代表報告情形


圖 5 小組討論會議

圖 6 小組討論本署代表發言情形

## 柒、參考資料

1. Dongmug Kang, “Asbestos Disasters in Korea: Medical and Epidemiological Approaches”International Academic conference on Asbestos problems in Asia, outline collection, 2010, 17-21

2. Karen Lo, “Policy Issues on Asbestos Problems in Hong Kong” Approaches”International Academic conference on Asbestos problems in Asia, outline collection, 2010, 41-44

3. 香港工人健康中心、肺塵埃沉著病補償基金委員會 “職業健康預防教育手冊”2010, 27

# 附件一、本次會議報告資料

# The Asbestos Management Strategy in Taiwan

Wang, Lu-Chih
Toxic Substance Control Specialist, Department of Environmental Sanitation and Toxic Substances Management, Environmental Protection Administration, Executive Yuan

**Abstract**

The Environmental Protection Administration (EPA) of the Executive Yuan listed asbestos as a regulated toxic chemical in May 1989 due to its high potential of causing carcinogen asbestosis and harming human health; the EPA also amended its related regulations and policies in 1991, 1996, 1997, 1998, 2005, and 2009. According to the existing regulations, business related operations, such as manufacturing, import, sale, and use of Crocidolite and Amosite are banned; the EPA also forbids all kinds of asbestos to be used in new and repaired drinking water pipelines and their parts. On December 30, 2005, the EPA announced that the use of asbestos in making plates, pipes, cements, and fiber reinforced cement plates would be banned starting January 1, 2008. On July 31, 2009, the EPA announced that the use of asbestos in manufacturing of synthetic resin (thickening agents), waterproof asbestos glue, seam filler, fireproofing, insulation, heat-preserving materials, asbestos belts, fabric, cords, washers, asbestos filters, asphalt (filler) manufacturing and asbestos anti-rust paint would be prohibited as of January 1, 2010. Also, new registrations for reference or approval of these uses would not be allowed as of the announcement date. Considering international trends and control measures on regulating asbestos, the EPA will still review and evaluate the banning of asbestos, which is used in products related to construction materials, and regulate it in-step with advanced nations in the near future.

## 1. Introduction

Asbestos is a general term for natural minerals consisting of fibrous shape salts of hydrous silicates. It can be classified into two groups: (1) Serpentine, which includes white asbestos or Chrysotile, etc.; (2) Amphibole which includes brown asbestos or Amosite, blue asbestos or Crocidolite, Anthophyllite, Actinolite and Tremolite, etc. The asbestos precipitants from open mines go through classification, drying and other processes to become raw ingredients of fibrous asbestos; white, brown and blue asbestos are most commonly used in commercial applications, and white asbestos is consumed the most in industry. Asbestos are used in construction, equipment, textiles and insulation materials.

After mining, asbestos breaks down into tiny fibers in the processing of various products, and particles can be suspended in the air in the form of dust pollution. Asbestos can be inhaled into the human body through the respiratory tract. It not only causes acute symptoms such as respiratory tract irritation, coughing and breathing problems, and burns caused by skin and eye contact; but also some chronic syndromes, such as lung cancer and gastrointestinal cancer. Asbestos has been classified as a Group 1 human carcinogen by the International Agency for Research on Cancer (IARC). Relevant studies demonstrate that there is sufficient evidence from animal tests to treat Chrysotile, Amosite, and Crocidolite as carcinogens.

Because the health hazards of asbestos have become more and more clear, countries worldwide are successively strengthening their asbestos control measures. This paper will discuss the asbestos control measures of the Environmental Protection Administration, Executive Yuan (EPA), the trends of international asbestos control measures, and the future outlook for Taiwan's asbestos control measures.

## 2. History of Asbestos Control Measures

Asbestos was announced as a toxic chemical by the EPA in May 1989, and related regulations on asbestos were revised in 1991, 1996, 1997, 1998, 2005, and 2009. The history of toxic chemical substance related regulations for managing asbestos is detailed in Table 1;

**Table 1. History for Asbestos Controlled as a Toxic Chemical Substance**

| Year | Announcement | Content |
|---|---|---|
| 1989 | Regulated toxic chemical | Announcement on May 1:<br>Announced substances containing 15% w/w of asbestos as a toxic chemical substance, and prohibited its use in newly-installed drinking water pipes. The controlled list number is 003-01. |
| 1989 | Elimination of exemptions on controlled items | Explanatory letters on November 7:<br>Substances already used on hardware facilities, such as pipelines, boilers, automobiles or trade articles and containing asbestos less than 15% w/w were not subject to this restriction. |
| 1991 | Prohibit the use of asbestos in drinking water pipes. | Announcement on February 27:<br>Use of asbestos in newly-installed drinking water pipes and piping components is prohibited; in-service water pipes and piping components may be used until unserviceable. |
| 1996 | Nine permitted uses | Announcement on October 17:<br>Permitted uses:<br>1. Research, experimentation, education;<br>2. Manufacturing of synthetic resin (thickening agent), waterproof asbestos glue, and seam filler;<br>3. Manufacturing of asbestos tiles, panels, pipes, and asbestos cement;<br>4. Manufacturing of fireproof, insulating, and heat-preserving materials;<br>5. Manufacturing of asbestos belts, fabric, cords, and washers;<br>6. Manufacturing of asbestos filters and asphalt (filler);<br>7. Manufacturing of brake linings;<br>8. Manufacturing of building materials and seam filler belts;<br>9. Manufacturing of asbestos anti-rust paint. |
| 1997 | Prohibit the manufacturing, import, sale, and use of Crocidolite and Amosite. | Announcement on February 26:<br>1. Controlled concentration standard: if the concentration of fibrous, filamentary, villous asbestos is 1% (w/w) or more. 2. The manufacturing, import, sale, and use of Crocidolite and Amosite are prohibited. However, use in experimental, research, and educational purposes is not subject to this restriction. |
| 1998 | Revise the controlled concentration standard and toxicity classification of asbestos. | Announcement on July 7:<br>1. Controlled list number: 003.<br>2. Minimum control limit: 500 kg.<br>3. The controlled concentration standard of asbestos: if the concentration of fibrous, filamentary, villous |

| | | |
|---|---|---|
| | | asbestos is 1% (w/w) or more.<br>4. Class II in toxicity classification: chemical substances possess characteristics that can cause tumors, teratogenicity, gene mutations, other chronic diseases, or impair reproductive capacity.<br>5. Augment the permitted uses: manufacturing of fiber cement board in item 10. |
| 1998 | Revise operation managements. | Announcement on December 1:<br>1. Controlled list number is 003, and batch number is 01.<br>2. Minimum control limit: 500 kg.<br>3. Controlled concentration standard of asbestos: if the concentration of fibrous, filamentary, villous asbestos is 1% (w/w) or more.<br>4. Toxicity classification: class II.<br>5. The manufacturing, import, sale, and use of Crocidolite and Amosite are prohibited. However, use in experimental, research, and educational purposes is not subject to this restriction. Use of asbestos in newly-installed drinking water pipes and piping components is prohibited; in-service water pipes and piping components may be used until unserviceable.<br>6. The storage site of asbestos should be a confined place, and asbestos should be packed into a container that effectively prevents spreading and leakage. |
| 2005 | Limited use control. | Announcement on December 30:<br>The use of asbestos in manufacturing asbestos panels, asbestos pipes, asbestos cement, and fiber cement board is prohibited since January 1, 2008. Also new registration for reference or approval of this use is not allowed since the announcement date. |
| 2009 | Limited use control. | Announcement on July 31:<br>The use of asbestos in manufacturing of synthetic resin (thickening agents), waterproof asbestos glue, seam filler, fireproofing, insulation, heat-preserving materials, asbestos belts, fabric, cords, washers, asbestos filters, asphalt (filler) manufacturing and asbestos anti-rust paint are prohibited since January 1, 2010. Also new registration for reference or approval of this use is not allowed since the announcement date. |

Source: Final report of "Screening/Holding/Management Planning and Analysis for Toxic Chemical Substances" in 2003, Environmental Protection Administration, Executive Yuan.

In 1989, asbestos was announced as a regulated toxic chemical based on the "Toxic Chemical Substances Management Act." In 1991, use of asbestos in newly-installed drinking water pipes and piping components was prohibited. In 1997, the manufacturing, import, sale, and use of Crocidolite and Amosite were prohibited. In 1998, the toxicity of asbestos was classified as a class II toxic chemical substance, and as a so-called chemical substance with the capabilities to cause tumors, teratogenicity, gene mutation, other chronic diseases, or impair reproductive capacity. In 2006, the uses of asbestos in building materials

were prohibited. In 2010, the use of asbestos in manufacturing of 14 materials including synthetic resin (thickening agents), waterproof asbestos glue, and heat-preserving materials, were publicized in a further announcement.

The regulated list number of toxic chemical, Asbestos, is 003; its molecular formula is 5.5 FeO, 1.5 MgO-8$SiO_2$·$H_2O$; its minimum control limit is 500 kg; its controlled standard is the concentration of fibrous, filamentary, or villous asbestos of 1% (w/w) or more. For the use of asbestos, the EPA not only forbids the manufacturing, import, sale, and use of Crocidolite and Amosite, but also forbids the use of all asbestos in newly-installed drinking water pipes and piping components. The EPA continues to keep track of asbestos control measures in advanced countries; review the management of toxic chemical-asbestos based on relevant experimental data and scientific assessments, and then enhances its own management. Currently, the permitted uses of Chrysotile include:

I. Studies, tests, and education;
II. Manufacturing of asbestos shingles, extruded cement composite hollow plates;
III. Manufacturing of brake linings;
IV. Manufacturing of asbestos filters, and asphalt (filler);

The damage from asbestos fibers is caused by inhalation, so the damage can be reduced greatly by solidifying asbestos. There are still some countries that allow manufacturing and use of asbestos in solidified products. Asbestos was forbidden to be used in the manufacturing of asbestos boards, asbestos pipes, asbestos cement, and fiber reinforced cement plates starting on January 1, 2008. But to comply with international management trends, the EPA augmented the fourth forbidden items in the announcement on July 31, 2009. Asbestos is forbidden to be used in the manufacturing of manufacturing of synthetic resin (thickening agents), waterproof asbestos glue, seam filler, fireproofing, insulation, heat-preserving materials, asbestos belts, fabric, cords, washers, asbestos filters, asphalt (filler) manufacturing and asbestos anti-rust paint starting on January 1, 2010. Furthermore, new registration for reference and approval of this use is not allowed as of the announcement date.

## 3. Related Waste Regulations Governing Asbestos

The related waste regulations governing asbestos in Taiwan are detailed as follows:

### (I) Announcement of "Standard Criteria for Identifying Hazardous Industrial Wastes" Revised on December 14, 2006.

In the related regulation on wastes, asbestos is defined as a substance considered hazardous industrial waste. The basis for identifying asbestos waste is the characteristics of the waste. The summaries of related regulations are as follows:

8. Article 4. "Asbestos and asbestos product waste" refer to industrial wastes possessing the following properties:
   (1) Materials used for rubbing, such as fire prevention, heat insulation and thermal insulation material and brake pads, etc, whose manufacture involve asbestos and which, in the finishing processes of grinding, polishing and drilling, produce highly dispersible waste.
   (2) Waste produced by the emission of asbestos in the course of construction.
   (3) Highly dispersible waste produced in the course of renovating or removing fire prevention, heat insulation or thermal insulation materials containing asbestos.
   (4) Containerized bags of which asbestos is a raw material.
   (5) Other waste containing one percent or more asbestos and of a highly dispersible nature.

**(II) Announcement of "Method and Facilities Standards for the Storage, Clearance, and Disposal of Industrial Waste" Revised on December 14, 2006.**

In the regulation "Method and Facilities Standards for the Storage, Clearance, and Disposal of Industrial Waste", asbestos is specified as a hazardous industrial waste that shall first undergo intermediate treatment. The standards of facilities and treatment methods in the intermediate treatment are specified in the regulation. The summaries of related regulations are as follows:

Article 20. Except if the hazardous industrial waste is reused or used in other applications regulated by the central authority, the following hazardous industrial waste shall first undergo intermediate treatment. The treatment methods are as follows:

15. Asbestos and asbestos product waste that contains hazardous industrial waste:

| Year | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Reporting amounts | | 54 | 53 | 50 | 67 | 67 | 96 | 29 |
| No. of operating sites | Operation =0 | 18 | 15 | 17 | 39 | 39 | 63 | 16 |
| | Operation >0 | 36 | 38 | 33 | 28 | 28 | 33 | 4 |
| Total operation (Tons) | | 3349.95 | 3345.48 | 2579.64 | 2164.85 | 2019.45 | 1360.73 | 1569.83 |

use moistening treatment followed by packaging in double-layer plastic bags with a thickness of 60/10,000 cm. Bags shall be tied twice, with the first tie leaving overhang at the knot-ends to be tied again; the bags shall then be stored in sturdy containers or employ solidification with measures to prevent airborne dispersal.

## 4. Effectiveness of Asbestos Control

The reported information on the controlled amounts and operation sites shows the data from Season I, 2004 to Season III, 2010. The internal operating sites of toxic chemical substances are described in Table 2:

**Table 2. Statistics Compiled from Reported Information on Asbestos Still In Use**
Source: "Toxic Chemical Substance Control System" of Environmental Protection Administration, Executive Yuan, October 2010.

According to the data, the production and import operations of asbestos amounted to 3349.95 tons in 2004; 3345.48 tons in 2005; 2579.64 tons in 2006; 2164.85 tons in 2007; 2019.45 tons in 2008; 1360.73 tons in 2009; and 1569.83 tons in 2010. The use of asbestos in plates, pipes, and cement was prohibited, and new registration or approval for related uses is terminated at the end of 2007. Asbestos was forbidden to be used in the manufacturing of synthetic resin (thickening agents), waterproof asbestos glue, seam filler, fireproofing, insulation, heat-preserving materials, asbestos belts, fabric, cords, washers, asbestos filters, asphalt (filler) manufacturing and asbestos anti-rust paint starting on January 1, 2010. Furthermore, new registration for reference and approval of this use was not allowed since the announcement date. The statistics show that the amounts of domestic use is decreasing gradually. In six years, the amounts of asbestos in use decreased by 1780.12 tons, which is 53.14% of the total amount in use in 2004.

For the number of sites operating with asbestos, in 2004, 54 were reported, of which 36 operating sites>0; in 2005, 53 operating sites reported and 38 operating sites>0; in 2006, 50 operating sites reported and 33 operating sites reported asbestos use>0; in 2007, 67 operating sites reported and 28 operating sites >0; in 2008, 67 operating sites reported and 28 operating sites>0; in 2009, 96 operating sites reported and 33 operating sites>0 and as of October 2010, 29 operating sites reported and 10 operating sites>0. The data shows that the number of operating sites is decreasing gradually in Taiwan, and there is a close relationship between related regulations, development of substitutes, and understanding of toxic chemical substances.

Consequently, the technical promotion and research and development of asbestos related industries are closely linked with progress in environmental laws. While analyzing external asbestos related control measures and collecting background data, the promotion and research trends of industrial technology should be taken into account.

## 5. Outlook of Asbestos Control

International control measures on asbestos were developed early in the 1970's. There are three stages of progress of control measures:

I. First stage: all the uses of Crocidolite and Amosite are banned, but not Chrysotile;
II. Second stage: the use of Chrysotile is restricted;
III. Third stage: the new uses of all asbestos are banned, except for uses that do not yet have appropriate substitutes.

Analyzing the control measures in these three stages, three different control stages were already covered in the announcements and revisions of related control regulations in Taiwan. The use of asbestos in manufacturing panels, pipes, cement, and fiber cement boards was prohibited on January 1, 2008. The use of asbestos in manufacture of synthetic resin (thickening agents), waterproof asbestos glue, seam filler, fireproofing, insulation, heat-preserving materials, asbestos belts, fabric, cords, washers, asbestos filters, asphalt (filler) manufacturing and asbestos anti-rust paint are further prohibited this year. An asbestos free environment is expected as soon as possible. The present asbestos control measures are shown in figure 1.

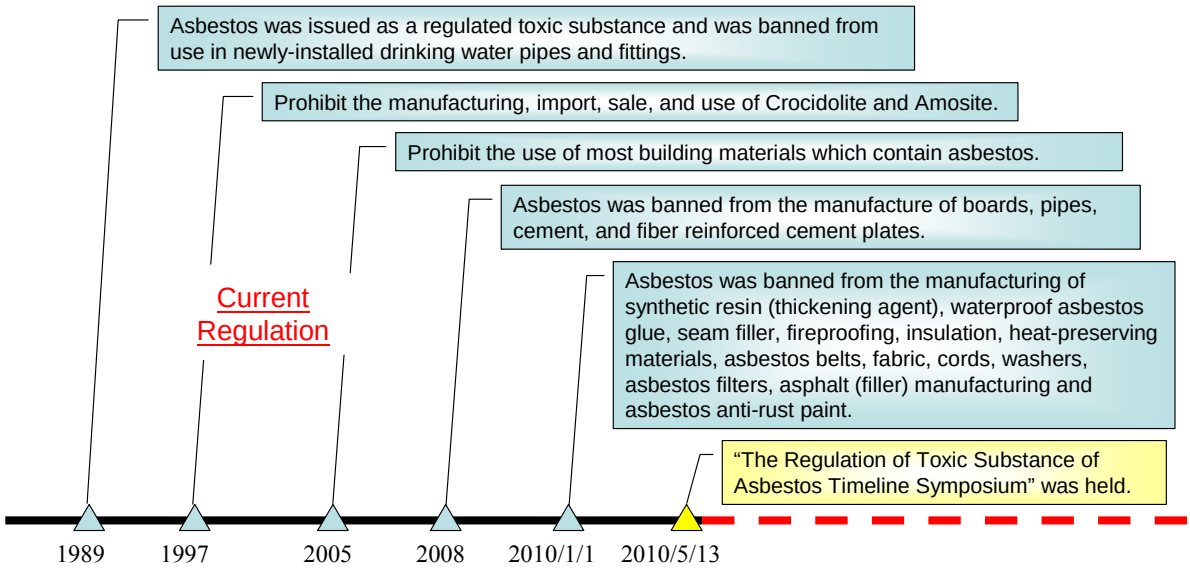



**Figure 1. Current asbestos control measures**

## 6. Conclusion

The damage of asbestos has been identified worldwide, and listed as a toxic chemical for control. There are still some properties that cannot be substituted, so some industries still have to use asbestos while taking the cost-benefit balance into account. The most common control measures are limiting the uses and amounts.

The alternative materials and techniques of asbestos are becoming more and more perfect and advanced. In the meantime, the control of asbestos is also stepping into a new era with total controls. This is a worldwide trend. Although the regulations of environmental protection and labor safety and health in Taiwan can satisfy the current demands, looking at future control trends, we still have to revise continually the contents of announcements according to the control progress and methods in advanced countries, and furthermore elevate the level and requirements of environmental quality and labor environments to a higher grade.

The EPA will start counseling the transition of asbestos related industries in Taiwan from economic and environmental angles and allow them to adopt reduction measures voluntarily and spontaneously, and encourage academia and industries to research the feasibility and benefits of alternative materials, and eliminate the potential hazards from asbestos in Taiwan. We hope that we can effectively manage the related problems related to asbestos industries through different angles and points of view.

## References


1. Environmental Protection Administration, Screening/Holding/Operation/Management Planning and Usage Analysis for Toxic Chemical Substances, Final Report 2003.
2. Environmental Protection Administration, Toxic Chemical Substance System Data Bank 2007.
3. Department of Mines, Ministry of Economic Affairs, Survey on Usages and Demands of Minerals in the Republic of China, pp. 85-103, 1993.
4. Bureau of Mines, Ministry of Economic Affairs, Silicate Minerals, Major Minerals and Rocks in Taiwan, 3rd , pp. 20-24, 2006.
5. National Economic Development and Labor Council, “The Socio-Economic Impact of the Phasing out Asbestos in South Africa”, Final Report, 2001.
6. Virta, R. L., “ASBESTOS”, U.S. Geological Survey 2005 Minerals Yearbook, 2006.

# 附件二、會議資料全文(摘錄)

# International Academic Conference on Asbestos Problems in Asia

## Outline Collection

**December 4th - 5th, 2010**
**At Kyoto, Japan**
**Kyoto International Conference Center**

**Sponsoring／Ritsumeikan Asbestos Research Project, Ritsumeikan University**
This conference is supported by Research Project of Ritsumeikan Global Innovation Research Organization(R-GIRO).

# International Academic Conference on Asbestos Problems in Asia
# Program

## December 4th (Sat.)

### Opening Session

| | | |
|---|---|---|
| 13:00 | Welcome Address | Dr. Kozo Watanabe (Dean, Division of Research, Ritsumeikan University) |
| 13:15 | Introduction | Dr. Hiroyuki Mori (Professor of Economics, College of Policy Science, Ritsumeikan University) |

### Session 1 "Asbestos Disasters in Asia: Medical and Epidemiological Approaches"

13:30 〈Reporter〉

| | |
|---|---|
| Dr. Kenji Morinaga | Department of Asbestos Health Damage Relief, Environmental Restoration and Conservation Agency (ERCA), Japan |
| Dr. Li Tao | Director, Professor, National Institute of Occupational Health and Poison Control, China |
| Dr. Dongmug Kang | MD, Director, Korea Center for Asbestos Related Diseases, Pusan National University, Korea |
| Dr. Jung-Der Wang | MD, Chair Professor at the Department of Public Health of the National Cheng Kung University College of Medicine, Taiwan |
| Dr. Norio Kurumatani | Professor, Department of Community Health and Epidemiology, Nara Medical University School of Medicine |

16:15 Discussion
Chairperson : Dr. Norio Kurumatani

17:00 Conference is adjourned

## December 5th (Sun.)

### Session 2 "Policy Issues on Asbestos Problems in Asia: Social Scientific Approaches"

9:30 〈Reporter〉

| | |
|---|---|
| Mr. Byun Young Chul | Attorney, Korea |
| Dr. Wang Lu–Chih | Toxic Substance Control Specialist, Environmental Protection Administration, Taiwan |
| Ms. Karen Lo | Chief Executive, Hong Kong Workers' Health Centre, Hong Kong |
| Dr. Takehiko Murayama | Professor, Waseda University, Japan |

| | | |
|---|---|---|
| | Mr. Dwi Sawung Rukmono | Wahana Lingkungan Hidup Indonesia (Indonesia Friend of Earth), Indonesia |
| | Dr. Shinjiro Minami | Researcher of Kinugasa Research Organization, Ritsumeikan University, Japan |
| 11:10 | Discussion<br>Chairperson: Dr. Hiroyuki Mori | |
| 12:00 | Lunchtime 12:00～13:00 | |
| **Session 3** | **"Toward an Interdisciplinary Study on Asbestos Problem in Asia"** | |
| 13:00 | Keynote Speeches I | Dr. Kenichi Miyamoto (Professor Emeritus, Osaka City University, Guest professor Ritsumeikan University, Japan) |
| 13:30 | Keynote Speeches II | Mr. Seiji Machida (Director, Programme on Safety and Health at Work and the Environment, ILO) |
| 14:00 | Break time 14:00～14:10 | |
| 14:10 | Panel Discussion | Chairperson: Prof. Kazuhiko Ishihara |
| | 〈Panelist〉 | |
| | Dr. Kenji Morinaga | Department of Asbestos Health Damage Relief, Environmental Restoration and Conservation Agency (ERCA), Japan |
| | Dr. Li Tao | Director, Professor, National Institute of Occupational Health and Poison Control, China |
| | Dr. Lukas Jyuhn-Hsiarn Lee | MD, Attending physician at Division of Environmental Health and Occupational Medicine, National Health Research Institutes, Taiwan |
| | Prof. Kim Ju-Young | Research Professor for KRCARD(Korea Research Center for Asbestos Related Diseases, Pusan National University, Korea |
| | Dr. Karen Lo | Chief Executive, Hong Kong Workers' Health Centre, Hong Kong |
| | Dr. Takehiko Murayama | Professor, Waseda University, Japan |
| | Dr. Tsuyunori Sugimoto | Associate Professor, Ritsumeikan University, Japan |
| 16:00 | Q&A | |
| 16:25 | Closing Remarks | Prof. Kazuhisa Hiraoka (Professor, Ritsumeikan University) |

# INDEX

## ◆Session 3 "Toward an Interdisciplinary Study on Asbestos Problem in Asia"

# President's Address

Kiyofumi Kawaguchi
President, Ritsumeikan University
Director, Ritsumeikan Global Innovation Research Organization

I would like to sincerely thank you all for your efforts and support in organizing the Ritsumeikan University International Academic Conference on Asbestos Problems in Asia.

Today's Conference will be held under the aegis of the Ritsumeikan Asbestos Research Project, an interdisciplinary research group led by the Ritsumeikan University College of Policy Science. This is a project that was initiated in 2005, when I was still Dean of the College of Policy Science. It was around this time, after disclosures concerning a high incidence of asbestos exposure-linked illnesses among residents living near an asbestos cement pipe manufacturing plant in Amagasaki, Hyogo Prefecture, that asbestos surfaced as a serious social issue.

Immediately after news of the disaster came to light, Ritsumeikan University faculty members representing a variety of research fields assembled and launched an interdisciplinary research group. The group has developed an energetic yet unique and multifaceted research quest comprising efforts to shed light on the actual scale of asbestos exposure and harm; examine past actions taken at the corporate and government levels in response; explore measures in prevention as well as relief and compensation for victims; and conduct international comparative studies.

Asbestos-related research at Ritsumeikan University has made huge strides since the 2006 academic year, after receiving grants-in-aid for scientific research and other sources of public grant funding. Starting in the 2009 academic year, asbestos research themes have been considered priority projects within the Ritsumeikan Global Innovation Research Organization (R-GIRO).

These activities have produced many successes ranging from the hosting of international symposia participated by leading experts on asbestos issues from Japan

and abroad, to the publication of books and academic papers and the presentation of papers at academic conferences on asbestos-related themes. This conference, to be held today and over the next two days, will also be one of our most significant successes.

The defining characteristic of today's conference lies in how the natural and social sciences have been able to overcome their interdisciplinary boundaries and cooperate to tackle the asbestos crisis, possibly the largest complex-stock disaster thus far in human history. Indeed, the asbestos issue ranks as the single most important theme among all interdisciplinary project-led research now under way at Ritsumeikan University.

The various successes of today's conference should give us a good idea as to how we can tackle the challenge of creating sustainable development and prosperity through cross border cooperation in Asia, one of our biggest challenges of the 21st century.

I truly hope that the today's conference will form an important cornerstone in shaping the future of Asia and the world at large.

# The Significance of Interdisciplinary Studies in Asbestos Disasters

Hiroyuki Mori※

## 1. Asbestos Problems: Complex-Stock Disasters

Asbestos disasters have different characteristics from typical labor accidents and environmental pollutions. Two implications are derived from the social scientific perspective applied here.

The first is "complexity." Asbestos causes damages in every economic process. Raw asbestos rocks are mined from mines and are processed for asbestos materials. They are utilized to produce such industrial goods as steel, electricity, maritime ship, railway train, chemical fertilizer, oil chemical, automobile, building and so forth. These products are consumed by businesses and consumers, and disposed as wastes. Thus asbestos causes labor disaster and environmental pollution in every economic process from mining to processing, manufacturing, consumption, and dumping. Asbestos disasters combine labor accidents and pollutions from air, consuming products, and wastes. This characteristic is named complex disaster.

The second implication is the "stock pollutant" nature of asbestos. Illnesses or medical conditions resulting from relatively short-term exposure to air or water contamination are typically treated as outcomes of "flow disaster." Asbestos disasters, on the other hand, are an example of stock disaster. There are two meanings of "stock." One is that the symptoms of health problems stemming from exposure to asbestos take from 10 to 50 years to become manifest. The other is that asbestos will continue to cause health problems as long as accumulations of this material remain in products and environment, even after society is to completely ban the manufacture and utilization of all asbestos products. In other words, we describe as a phenomenon of "stock pollution" the harmful effects that arise after long-term exposure to toxic materials that have accumulated in human tissues, products, or the environment.

Complex-stock disasters raise serious issues for both natural science (especially medical and epidemiological sciences, and engineering) and social science. For natural sciences, it is much harder to confirm the causal relations between asbestos exposures and their harms. Although medical knowledge on asbestos toxicity was mostly established, it requires considerable efforts to prove when and how damages are brought from asbestos-type stock pollutants. Social sciences are required to connect specific damages with socio-economic structures and policy measures concerning

※ Professor of Economics, College of Policy Science, Ritsumeikan University
E-mail: hmt23243@sps.ritsumei.ac.jp

asbestos. These studies lead to compensation and relief for the damages. However, social sciences also find it difficult to perform them owing to the complex and stock characters of asbestos disaster.

## 2. Asbestos Disaster as Public Health Problem

Asbestos extensively damages health of workers and residents. Asbestos disaster is one of the important issues on public health.

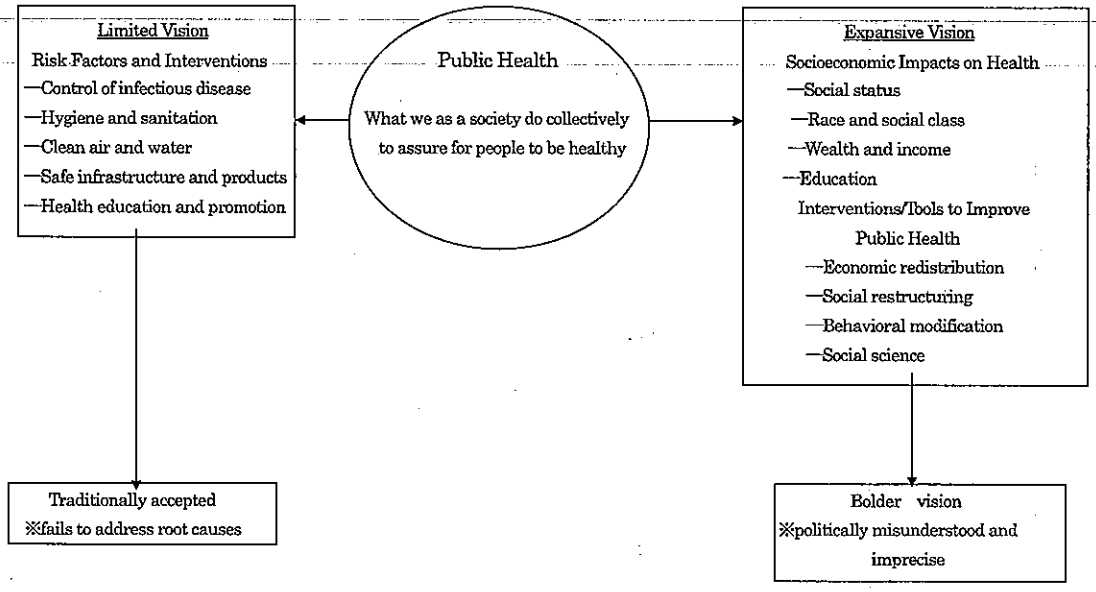
The core issues of public health are subject to medical science. Medical science covers not only individual health problems but also socially expansive health issues such as infectious diseases. As a field of public health, asbestos disasters have clinically and epidemiologically studied.

Public health is closely connected to social sciences. Pure conditions of workplace and living do not cause specific health problems in workers and residents. There are a series of social conditions of individual, family, living environment, workplace, community, economy, politics, public administration, and others. These affect and generate particular victim groups in workers and residents.

The character of public health calls for both the narrow range of medical sciences and the broad range of social, economic, political, law, and other sciences. Though these sciences are academically independent, they must collaborate and unify each others to solve public health problems. In epidemiology, it was once proposed that social science in public health can be treated under four heads; (1) Social factors in health and disease. (2) Patients as social beings. (3) Health professionals in relations to patients (professionals as social beings). (4) Systems of health and medical care[1]. From the social scientific view, the broader field of public health is showed (Figure 1).

---

[1] Mervyn Susser, *Epidemiology, Health, & Society*, Oxford University Press, New York, 1987, pp.177-185.




Note: modified from Lawrence O. Gostin, ed., *Public Health Law and Ethics*, University of California Press, Berkeley, 2010, p.7.

Figure 1 The Field of Public Health

It is obvious that both narrow and broad approaches collaborate to understand public health issues and achieve healthier conditions through public policies. In order to control a spread of a particular infectious disease, it is necessary to construct water and sewage works, legislate for improving them, and levy tax and user charges to raise revenues. Moreover, urban planning, housing policy, waste disposal policy, and social regulations are imperative.

The principle of public health study is completely applicable for asbestos disaster. In addition to medical treatment and protective measures in medical and engineering sciences, policy tools for safe workers conditions, air pollution control, industrial regulations, compensation and relief systems, and educations concerning work and environment are all into areas of social scientific approaches.

The realities of public health problems are varying in times and nations or regions. This study is the business of social science with the comparative institutional analysis.

## 3. Toward Interdisciplinary Study of Asbestos Problems in Asia

In Europe countries, the asbestos policies lay stress on compensation and relief for victims, since they have banned or severely restricted asbestos usage for long. They have sequentially investigated and institutionalized or modified compensation and relief systems. In the United States, a lot of lawsuits against the companies have been brought in for solving the asbestos problems.

In Asia, situations in asbestos consumption and public policies on asbestos are diverse in nations and regions. Japan has recently facing more and more asbestos

victims because of its early economic growth and huge amount of asbestos consumption. They have been compensated or relieved by workers accident compensation insurance or the Act on Asbestos Health Damage Relief. The number of lawsuits against the government and companies has risen to more than 50. Legal responsibilities by the companies and the government for asbestos victims have been recognized and judged by courts. In Korea, the government established relief system for asbestos victims. Several lawsuits against the asbestos companies have been in dispute. China and India continue to consume asbestos under control use. Taiwan has experienced a rapid increase in asbestos diseases caused by asbestos manufacturing, ship breaking, and others. However, the number of workers accident compensation authorized as an asbestos victim is only a few. Hong Kong has employed a unique compensation fund system that collects money by taxing construction works. In Indonesia and Thailand, asbestos disasters as social phenomenon have not become public. In Bangladesh, approximately half of overage big ships in the world are demolished and the workers suffer from toxic substances including asbestos.

Thus, in reflecting the economic developments and conditions in Asian countries and regions, the realities of asbestos problems and policies are quite varying. It means that comprehensive asbestos studies and policies are requisite through interdisciplinary collaboration between natural and social sciences with Asian experiences.

# Asbestos-Related Litigation in Korea Today

**BYUN, YOUNG CHUL**
Attorney

## 1. JEIL CHEMICAL litigation by victims of asbestos

### A. WON, JUM SOON

May, 2005 Surviving relatives of WON, JUM SOON sued JEIL CHEMICAL in Daegu District Court (2005A, Case 51553) demanding compensation for damages

Dec. 4, 2007 Case was decided against JEIL CHEMICAL awarding 4 surviving relatives 150,000,000 KRW in damages
JEIL CHEMICAL did not appeal

* WON, JUM SOON(Female)
1976. 2. 4. Joined company, worked in charge of spinning frame at textile factory, chrysotile Asbestos section
1978. 2. 28. Left company
2004. 7. 27. First diagnosed with malignant mesothelioma
2004. 8. 17. Right pneumonectomy, removal of parietal pleura
2006. 10. 23. Death

### B. JUNG, NAN HEE, PARK, YOUNG GOO, HA, KYUNG SAENG

2007. 12. 26. Filed suit at Busan District Court(2007A Case 25134)

* JUNG, NAN HEE(Female)
~1969 Joined company, worked in a division handling chrysotile asbestos
1975. 9. Left company
2007. 10. 1. Diagnosed with a malignant mesothelioma tumor at Donga University Hospital

* HA, KYUNG SAENG (Female)
1973 (mid)~1978 (end) Worked as spinner in crocidolite section
1993. 6. 7.Diagnosed with asbestosis
1995. 10. 26. Died from pulmonary heart disease due to asbestosis

* PARK, YOUNG GOO(Male, husband of HA, KYUNG SAENG)
1971(early)~ 1978 (end) Worked in chrysotile asbestos section
2007. 12. 12. Diagnosed with asbestosis

* 2010. 6. 16. Ruling at first trial (in favor of JUNG, NAN HEE, PARK, YOUNG GOO , HA, KYUNG SAENG lost due to extinctive prescription), 2010. 9. 13. Statement of appeal submitted at second trial)
First date of plead of appeal will be scheduled soon (Busan High Court 2010B 7508)

### C. KIM, HYUN IN and 21 others

2008. 12. 10. 16 workers and surviving relatives sue for damages at Busan District Court (Defendants include NICHIAS and Republic of Korea, 2008A, Case 23685)

### D. KIM, DONG JIN and 3 others

2009. 9. 29. Workers and surviving relatives sue for damages at Busan District Court (Defendants

include NICHIAS and the Republic of Korea, 2009A Case 19737)

**E. JUNG, OE SOO and others**

2009. 12. 30. Workers and surviving relatives sue for damages at Busan District Court (Defendants include NICHIAS and the Republic of Korea, 2009A Case 26285)

The above cases KIM, HYUN IN and 21 others, KIM, DONG JIN and 3 others, JUNG, OE SOO were scheduled to be argued on 2010.10.21, but due to preparation time needed by attorney for defendant NICHIAS, the date was postponed to 2010.11.11. It is expected that a decision will be handed down after each plaintiff's monetary amount they are seeking in damages is evaluated on the date of the plea.

**2. Litigation by Citizens Demanding Compensation for Damages**

* 2008. 11. 13. Surviving relatives of KIM, KANG SOO, and WON, HAK YEON, who died of malignant mesothelioma tumor while residing near JEIL CHEMICAL filed suits against JEIL CHEMICAL, NICHIAS and the Republic of Korea at Busan District Court (2008A Case 21566)

* 2009. 5. 14. Examination of witness KANG, DONG MOOK, professor at Busan University's Graduate School of Medicine

* 2009. 7. 9. Examination of witnesses IBE MASAYUKI (Japan) and PARK, YOUNG GOO(JEIL CHEMICAL worker)

*2009. 9. 23. Order for relevant facts directed to Seoul National University's Graduate School of Health, Busan District Labor Office, and National Health Insurance Complex

* 2009. 9. 24. Examination of witnesses JUNG, SOO BOK(worker at JEIL CHEMICAL) and HONG, BYUNG SOO(JEIL ENS Executive Director)

* 2010. 8. 17. Arrival of relevant facts from Seoul National University's Graduate School of Health, etc.

* 2010. 8. 18. Order for relevant facts regarding medical fees to ULSAN UNIVERSITY HOSPITAL

* 2010. 10. 21. Scheduled date for plea
(It is expected that the date will change to allow NICHIAS's attorney to prepare for case. New date is expected to be set for 2010. 11. 11)

* A final decision is expected to be entered on the date of plea

**3. Administrative Litigation by surviving relatives of JEIL CHEMICAL workers**

* The surviving relatives of JEIL CHEMICAL workers who died from asbestos-related diseases requested damages from Korea's Worker Welfare Complex, but because more than 3 years had passed since the death of the victims, it was determined that extinctive prescription was to be applied in respect to receiving insurance payments, and payment request was refused. Subsequently, on 2009. 2. 5 PARK, YOUNG GOO and 3 other surviving relatives filed administrative litigation against the refusal of Korea's Worker Welfare Complex (2009A Case 892)

* 2010. 6. 9. Following fifth round of plea it was decided to later specify a date for pleading in order to examine the results of relevant civil cases

# Policy Issues on Asbestos Problems in Hong Kong

**Karen Lo**

Hong Kong Workers' Health Centre

***Background***

Hong Kong is a small city in South China with total populations for around 7,106,366 at 2010. It was a colony of United Kingdom before 1997 while it became a Special Administrative Region (SAR) of People Republic of China (PRC) afterwards. All the main policies in relating to asbestos were passed and enacted before 1997 except the inclusion of mesothelioma in the Pneumoconiosis Compensation Ordinance at 2008.

Hong Kong Workers' Health Centre (HKWHC) is a non-profit making organization established in 1984. HKWHC is formed by medical doctors, rehabilitation therapists, the occupational safety & health professional and social workers. For the past 25 years, HKWHC devoted to the promotion of occupational health, prevention of workplace injuries and diseases, protection of workers' health, and assisting people with work injury or occupational disease to return to work and participate in community life. For the past 25 years, HKWHC advocates the banning of asbestos, establishes a comprehensive compensation and rehabilitation support services for people in suffering from asbestosis and mesthelioma.

***Banning of Asbestos***

Since 1996, Amosite (brown asbestos) and Crocidolite (blue asbestos) were banned by Environment Protective Department in Hong Kong. Under s.80 of Air Pollution Control Ordinance (Cap.311), a person shall not import into Hong Kong or sell any quantity of asbestos known as Amosite or Crocidolite or any substance or item made with or containing both. Unfortunately, other kind of asbestos such as Chrysotile (white asbestos) can be imported into, manufacture and exported in Hong Kong. Obviously, the health of citizen is still threatened by hazard of asbestos. HKWHC continues to pay effort in advocating the total banning of asbestos in Hong Kong. HKWHC regularly requests the government to publish information on regarding the import and export of products with Chrysotile through Legislative Council member of HKSAR. And the recent reply by government at 2008 was summarized as follows:

Press Release of Hong Kong Government: Controls on asbestos works and asbestos containing materials
**********

(October 29, 2008) At present, the use of asbestos containing materials in the construction and other industries has been largely replaced by asbestos-free products. The quantity of imported asbestos containing materials has substantially decreased as compared with the time before the Ordinance became effective. Currently, uses of chrysotile mainly include asbestos friction products, gaskets, fabricated asbestos fibres and corrugated cement sheets in small quantities. The record on import and export of chrysotile for the past three years is tabulated below:

| Year | 2005 | 2006 | 2007 |
|---|---|---|---|
| Import of chrysotile and chrysotile containing materials (tonne) | 165 | 101 | 47 |
| Export of chrysotile and chrysotile containing materials (tonne) | 101 | 14 | 8 |

At present, workers who come into contact with asbestos materials are mainly those involved in demolition of old buildings.... The general distribution of private buildings in the territory is as follows:

| **Age of buildings** | **Number of buildings** |
|---|---|
| 20 to 29 years | 3,600 |
| 30 to 39 years | 3,200 |
| above 40 years | 8,800 |
| Total (above 20 years) | 15,600 |

Note: The above figures include about 900 pre-war buildings but exclude New Territories exempted houses.

The number of residents in these buildings and the exact number of buildings containing asbestos are not available. Before the 1980s, the use of asbestos containing materials in buildings was very common. Chrysotile corrugated cement sheets were used in many unauthorised canopies and rooftop structures in old buildings for heat insulation purpose. Based on past demolition records, we estimate that among those over 20 years old buildings classified by the Buildings Department as target buildings requiring demolition of unauthorised structures, about 60% of them may contain asbestos.

***Asbestos Problem on the Construction Renovation Project***

HKWHC knows that the peak period of adopting large amount of asbestos for building construction from 60's to 70's. Therefore, many old public and private buildings did contain construction materials with asbestos as illustrated in the written reply from government. The recent large scale project in construction renovation sponsored by government started at 2009, it indicates that the construction workers are facing the hazard of asbestos for providing renovation work to old private building which adopted asbestos substance. However, the enforcement of regulations on the renovation of private buildings is much relying on the compliance of legal requirement of the property owners of these private buildings.

***Asbestos Problem in other industries***

Other than the construction industry, some of the workers suffering from asbestosis and mesothelioma were used to work in ship maintenance industry. It was found that the peak period of adopting large amount of asbestos for ship building from 50's to early 80's. Therefore, ships over 20 years may contain asbestos. Although there remains only one shipyard in Hong Kong now in providing ship maintenance service, workers who had once exposed to the asbestos substance in ship maintenance may still face the risk in suffering from asbestosis and mesothelioma.

In order to enhance the public awareness of the hazard of asbestos in construction renovation project and

ship maintenance, HKWHC collaborated with the Pneumoconiosis Compensation Fund Board (PCFB) in publishing two education booklets with DVD for health promotion at 2010.

In fact, the reaction of the Government in total banning of asbestos was rather disappointed with evading attitude. The Government had no motivation at the moment to total ban and still allows Chrysotile or any substances made with it imported into or re-export in Hong Kong.

***Reform of Pneumoconiosis Compensation Ordinance***

The Pneumoconiosis Compensation Fund Board (PCFB) is established at 1980 with a role as a compensation body under the Pneumoconiosis (Compensation) Ordinance. Originally, the compensation ordinance mainly covers workers in suffering with silicosis and asbestosis. The income of PCFB comes from the levies of the construction and quarry industries in Hong Kong and the interests or profit by investing the accumulated levy income.

A gradually review and reform of the Ordinance was initiated by HKWHC together with Labor Unions. The compensation items extended from one off compensation to cover items including: 1. Compensation for death resulting from Pneumoconiosis; 2. Compensation for bereavement; 3. Monthly compensation for incapacity; 4. Compensation for incapacity prior to date of diagnosis; 5. compensation for constant attention; 6. funeral expenses; 7. medical expenses; 8. expenses for medical appliances. In view of the surplus in PCFB, it also gradually engages in the areas of rehabilitation, education and research in respect of pneumoconiosis. This became the most comprehensive central compensation fund established in Hong Kong which covers prevention, compensation, education and research on pneumoconiosis. With effect from 1 September 2008, patients could also claim for reimbursement of medical expenses on Traditional Chinese Medicine (TCM).

At 2007, HKWHC successfully lobbied the Government to support the amendment of Pneumoconiosis Compensation Ordinance by incorporating the Mesothelioma into the list of compensation. The new ordinance was named as "Pneumoconiosis and Mesothelioma (Compensation) Ordinance". The enactment of this amendment at 18 April 2008 made that patients diagnosed with Mesothelioma, as caused by inhalation of asbestos, are eligible to receive the same compensations and benefits as those patients with Silicosis and Asbestosis.

Although the enactment of the amended ordinance compensating patients with Mesothelioma, the medical cost originally reimbursed in the ordinance was only HK$200/$280 daily ceiling under the Ordinance as which was based on the charges of our public health service. However, the drug concerned for treating mesothelioma called Alimta (Premetrexed) is categorised as a self-financed item in the public hospital system (Hospital Authority) non standard drugs list. Although patients with mesothelioma can apply for subsidy from other charity fund like the Samaritan Fund, they need to pay for the cost of Alimta

(Pemetrexed) themselves if subsidy was not available from the Samaritan Fund.

As sitting in the PCFB, HKWHC advocates and lobbies the board members of PCFB to support a sponsorship to cancerous mesothelioma patients and pneumoconiotics to acquire anticancer chemotherapy medicine under the Hospital Authority non-standard drug list to treat related cancer developed out of or in connection with pneumoconiosis and mesothelioma in order to lengthen their life and enhance their quality of life. A good news is that the board members of PCFB already committed to support this proposal and preparing a letter to communicate with the Labor Department at October 2010. In view of that, we believe that it may still take one or two more years before this motion is tabled on the Legislative Council in amending the compensation ordinance.

***Conclusion***

HKWHC will continue to work hard in advocating the total ban of asbestos and substitutes for asbestos. We will also continue to advocate a better caring scheme for people in suffering from asbestosis and pneumoconiosis in Hong Kong, including the coverage of the full medical cost for treatment.

# Asbestos Issues in Indonesia

**Takehiko Murayama**

Faculty of Science and Engineering, Waseda University

**Dwi Sawung Rukmono**

Wahana Lingkungan Hidup Indonesia (Indonesia Friend of Earth)

## 1. Import of asbestos

Figure 1 shows change of import volumes of raw asbestos materials. The volume has been increasing since 1990s. According to data on countries shipping to Indonesia (Figure 2), Brazil and Canada export more than half of volume, while import volume from China has rapidly increased in a couple of years.

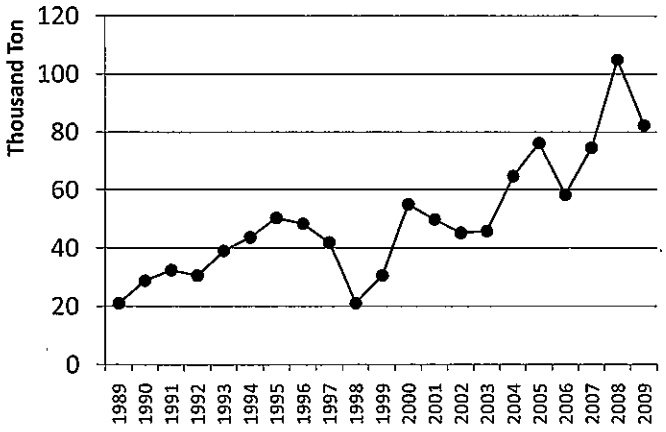



Fig.1 Import volume of raw asbestos material

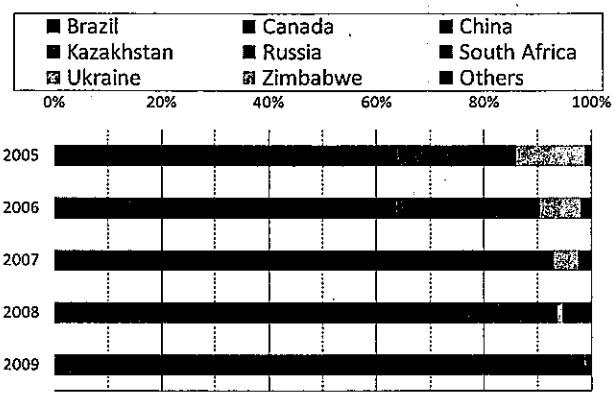



Fig. 2 Export countries to Indonesia

## 2. Condition of production

### 1) Related factories

According to materials of Occupational health and safety department of Manpower and transmigration of Indonesia government, asbestos use has substantially started in 1959, about 7 thousand workers are recently engaged in asbestos production. Other materials show that about 85 to 98 per cent of raw materials are used for asbestos roofing products, brake and insulation materials follow. However, around 56 per cent of people work for brake lings or pads, and only 30 pe r cent of workers belong to factories for roofing materials

### 2) Alternatives

We conducted a survey on alternatives for asbestos products in March of 2010. It would be relatively easy to find alternatives for asbestos products. According to interview with head of a factory which stopped using asbestos in 2007, change to alternatives made volume of the sales decreased to one-twentieth. One of major factors would be cost of a gap between asbestos and other alternatives. The head said that Asbestos products were one-tenth cheaper than alternatives. While industries based foreign capitals

gradually changed to alternatives, domestic capitals still operate asbestos-related factories in traditional manner. One of key issues would be the transition of products use to alternatives.

**3. Occupational health and environmental issue**

**1) Occupational health**

According to Manpower and transmigration of Indonesia government, lung cancer and mesothelioma were observed in hospitals. However, it is said no case shows evidences on asbestos exposures. They also do not observe any other asbestos-related diseases including asbestosis. Citizen groups conducted a medical check with foreign countries experts for workers, and they found several workers who suffered from asbestosis.

**2) Environmental pollution**

There is no reports on environmental condition related to asbestos pollution. Korean group headed by Prof. Kang of Busan University organized a survey project on environmental condition around an asbestos production factory with Japanese and Indonesian groups. The result shows asbestos concentration attenuated according as the distance from the factory. Another survey by Indonesian groups found several cases in which local houses or schools are located near to asbestos factories. They also reported that a factory was located next to elementary school.

**4. Factory transfer from foreign countries**

Some factories would be transferred from foreign countries. In this case, a part of function of a factory located in Nara of Japan was transferred to Busan of Korea in early 1970s, and they were also transferred to Indonesia in 1990. We could a survey on the condition of workplace environment in that factory with Korean groups, and we found that workplaces were almost the same as those in Busan factory. There were several ravels written in hangul characters. A mask workers were wearing in the factory was produced in 1990, it should be clarified whether they always used masks.

**5. Other related issues**

Natural disasters including earthquakes and tsunami are often occurred in Indonesia. Local citizen groups are worry about asbestos pollution induced by destructions, demolitions and constructions. After disasters, asbestos related products still tend to be used for new buildings, and we need to consider several occasions people are exposed.

**6. Activities of citizen groups**

Since 2007, citizen groups are actively dealing with asbestos issues. The second annual meeting of Asian Asbestos Ban Network (A-BAN) was held in Bandung of Indonesia in October 2010, and domestic network on asbestos ban campaign (Ina-BAN) has been established.

# The Asbestos Use and Concentrated Injury in Japan

**Shinjiro MINAMI**
Postdoctoral Fellow at Ritsumeikan Global Innovation Research Organization
Ritsumeikan University

## 1. Outbreak and Stock of Asbestos Disaster in Japan

Japanese asbestos disasters in the news in recent years are an outcome of the use of asbestos by industrial society for many decades and the accumulations of this material in the environment and in the bodies of victims. Asbestos contamination is an enormously serious condition with life-threatening consequences. Every stage of asbestos use within the economy, from production and distribution to utilization and disposal, entails a risk of exposure and subsequent harm.

This paper examines the asbestos use process from production to consumption as economical factor of asbestos disaster escalation and stock. It clarifies the history of asbestos use in Japan from the side view of economic growth and industrial structure, and takes notice of Osaka Sennan District as the example of asbestos concentrated injury in Japanese asbestos history.

## 2. Large Amount of Asbestos Use in Japan

The asbestos industry in Japan was started by the end of the nineteenth century. The total asbestos volume of imports in Japan is estimated at about 10 million tons. Asbestos was used a large amount between 1950s and 1990s. The background of asbestos use is high economic growth with heavy industrialization and urbanization. Because asbestos textile goods was related to heavy industry and asbestos cement goods (construction materials) was related to radical urbanization.

### (1) Heavy Industrialization and Asbestos

Asbestos textile goods such as Insulation, fireproof, soundproof, packing, friction, and electrolyze cloth are important and suitable parts for heavy industry. Japanese industrialization was developed rapidly after World War II and heavy industry had demanded a large amount of asbestos textile goods. Table 1 indicate total shipment amount of asbestos textile goods between 1960 and 2000.

Total amount for 41 years is 2.59 million tons. Main asbestos consumer industries are automobile industry (29.43%), machinery (11.47%), chemical industry (others) (4.72%), steel industry (4.67%), electricity (3.53%), ocean transportation (= shipbuilding) (2.74%), and oil industry (2.33%). These 7 sectors accounted for 58.89% and all belong to heavy industry.

Table 1 Total shipment amount of asbestos textile goods at 1960 – 2000 in Japan.

| sector of demand for asbestos textile goods | shipment amount (ton) | % |
|---|---|---|
| export | 72,846 | 2.81 |
| chemical industory (manure) | 10,343 | 0.40 |
| chemical industory (others) | 122,449 | 4.72 |
| energy (electricity) | 91,535 | 3.53 |
| energy (gas) | 11,283 | 0.44 |
| mine (coal) | 3,074 | 0.12 |
| mine (others) | 5,500 | 0.21 |
| oil industory | 60,285 | 2.33 |
| land transportation | 16,382 | 0.64 |
| ocean transportation | 71,091 | 2.74 |
| automobile industory | 762,891 | 29.43 |
| machinery | 297,389 | 11.47 |
| food industry | 3,957 | 0.15 |
| textile industory | 14,625 | 0.56 |
| steel industory | 121,124 | 4.67 |
| nonferrous metals industory | 23,032 | 0.89 |
| others | 904,213 | 34.88 |
| total | 2,592,019 | 100.00 |

*round off to whole numbers

Source: Japam Asbestos Goods Industry Association, *Industry News*, each numbers (in Japanese).

Table.2 Shipment amount of asbestos cement goods at 1970 – 1995 in Japan

unit: 1,000 pcs

| year | Asbestos cement board (for residence) | Corrugated Asbestos Slate (for factory or office) |
|---|---|---|
| 1970 | 27,919 | 74,972 |
| 1975 | 41,454 | 46,576 |
| 1980 | 34,340 | 56,494 |
| 1985 | 61,788 | 34,357 |
| 1990 | 76,378 | 31,106 |
| 1995 | 72,302 | 19,139 |

Source: Research and Statistics Department Minister's Secretariat Ministry of International Trade and Industry, *Census of Manufactures, Report by Commodities,* eace years

**(2) Urbanization and Asbestos**

Rapidly urbanization occurred with high economic growth in Japan after WWII. Population drain to city was advanced by transition of industrial structure (high-tech, computerization, service industrialization). It demanded for a large amount and suitable materials for radical urbanization. Asbestos construction materials is cheapness with fireproof and durability, was used for building and water-supply.

As the Table.2, a trend of asbestos construction materials consumption was shifted from corrugated

asbestos slate (specific material for factory or office) to asbestos cement board (general material for residence), the consumption peak of asbestos board was 1990s.

Water-supply extension in Japan was promoted especially at 1950s – 1970s. Asbestos water pipe was cheaper than a cast iron pipe and suitable for advance demand of water-supply construction. According to Japan Water Works Association, total inspection amount at 1942 – 1986 fiscal years is 2,054,300 tons and the largest amount year is 1965 (129,748 tons)[1].

**(3)Link to Asbestos Injury**

Asbestos production and consumption connects directly with asbestos injury. The notable asbestos injuries in Japan are three cases, Osaka Sennan District (concentration area of asbestos textile factories), construction workers occupational diseases at Tokyo metropolitan areas, and Kubota Kanzaki factory in Amagasaki city (water pipe factory). This paper takes notice of Sennan Case in next paragraph.

## 3. Sennan Prefecture as a Center of the Japanese Asbestos Industry

**(1)History of Sennan Asbestos Industry**

Osaka Prefecture in modern times developed into an industrial metropolis with many factories of every scale. The asbestos industry was part of that trend and concentrated its operations more in Osaka than in any other prefecture nationwide. Especially, Sennan Prefecture consistently accounted for a high share of total shipments of asbestos yarn and fabric.

Commercial production and sales of asbestos products began around 1890 in Japan. The 1894 establishment of Nippon Asbestos Co. Ltd., (the leading company of asbestos industry in Japan, changing its name to NICHIAS at 1981) forerunner Kuei Shoten -- a joint venture between Seiki Sakaeya and Mitsugi Kubo -- was in Osaka. In 1907, Seiki Sakaeya built an asbestos textile factory in Shindachi Village, Senboku County (today known as Sennan City of Osaka Prefecture), which the following year established itself as the first successful asbestos textile business operation in Japan. In 1912 Sakaeya took over the facility's operations and went independent after a transfer of the business from Japan Asbestos, establishing Sakaeya Asbestos Spinning & Weaving Co., Ltd. ("Sakaeya Asbestos" hereafter). With Sakaeya Asbestos at their core, many asbestos textile operations set up and concentrated in the Sennan district.

Based on a survey by the Environmental Management Center (in the Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government) and data collected from assorted documentation, phone books, and other records, as many as 330 asbestos-related factories were in operation within Osaka Prefecture at one time; of that total, around 100 each were located in Osaka City and the Sennan district (the cities of Sennan and Hannan today), respectively, with the rest located in other cities and towns. It is assumed, moreover, that not all factories were identified through these assessments. Also, according to Kazuyoshi Yuoka, the spokesman for the Sennan Asbestos Victims Organization, during the boom years of the 1960s and 1970s the Sennan district had around 60 companies with integrated asbestos processing factories (handling everything from crude asbestos processing to the manufacture of final products on-site) but if smaller-scale

subcontractors and cottage-industry-type businesses are also included, the total comes to at least 200.

**(2)Trends Relating to Asbestos-Induced Health Problems in Sennan Prefecture**

In Japan, the earliest investigation into health issues in asbestos factories was a Ministry of Home Affairs study conducted from 1937 to 1940, prior to World War II. With the Sennan district as its primary focus, this study comprised health examinations for a combined total of 650 (319 male and 331 female) employees engaged at 11 factories in the Sennan district, two factories in Osaka City, and one factory in Nara Prefecture. In particular, x-ray examinations were performed on a total of 351 employees, including 206 employees with work histories of three years or more and 45 with work histories of less than three years. The x-ray findings disclosed a pulmonary asbestosis incidence rate of 17.2 percent in the male subjects and 7.6 percent in the female subjects, for a total rate of 12.4 percent. Further, the disease rate rose in parallel with worker length of service, reaching 83.3 percent in those with work histories of 15-20 years and 100 percent in those with work histories of more than 20 years (Table.3).

Table.3 Pulmonary Asbestosis Incidence, by Length of Service (1936–1940 a Ministry of Home Affairs Study)

| Length of Service | Under 3 years | 3–5 years | 5–10 years | 10–15 years | 15–20 years | Over 20 years |
|---|---|---|---|---|---|---|
| Incidence | 1.90% | 20.80% | 25.50% | 60.00% | 83.30% | 100.00% |

Data source: Hyogo College of Medicine, Internal Medicine Course Three. *Trends in Japanese Asbestosis Research*. 1981, p. 6.

Table.4 Findings of Postwar Health Examinations for Asbestosis in Osaka Prefecture

| | Survey Overview | No. of Workers Examined | Workers with Symptoms | Share (%) |
|---|---|---|---|---|
| 1957 | 1955 Ministry of Labor and Welfare research study | 814(All factories in the Sennan district plus two in Osaka City) | 88 | 10.8 |
| 1960 | Asbestosis exams following enactment of Pneumoconiosis Act | 633 | 48 | 7.6 |
| 1963 | | 240 | 27 | 11.3 |
| 1966 | | 260 | 29 | 11.1 |
| 1970 | | 231 | 42 | 18.2 |

Data source: Sera Yoshizumi, "Asbestosis in Osaka." Study Group on the Record of Worker Health in Osaka. *The Record of Worker Health in Osaka*. 1983. P. 90.

Table.4 lists the findings of several postwar examination-based studies for Asbestosis. Trends in the incidence of asbestos-related disease had not changed during this interim. These findings demonstrated that hardly any dust prevention measures had actually been put into effect. It is estimated that the Sennan district had around 1,000 asbestos industry workers in 1972. Of that total, at least 10 percent would be expected to contract asbestosis, with an unknown number eventually developing mesothelioma or lung cancer.

In Japan, companies were obligated to implement measures against asbestos dust under provisions of the Pneumoconiosis Act of 1960. However, because dust control equipment (dust collector) and supplies (protective masks, etc.) were considered to be disaster prevention-related expenses, many companies typically sought to economize on spending for such items in an effort to protect their market competitiveness (which would otherwise suffer proportionally if such expenditures were

factored into prices for their merchandise). Above all, because small and medium-scale factories typically had poor cash-flow and their production costs and product prices were dictated by their clientele, they often were unable to come up with the funding required for dust prevention measures.

**(3) The Present of Asbestos Damage in Sennan Prefecture**

In response to the growing awareness of the hazards of asbestos and tighter regulations, members of Sennan's asbestos industry followed the national trend and either changed to other business lines or went out of business entirely as the amounts of utilized asbestos continued to dwindle. By 2007, all asbestos factories in the district had disappeared. Asbestos-linked illnesses among many former asbestos factory workers and local residents are the only remaining legacy of this industry and court cases have been launched to have the national government accept responsibility and pay damage compensation. The first trial judicial decision of this case recognized the most part of plaintiffs' complaint at May 2010. But the defendant (the national government) made an application for intermediate appeal and it is pending in court.

---

[1] Japan Water Works Association, *Water-supply and Asbestos,* 1989, p. 13.

# Asbestos Problems in Asian Countries -Compared to Japanese Experiences-

**Kenichi Miyamoto**
Professor Emeritus, Osaka City University
Guest professor, Ritsumeikan University, Japan

## 1. The Asian-typed modernization and overlapping social disaster

Since the begging of the 21th century, about 50 countries has banned on the use of asbestos. Except Canada and Russia, the rest of developed (industrial) countries prohibit from using asbestos in principle. On the other hand, Asian countries without Japan and South Korea and Latin American countries, such as China, Thailand, India, and Brazil, drastically increase to use asbestos. As shown in Table 1, China consumed 30 % of total asbestos in the world and India also consumed 15 % of those. It tells Asian countries consume the half of all asbestos in the world. Asia should be the worst disaster region of the world if this situation is ignored in future. Thus, the Ritsumeikan University study group has started to investigate the situation of not only United States and European countries but also Asian countries. Through the study, asbestos problems in Asian countries do not fully open the data without Japan, South Korea and Taiwan, so it is difficult to do comparative study of Asian countries. So, today I will talk about the asbestos' situation and problems in Asian countries from perspective of Japanese experiences.

Table 1 Worldwide Asbestos Supply and Consumption Trends from 1930 to 2009
(the amount of production + that of import) – that of export unit: tons

| Coutry/ Year | 1930 | 1960 | 1970 | 1980 | 1990 | 2000 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| China | 315 | 81,288 | 172,737 | 150,000 | 185,748 | 382,315 | 491,954 | 537,000 | 515,000 | 541,000 | 626,000 |
| India | 1,847 | 23,652 | 49,792 | 96,892 | 118,964 | 145,030 | 192,033 | 190,000 | 255,000 | 240,000 | 302,000 |
| Japan | 11,193 | 92,483 | 319,473 | 398,877 | 292,701 | 85,440 | 23,437 | 8,180 | -31 | -875 | 58 |
| South Korea | — | 631 | 36,664 | 46,641 | 76,083 | 30,124 | 23,799 | 14,600 | 6,480 | 4,700 | 1,100 |
| Thailand | — | 6,433 | 21,272 | 58,756 | 116,652 | 109,600 | 132,983 | 166,000 | 176,000 | 141,000 | 86,500 |
| The US | 192,454 | 643,462 | 668,129 | 358,708 | 32,456 | 1,134 | 4,634 | 1,870 | 576 | -1,610 | 916 |
| England | 23,217 | 163,019 | 149,895 | 93,526 | 15,731 | 268 | 22 | 2,150 | -1 | | 187 |
| France | — | 83,385 | 152,357 | 125,549 | 63,571 | — | — | -23 | -374 | 40 | 169 |
| Italy | 6,942 | 73,322 | 132,358 | 180,529 | 62,407 | 40 | — | - | -20 | -5 | -29 |
| Russia | 38,332 | 453,384 | 680,589 | 1,470,000 | 2,151,800 | 449,239 | 429,020 | 321,000 | 315,000 | 293,000 | 280,000 |
| Brazil | 136 | 26,906 | 37,710 | 195,202 | 163,238 | 172,560 | 78,403 | 66,900 | 139,000 | 134,000 | 93,800 |
| Total | 388,541 | 2,178,681 | 3,543,889 | 4,728,619 | 3,963,873 | 2,035,150 | 2,108,943 | 2,100,000 | 2,260,000 | 1,990,000 | 2,080,000 |

Source: U.S., Geological Survey, *Worldwide Asbestos Supply and Consumption Trends from 1900 to 2003.* U.S.Geological Survey., *Worldwide Asbestos Consumption from 2003 through 2007.*

First of all, I would like to begin to talk about asbestos situation and problems in a part of East Asian countries and South-East Asian countries where there are different economic and political systems. That of Japan, South Korea and Taiwan is Capitalism. That of China and Vietnam is socialism of one-party rule, but recently shifts to global capitalist market so we can say that they has nation-state capitalist system. Thailand also begins to enter global capitalist economy but it is ruled by imperial reign. Each country has each religion, life-style, and culture, so we should not discuss all at the same level because there will easily lead to mistakes. While, different from United States and Europe, these countries have a common point like Asian-typed modernization. United States and Europe took 300 years to modernize after civil revolution and industrial revolution, while Japan did only for 100 years. As soon as after World War II when other Asian countries were released from colony of United States, European countries, and Japan, they started to modernize their countries, that is, they are developing their economy with industrialization and urbanization at the same time. Such an Asian-typed modernization made their economic power grow rapidly, but they face the typical disaster which developed countries had experienced in the period of industrial revolution for a long term and the modern disaster at the same time for a short period. Therefore, the factors are so complicated that they cannot take measures against asbestos easily.

Such an Asian-typed modernization was started from Japan, and in the process of the modernization, pollution and workers' disaster explosively occurred. Concurrently with United States, the Law and administrative organization (institution) for environmental protection was established by public opinion and movement against pollution, because democracy, fundamental human rights, civil freedom were guaranteed through the reform after the war although they were imperfect. Also, pollution problems were solved in trail. In the 1980s, new governments of South Korea and Taiwan overthrew their military-ruled administrations and then introduced democracy. After that, their environmental policies have advanced due to big wave of environmental protection movement. However, it cannot be said that other Asian countries guarantee democracy and the freedom of civil society. Such various political, economical, and social systems reflect on the characteristics of asbestos' problems.[i]

## 2. The asbestos problems in East Asian countries

Table 2 shows the trend of asbestos consumption in Asian countries after year 2000. The "Kubota Shock" accident which took place in Japan 2005 gave impact on South Korea and Taiwan. These countries started to regulate using asbestos by the pressure of public opinion. The South Korea government has totally banned on the use of asbestos since 2009. The Taiwan government regulates the limited amount of using asbestos and plans to prohibit from using asbestos totally within next five years. The rest of countries, however, use mainly chrysotile and no plan to ban on it, so it is continue to expand the use of chrysotile (asbestos) in Asia.

Table 2 The Trend of Asbestos' Consumption in Asian Countries (Unit:tons)

| Country | 2000年 | 2001年 | 2002年 | 2003年 | 2004年 | 2005年 | 2006年 | 2007年 | total |
|---|---|---|---|---|---|---|---|---|---|
| China | 382,315 | 394,324 | 378,457 | 492,000 | 537,000 | 515,000 | 541,000 | 626,000 | 3,866,096 |
| India | 145,030 | 150,161 | 168,292 | 192,000 | 190,000 | 255,000 | 240,000 | 302,000 | 1,642,483 |
| Thailand | 109,600 | 103,320 | 109,684 | 133,000 | 166,000 | 176,000 | 141,000 | 86,500 | 1,025,104 |
| Vietnam | 44,150 | 24,905 | 27,885 | 39,400 | 58,300 | 103,000 | 61,200 | 64,400 | 947,940 |
| Indonesia | 42,877 | 38,562 | 34,618 | 32,300 | 51,000 | 23,300 | 36,300 | 46,200 | 305,157 |
| Japan | 85,440 | 78,247 | 44,521 | 23,400 | 8,180 | -31 | -875 | 58 | 238,940 |
| South Korea | 30,124 | 25,044 | 18,035 | 23,800 | 14,600 | 6,480 | 4,700 | 1,100 | 123,883 |
| Malaysia | 17,711 | 6,166 | 10,607 | 13,400 | 8,350 | -11,800 | 10,300 | 9,390 | 64,124 |
| Philippine | 2,631 | 3,023 | 2,738 | 2,450 | 3,580 | 1,490 | 2,570 | 2,180 | 20,662 |
| Bangladesh | 1,445 | 1,266 | 1,467 | 2,800 | 2,000 | 2,610 | 2,610 | 2,740 | 16,938 |
| North Korea | 848 | 750 | 893 | 1,230 | 1,880 | 1,710 | 2,240 | 2,060 | 11,611 |
| Hong Kong | 1,135 | 3,400 | 970 | 2 | 5,310 | (blank) | 29 | 1 | 10,847 |
| Singapore | 2,990 | 415 | less than 0.5t | 268 | 3 | -3,180 | 1,400 | 40 | 1,936 |

Source: U.S. Geological Survey, *Worldwide Asbestos Supply and Consumption Trends from 1900 through 2003,* 2006.
U.S. Geological Survey, *World Asbestos Consumption From 2003 through 2007,* 2009.

In South Korea, the raw materials have been imported and processed since after the 1970s although there were 16 asbestos mines. In fiscal year 1993, there are 1,476 employees and 118 factories related asbestos. 82% of total asbestos was used for building materials, 11% of that was for frictional materials, 5% of that was for textiles, and 2% was for others. 90% of the total consumption of asbestos was chrysotile because crocidolite has been prohibited from importing since 1981. One of main factories to use asbestos is Japanese company, Nichiasu's subsidiary company, Diichi Kagaku (the first chemistry). It tells that Japan exports pollution to other countries. After the regulation was strict in the second half of the 1990s, the factory moved to Indonesia. The whole picture of the damage by asbestos is not identified yet. Although the South Korean EPA announced that 334 people were died of mesothelioma and 60people was acknowledged victim as workers' accident, it is expected that the number of them would amount to around 500 people. In South Korea, there is Compensation Law for workers' accident disaster, under which people who work at asbestos related industries for more than 5 years can take preventive diagnosis (from a doctor). Environmental disaster of inhabitants around factories becomes a serious problem and then the Relief Law for asbestos' victim similar to Japanese one was established in 2010. There are a few trails but still quite small number. Asbestos was used for 1/3 of total buildings in South Korea, so when those buildings are pulled down, to prevent from exposing to asbestos would be a critical issue in future.[ii]

In Taiwan, asbestos particles from factories were very serious problem. Shipbreaking also caused the damage by asbestos. In 1989, the government classified asbestos into a specified material

in order to regulate. In July, 2009, the government prohibit from using asbestos except for educational study, material of architectural roof, filling materials for crack, and brake-linings. Until the 1980s, Japanese companies, such as Nichiasu, provided their capital partly for those factories using asbestos and then now they withdraw from Taiwan. Today, the government permits 35 companies to use asbestos, of which 20 companies are in operation. The amount of discharging asbestos particles is set to 1 f/cc under the regulation, which is so high that it will be revised to set 0.15 f/cc in near future. As a result of that the regulation becomes strictly, many factories are moving to China and South East Asian countries. The government reported that the number of Mesothelioma was 387 from 1979 to 2005, of which 12 cases were covered from compensation for industrial accidents. This compensation cannot be accepted after retirement. So, in some cases, people cannot receive the compensation, because the damage of asbestos is usually appeared spending for a long time after exposure. In the case of that people can receive the compensation, there comes up to a problem that victims receive compensation from which deduct their retirement allowance. There are no reports about environmental disaster and also no Relief Law in Taiwan.[iii]

In China, there are 50 chrysotile mines and the total amount of those deposit is 90 million (90,610,000) tons. 90% of these areas is located in living space of western minorities. In fiscal year 2008, these mines produced 410 thousand tons, 220 thousand tons were imported, and in total 630 thousand tons were consumed. China is the most amount consumption of asbestos in the world. In 2002, Chinese government prohibited from using crocidolite. The half of total chrysotile is used for asbestos' cement, 20 % is for friction materials, 10% is for insulation and lagging materials. Although the government prohibited from using chrysotile for the automobile brake-linings in 2002 due to international relations, brake-linings using chrysotile still can be seen. The government announces that chrysotile will be safe when its management is perfect. The exposure level of asbestos at work place is set to 1.5/cc in new project and 2.5/cc in the present project. Following data is little bit old, but I would like to tell it here. In fiscal year 1996, the number of workers at asbestos' mines was 24 thousand people, and workers at asbestos related places were 1 million people. According to Chinese Center for Disease Control and Prevention, more than 8,000 people (1% of total pneumoconiosis) suffered from pulmonary asbestosis and were officially acknowledged victim of workers' accident, 1,000 people (12 % of total pneumoconiosis) already died, 15 % of workers using asbestos has pleural thickening, and 50% of that had pulmonary asbestosis. Even though there are suffers from mesothelioma in some parts, any doctors do not diagnose their illness as an occupational disease. Moreover, there is no report of environmental disaster. Chinese government expresses its opinion that there is no anxious about exposing to asbestos when buildings are pulled down because in the country few spraying asbestos is used. Observing production becomes strictly in China, but it cannot cover all, because more than 90% of all companies are small and medium-sized enterprises, and workers from rural area, where the regulation does not function

enough, reaches to 200 million people. The extreme data shows that the density level of the asbestos at mines is 6f/cc and that at its factory is 5f/cc, very high density level. Department of Occupational Safety and Health Supervision explained that 276 factories in a city were investigated in 2005 and only 20 factories of those followed the regulations. The reason why the government does not prohibit from using asbestos is that a number of unemployment will be created if the production stops, especially in Western area of China where there are many mines, it would damage its regional economy and finance seriously and makes the price of alternative production high as many as 15 to 40 times. As a result, its economic losses would be big. However, huge damage by not only workers' accident but only environmental disaster would appear if the investigation goes forward in future. Today, there is compensation for workers' accident but there are no Relief Law and no trial.[iv]

In the case of Indonesia, the government is behind to take measures for asbestos although the damage seems to be caused by using it. As mentioned before, the government understands that it is difficult to stop using asbestos due to the creation of unemployment.

### 3. The asbestos' disaster and problems in Japan

In June 2005, three mesothelioma-afflicted residents of the community around Kubota Corporation's Amagasaki Plant with support group started to negotiate (bargain) with Kubota about their compensation. This unveiled the damage caused by asbestos over more than 100 years. The Kubota has started to give a relief treated as the compensation for industrial disease (25 million to 46 million yen for compensation) to sufferers from pollution (environmental pollution). In February, 2006, the Japanese government also constituted the Asbestos' Disaster Relief Act and began to relief for the victim who was damaged by environmental pollution and who did not apply for compensation for industrial disease until now.

#### (1) Serious damage

After the Japanese government and enterprises dealt with the damage by asbestos, it is proved that the serious damage has already started to appear although it is hard to grasp a whole picture of the damage because of no epidemiology investigation, which is the fundamental research of damage. As shown in Table 3, the number of the officially acknowledged victim of asbestos was 203 until 1994 and also counted only 654 for next 10 years (from 1995 to 2004). In 2005 when "Kubota Shock" occurred, however, 715 people were acknowledged as the victim of workers' accidents, more than 10 times as many as so far. In 2006, the number amounted to 1,784 people, 30 times as many. From 2005 to 2009, the number of the acknowledged victims of workers' accident amounted to 5,582 (2,484 people for lung cancer and 3,098 people for mesothelioma), that of victim covered by seaman's insurance reached 59, and that of patients covered by workers' accident got to 5,641. From 2006 to 2009, the number of additional acknowledged victims by new law came up to

6,205 (975 people for lung cancer, 5,230 for mesothelioma). So far, the total number of acknowledged victim by asbestos damage have reached to 1.2 thousand (11,846) people.

Table 3
Japanese Trends of the compensation and relief for Mesothlioma and pulmonary asbestosis cancer

| | ~1994 | ~2004 | 2005 | 2006 | 2007 | 2008 | 2009 | total |
|---|---|---|---|---|---|---|---|---|
| The estimated number of the dead | 11,055 | 21,039 | 2,733 | 3,150 | 3,204 | 3,510 | 3,468 | 48,159 |
| Insurance for workers' accident | 203 | 653 | 715 | 1,784 | 1,002 | 1,062 | 1,019 | 6,438 |
| Insurance for seamen | | 1 | 6 | 23 | 12 | 9 | 9 | 60 |
| New Relief Law for the status of limitation | | | | 842 | 95 | 112 | 95 | 1,144 |
| New Relief Law (for the dead) | | | | 1,477 | 292 | 463 | 737 | 2,969 |
| New Relief Law (for alive) | | | | 632 | 453 | 528 | 479 | 479 |
| Total of acknowledged victims | 203 | 654 | 721 | 4,758 | 1,854 | 2,174 | 2,339 | 12,703 |

Source: "Information of labor safety center" 2009, vol. January/February, p74

The number of the acknowledged sufferers from lung cancer by pulmonary asbestosis is less than other countries, but there are 2,000 to 3,000 deceased people per year. In the case of Kubota, until March, 2010, the number of the victim caused by asbestos was 391, and the number of the dead was 334 (144 employees who already died, 26 victims under medical treatment, 190 inhabitants living factory who already died, and 31 cases who recuperate). The Kubota paid compensation treated as same as industrial accidents' case to 194 victims.

The Japanese government has prohibited from using asbestos since 2008, but the victim who had been exposed to asbestos from the 1950s to the 1970s comes to appear now. It can be said that the damage will exist through this century as long as there is disaster by destruction of buildings and earthquake occurs.

**(2) All the enterprises as wrongdoers and sufferers across all regions**

More than 80% of asbestos was used for building materials, the rest of that was used for 3,000 kinds of goods such as automobiles (cars), the brake-linings of locomotives, warships and vessels, energy institutions such as an electric power plant, and cosmetics. The damage is caused in the process of all economic activities, production, distribution, consumption, and disposition.

According to the governmental announcement, at the period of December, 2009, 4,189 enterprises notified that they had the victim from industrial disease by asbestos, of which 2,261 engaged in the manufacturing industry and remaining 1,928 engaged in a wide range from trade, service, and stage making industries.

The victim by asbestos exists ranging over Osaka, Hyogo, Tokyo, Kanagawa and

nationwide.

**(3) The Mixed (Complex) Stock Disaster**

The damage takes 15 to 50 years to develop a fatal disease, such as mesothelioma, lung cancer, and pulmonary asbestosis after one is exposed to asbestos. Such types of pollution is different from so far pollution that contaminants resulting from the process of economic activities cause pollution for a short period. The types of pollution caused by asbestos is not "Flow Pollution" that pollutant can disappear when a company stops to discharge or changes the production system but "Mixed (complex) Stock Pollution" that pollutant is accumulated in human body, goods, and waste for a long term and causes pollution and workers' disease.

So far asbestos is called "magic material," indispensable for any goods because of its disposition such as heat-resistance and fireproof materials. Although the Japanese government totally prohibited from using asbestos in 2006, there has been no social economic difficulties. After all, alternative materials are no problems to do economic activities. Thus, the reason why a large amount of asbestos had been used is not indispensable but cheaper than alternatives because these were produced by low-paid workers.

Due to the characteristic of "Mixed (complex) Stock Pollution" that it takes long time to appear the damage after exposing, ones that cause pollution should pay compensation following principles of PPP and EPR when the government or companies paid any compensation and took relief measures. However, there is a different problem of workers' disease and pollution from so far ones. Like the case of Sen-nan region in Osaka, almost all enterprises gave up their business, and had no money and even no materials of evidence. In this case, no matter how companies' responsibility should be accused, who takes responsibility?

In the case of United States, companies, such as automobile, vessel, power plant, and trading companies, that products are made of a part of asbestos, are accused. However, the principle of EPR has not taken root in Japan, so we have to pursue the responsibility of the Japanese government.

**(4) The responsibility of the government**

The Japanese government disclosed the damage of pulmonary caused by asbestos in Sen-nan region in 1937 when it was before the war. After the war, the government investigated the condition of the damage by asbestos. At least, there were evidences enough to implement basic measures in the 1970s. While, the measure for asbestos' damage was far behind even though it advanced to taking other pollution measures such as the Pollution's Health Damage Relief Act implemented at that time. In the 1980s, the Scandinavian countries already started to prohibit from using asbestos and disclosed its environmental damage inside and outside the country. Nevertheless,

the Japanese Environmental Agency did not investigate the condition of the health damage of residents living around factories. The Agency just measured the amount of asbestos outside at a particular area and neglected to take its prevention measures. Like called PPM doctrine, the Agency and local governments depend on observational data than human health. This is fundamental failure of them.

It was obvious that the Japanese government did not take the prevention measures for asbestos' damage when Hanshin-Awaji Earthquake occurred in 1995. Actually, the government finally began to take measures for asbestos after more than 1 month from the earthquake. It just observed and measured the amount of asbestos in the air at parts of regions. According to the observational data, there were some polluted areas where the pollution level was over the standard of the regulation. However, there were no measures and implementations. So, the government did not issue a warning for construction workers to take safe way to remove asbestos when they engaged in pulling down building and for citizens to wear masks when they restored their town. Due to this, in 2008, there came to appear mesothelioma patients who engaged in the dismantling construction work. There is a possibility of appearing other patients in future.[v]

Through "Trial of Sen-nan Asbestos," Osaka local court decided that the Japanese government was to be blame. Moreover, the trial on construction workers in metropolitan area charges with not only enterprises' responsibility for construction but also their collective responsibility for using and distributing asbestos. These trials will make clear that the legal responsibility would lie with the government and enterprises.

## 4. Coming measures for asbestos –international comparative study-

**I would like to suggest some measures for asbestos matters in future.**

### (1) Epidemiologic investigation

We should do the epidemiology research about the workers engaging in asbestos-related factories and residents around there.

The reason why Minamata disease cannot be solved yet is that the investigation of residents' health around the polluted sea has never been done, as well as Asbestos' case. So, in order to take measures against asbestos hereafter, such investigation must be done at places where there are environmental sufferer living around asbestos-using factories, especially like Kubota and Nichias (Nihon Asbestos). Also, workers engaging in asbestos-using factories and residents living around there should be registered and their long-term diagnosis should be done. It is very hard to collect such data over half century, but we have to do that, because the problems will be not solved unless we do the epidemiologic investigation like the case of Minamata disease.

Enterprises which used asbestos have to disclose details why it started to use asbestos and

the history of the production process. In order to make a whole picture clear, movement (campaign) for investigating the victim by asbestos need to be started. The problems are not apparent because the victim tend to be discriminated in a living area and society and are abandoned from relief. I expect that such a movement will be promoted by support groups helping them.

**(2) The legal responsibility of enterprises and the government**

A trial should make clear the regal responsibility of enterprises and the government, which should be referred under law.

In Japan and South Korea, enterprises and the government just give relief as their social responsibility at present, so this is not compensation. Like France, the government should make clear and recognize that legal responsibility rests with itself and then it should compensate and relief for sufferers from asbestos.

**(3) The revision of the Asbestos Disaster Relief Act**

Japanese Asbestos Disaster Relief Act has been defective, because it was established in haste. The amount of compensation prescribed by Asbestos Relief Law is one tenth as many as that of compensation for workers' accident. The responsibility of pollution (environmental damage) must be severer than that of workers' accident, so the amount of compensation paid by pollution's causers should be more than workers' disease case. In France, the number of designed victim as pulmonary asbestosis cancer is more than that of mesothelioma. In Japan, on the other hands, that of pulmonary asbestosis cancer is very few because the factor of the disease is diagnosed as smoking (cigarette). Even though there are few medical specialists in this field in Japan, we should identify the illness related to factor caused by asbestos such pulmonary asbestosis cancer. In addition, I suppose that the Relief Act in South Korea could have the same problems as Japan because it is very similar.

**(4) What the relief institution of Asian countries should be**

Internationally, there are two relief institutions, one is relief by trial like United States, and the other is by the asbestos' victim foundation (Fond d'indemnisation de l'amiante (FIVA)) like France.

Table 4 The average of compensation by trails in United States. (Unit:US$)

| | |
|---|---|
| Asbestosis (slight) | 100,000 |
| (severe) | 400,000 |
| Lung cancer (smoker) | 600,000 |
| (ex-smoker) | 975,000 |
| (non-smoker) | 1,100,000 |
| Mesothelioma | 1,100,000 |

Source: Antonio Sato, Gael Salazar eds, "Asbestos"(2009,N.Y.)

In United States' case, the government does not have a conception that the government should take its legal responsibility and paid compensation for victims. People also have a conception that one should take self-responsibility for his/her action or behavior, so the victim claims for their damages in trial. All the companies which produce goods made parts of asbestos could be the accused. According to the Land Research Institution's report 2002, there were 60 thousands trials, 600 thousands accusers, 6,000 accused enterprises raging from 83 different types of industries, and US$54 billion paid as compensation. As shown in Table 4, the amount of compensation for mesothelioma was $ 1.1 million. The settlement by trial seems to be appropriate in the case of following market principle, but there is a problem that victims can get only 40% to 50% of their received compensation, because the rest of that is paid for trial costs to lawyers and the return of public temporal payment for the trial. This case remains a problem. As a result, people come to claim official relief measures recently.[vi]

In French case, the purpose of FIVA established in 2000 is to relief for all sufferers from asbestos. 90% of its financial resources comes from Social Security Foundation and the rest of that comes from the French government, that is, FIVA is based on social insurance paid by labor and management. This does not act on PPP principle, but all companies and workers pay widely and lightly for "social risks." This institution sets the wide-range target for sufferers from asbestos to receive compensation, as seen in Table 5. For example, the amount of compensation for mesothelioma is 11.5 thousand euro. So far the number of total applicants has reached 4.7 thousand and also that of the acknowledged cases are more that of lung cancer than that of mesothelioma. Although FIVA is very great as an official institution, 1,000 cases come to court to accuse companies as wrongdoers. It is because the amount of compensation is very small and also victims tend to go to trial in order to make clear the legal responsibility of enterprises. In the case of administrative relief, the legal responsibilities of enterprises as wrongdoer usually are not accused.[vii]

Table 5 the amount of Compensation of FIVA (average amount, Unit: Euro)

| Disease | Victim alive | Victim died | Average |
|---|---|---|---|
| Asbestosis | 22,662 | 74,544 | 35,427 |
| Lung cancer | 89,668 | 134,992 | 120,131 |
| Pleural thickening | 19,068 | 26,131 | 19,490 |
| Mesothelioma | 97,114 | 121,333 | 115,360 |
| Others | 22,729 | 104,417 | 47,714 |
| Pleural plaque | 18,714 | 20,078 | 18,777 |
| Total average | 26,035 | 115,634 | 45,779 |

Source: Gakuto Takamura. "The situation and problems of asbestos compensation foundation in France", *Environment and Pollution,* Vol.38, No.4

In Hong Kong's case, promoted by the Hong Kong Workers' Health Centre, when a construction company contracts to build anything for more than HK$1 million, it contributes 0.25%

of that to the Pneumoconiosis Compensation Fund. This helps victims.

In Japanese case, the Japanese government established the Relief Act quickly, following France. Since then it has helped sufferers who are not acknowledged as workers' disease. Compared to France, however, the legal responsibility of the government is not prescribed clearly under law. In addition, the target range of sufferers and the amount of compensation are limited under the Act. Moreover, the number of trials is very few as compared with United States.

**(5) The safe pulling building down**

A coming big problem is the scatter of asbestos in the air when buildings are pulled down. In Japan, more than 5 million tons of asbestos are build up in buildings and it will come to the peak at the year 2020. For South Korea, also, the prevention of exposing to asbestos becomes a crucial problem. Moreover, some of workers who dealt with buildings collapsed by Hanshin-Awaji earthquake already died of mesothelioma. This is because any prevention measures were not taken when earthquake occurred. Until now, the government should investigate buildings accumulating asbestos and take any prevention measures against exposure to asbestos when earthquake occurs. Such a prevention measure is very important for Asian countries, especially China and Indonesia where earthquake happens frequently.

**(6) Organizing interdisciplinary research groups**

In Japan, almost all environmental researchers are not interested in damage by asbestos, because they regard it as workers' disease. Also, architects do not consider much about the risks of asbestos. However, asbestos problem cannot be solved as long as all fields of specialists do not work together. Thus, such interdisciplinary specialists group should be organized as soon as possible. Also, I hope that Asian international specialists group such as association and research center will exchange and be formed in near future.

**(7) Stop to export pollution and its responsibility**

As mentioned above, when the regulation in a developed country becomes strict, the dangerous factory moves to a developing country, such as from Japan to South Korea and Taiwan, from South Korea to Indonesia, and from Taiwan to China. Such an exporting pollution has to be stopped. Like the case of Japanese vessels, developed countries' ships and vessels are broken down in Bangladesh and India. This is to export pollution. It causes industrial disaster even though this is just recycling for developing countries to keep resources. This is a severe problem for Asian countries to prevent and stop disaster caused by asbestos internationally.

**(8) Toward non-asbestos societies**

A lot of Asian countries and community usually use a large amount of chrysotile for safety, although its damage is obvious. If they use alternative materials, there will be no economic losses. Therefore, using all kinds of asbestos including chrysotile should be prohibited. In order to do so, Canadian chrysotile which Asian countries use because of safety has to be banned.

---

([i]」 Kenichi Miyamoto " Internalization for Environmental Policies " (Japanese,"Kankyo Seisaku no Kokusaika",Jitsukyo Syupan)

([ii])Yeon-Soon AHN & Seong-Kyu Kang , Asbestos-related Occupational Cancers Compensated under the Industrial Accident Compensation Insurance in Korea. ("Industrial Health " no.47 2009)

([iii])Lukas Jyuhn-Hsiarn Lee, Yu-Yin Chang & Jung-Der Wang ,Impact of malignant methothelioma in Taiwan : A 27 year review of population-based cancer registry data ("Lung Cancer" no. 68,2010)

([iv]) Hearing from Chinese Center for Disease Control and Prevention and Department of Occupational Safety and Health Supervision. Shyu Iy Sei and Others ,Asbestos problems and policies in China ( Japanese " Asbesto mondai " Ritumeikan Seisakukagaku" 2008)

([v])Kenichi Miyamoto , Some Problems of Asbestos Disaster in Earthquake ( Japanese 2011,Iwanamishoten)

([vi]) Asbestos Litigation Costs and Compensation (Rand, 2002)

([vii] ) Gakuto Takamura, The situation and problems of asbestos compensation (FIVA) in France ( Japanese " Kankyo to Kogai " vol. 38 no.4)

# ILO Programme for the Elimination of Asbestos-Related Diseases

**Seiji MACHIDA**
Director, Programme on Safety and Health at Work and the Environment (SafeWork) ILO Geneva

## Decent work – Safe Work

The ILO estimates that about 2.3 million workers die each year from work-related accidents and diseases. Occupational Safety and Health (OSH) has been a central issue for the ILO ever since its creation in 1919 and continues to be a fundamental requirement for achieving the objectives of the Decent Work Agenda. The ILO has been developing a number of international labour standards on OSH in the forms of Conventions and Recommendations, which are international treaties, as well as codes of practice. Key OSH Conventions include Occupational Safety and Health Convention (No.155), Occupational Health Services Convention (No.161) and the Promotional Framework for Occupational Safety and Health Convention (No.187). The latter was developed in 2006 with a view to promoting systems approach to occupational safety and health at the national level. New standards are also expected to support national tripartite efforts to place OSH high at national agendas as well as to improve application and ratification of existing ILO OSH Conventions[1]. Solutions for the elimination of asbestos-related diseases have to be pursued within a broader national strategy and programmes on OSH, particularly in developing countries.

## Asbestos: A global concern

Exposure to asbestos causes asbestosis, a non-malignant diffuse interstitial pulmonary fibrosis of the lung, lung cancer as well as malignant mesothelioma of the pleura, peritoneum and pericardium. Because of the long latency periods of these diseases, it will take decades before a noticeable decrease in the number of asbestos-related deaths could be observed even in countries that have banned the use of asbestos since 1990s. All types of asbestos (actinolite, amosite, anthophyllite, crocidolie, tremolite and chrysotile) have been classified by the International Agency for Research on Cancer (IARC) of the WHO as being carcinogenic to humans. The use of crocidolite and products containing this fibre, as well as spraying of all forms of asbestos, have been prohibited under the ILO Convention concerning Safety in the Use of Asbestos, 1986, (No.162). However, chrysotile asbestos, which accounts for 90% of all uses of asbestos today, is still widely used, mostly for asbestos-cement building materials, and mostly in developing countries.

In addition to the continued use of asbestos, the work on asbestos containing materials already in place also necessitates strict preventive measures to avoid exposure from asbestos removal, as well as reparation, maintenance and demolition works. The ship breaking industry in Asia is another example of this problem. An average size ship being dismantled today contains about 6-7 tons of asbestos. Workers scrap and repackage these materials, often without any protective measures, and place themselves at unacceptable risk. It is not rare that the asbestos removed from the dismantled ships is used again somewhere in the country.

## International Instruments

*Relevant ILO standards*

[1] Full text of Conventions are available at http://www.ilo.org/ilolex/english/index.htm

There are several ILO Conventions addressing safety in the use of asbestos. The Occupational Cancer Convention, 1974 (No.139) requires Parties to "periodically determine the carcinogenic substances and agents to which occupational exposure shall be prohibited or made subject to authorization or control..."(Article 1). Parties to the Convention "shall make every effort to have carcinogenic substances and agents to which workers may be exposed in the course of their work replaced by non-carcinogenic substances or agents or by less harmful substances or agents; in the choice of substitute substances or agents account shall be taken of their carcinogenic, toxic and other properties" (Article 2).

The Asbestos Convention, 1986 (No.162) provides that "where necessary to protect the health of workers and technically practicable, national laws or regulations shall provide for one or more of the following measures - (a) replacement of asbestos or certain types of asbestos or products containing asbestos by other materials or products or the use of alternative technology, scientifically evaluated by the competent authorities as harmless or less harmful, whenever this is possible; (b) total or partial prohibition of the use of asbestos or certain types of asbestos or products containing asbestos in certain work processes." (Article 10). The Asbestos Convention prohibits the use of crocidolite and products containing this fibre, as well as spraying of all forms of asbestos. The ILO code of practice on safety in the use of asbestos[2] adopted in 1984 provides further guidance on action at the national and enterprise levels. In 2004, The ILO developed "Safety and Health in Ship-breaking, Guidelines for Asian countries and Turkey" which also address the issues of asbestos at ship dismantling. The guidelines were translated into many languages.

The Chemicals Convention, 1990 (No.170) requires that "when in an exporting member State all or some uses of hazardous chemicals are prohibited for reasons of safety and health at work, this fact and the reasons for it shall be communicated by the exporting member State to any importing country" (Article 19).

The Resolution on Asbestos of the 95th International Labour Conference (2006) stipulates that the elimination of the future use of asbestos and the identification and proper management of asbestos currently in place are the most effective means to protect workers from asbestos exposure and to prevent future asbestos-related diseases and deaths. It also indicates that the Asbestos Convention, 1986 (No.162), should not be used to provide a justification for, or endorsement of, the continued use of asbestos. It encourages countries to ratify and give effect to the provisions of the Asbestos Convention, 1986, (No.162) and the Occupational Cancer Convention, 1974, (No.139) to promote the elimination of future use of all forms of asbestos and asbestos containing materials; to promote the identification and proper management of all forms of asbestos currently in place; and to include measures in national programmes on occupational safety and health to protect workers from exposure to asbestos. Full text of the Resolution is attached as Annex 1.

Table 1: Ratification status of ILO Conventions as of November 2010

| Convention | Total ratification | Ratification in Asia |
|---|---|---|
| No.139 | 38 | Japan |
| No.155 | 56 | Republic of Korea, Mongolia, Vietnam |
| No.162 | 32 | Japan, Republic of Korea |

[2] ILO Code of Practice on Safey in the Use of Asbestos, full text at http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107843.pdf

| | | |
|---|---|---|
| No.170 | 17 | China, Republic of Korea |
| No.187 | 16 | Japan, Republic of Korea |

*Multilateral environmental agreements*

There are two main multilateral environmental agreements that play an important role in international trade and management of asbestos. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade includes all types of asbestos of the amphibole group in its Annex III of banned or severely restricted substances that are subject to the prior informed consent procedure[3]. The 2006 Conference of the Parties to the Rotterdam Convention decided that chrysotile asbestos meets the requirements and the criteria for inclusion in Annex III of the Convention and that the 2008 Conference shall further consider its inclusion in Annex III. Furthermore, wastes that contain asbestos dust and asbestos fibres are considered a hazardous waste (Annex I, item Y36) under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal[4], and are, therefore, subject to strict control.

*WHO recommendations*

The 58th World Health Assembly urged Member States to pay special attention to cancers for which avoidable exposure is a factor, particularly exposure to chemicals at the workplace and the environment. Asbestos is one of the most important occupational carcinogens causing about half of the deaths from occupational cancer. In May 2007, the 60th World Health Assembly endorsed a global plan of action on workers' health 2008-2017 in which Member States requested the WHO Secretariat to include in its activities "a global campaign for elimination of asbestos-related diseases - bearing in mind a differentiated approach to regulating its various forms - in line with the relevant international legal instruments and the latest evidence for effective interventions..."[5]. WHO's assistance to countries to eliminate asbestos-related diseases will therefore be particularly targeted to those Member States that still use chrysotile asbestos, in addition to assistance in relation to exposures arising from historical use of all forms of asbestos.

**Promoting national strategic approach**

The ILO and WHO are promoting national strategic approach through formulation and implementation of National programmes for elimination of asbestos-related diseases (NPEAD)[6]. Summary of this approach is provided as Annex 2. These programmes could be part of National Programme for Elimination of Silicosis (NPES)[7], which takes the same approach of developing a comprehensive national action program based on the analysis of a national profile. NPES was introduced more than 10years ago. To date, preventive activities for silicosis and other pneumoconioses have been sharply increased with 47 major projects and NPES established in: Brazil, Chile, China, India, Peru, South-Africa, Thailand, Turkey, Vietnam and Colombia (drafted and to be adopted soon). NPEAD is a means of action but the idea is to scale up

[3] UNEP/FAO Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; available at http://www.pic.int/

[4] UNEP Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal; available at http://www.basel.int/

[5] See paragraph 10 in the Annex of WHA 60.26 Workers' Health: Global Plan of Action, available at http://www.who.int/gb/ebwha/pdf_files/WHA60/A60_R26-en.pdf

[6] See http://www.ilo.org/safework/info/publications/lang--en/docName--WCMS_108555/index.htm

[7] See http://www.ilo.org/safework/info/lang--en/WCMS_108566/index.htm

activities to prevent asbestos-related diseases (ARD) with setting up either separate action programs as NPEAD or linking it to the comprehensive national OSH programmes.

**Inter-Agency collaboration**

UNEP/ILO/WHO International Programme on Chemical Safety (IPCS) has been publishing useful technical guidance documents over the years. Among others they include IPCS "Environmental Health Criteria 203: Chrysotile Asbestos"[8] and the IPCS International Chemical Safety Card on Chrysotile[9]

The ILO, WHO, Rotterdam and Basel Convention Secretariats of UNEP have set up an inter-agency group on asbestos to coordinate activities in this area. The Rotterdam Convention's programme also links it to a larger chemical safety management with special emphasis, with special emphasis on asbestos, in the Asia-Pacific Region. They have a Technical Cooperation Project funded by Japan to raise awareness on asbestos-related health risks in Asia. The inter-agency meeting was held in August-September, 2010, in Bangkok with ILO contribution. Further national workshops are to be conducted in selected Asian countries under this project. Rotterdam Convention Secretariat, ILO and WHO are preparing a comprehensive Toolkit on Asbestos to be ready in 2011 for pilot use at the national workshops.

The WHO and ILO have prepared three SAICM quick start Technical Cooperation projects to raise awareness and act on asbestos as a priority carcinogen. Thailand has already started the implementation, Sri-Lanka and Indonesia are about to start soon.

**International and national meetings**

The ILO organized national asbestos workshops to promote action on asbestos and the implementation of the ILO Resolution on Asbestos in Vietnam (2006), Thailand (2007) and Korea (2008). The ILO also organized a workshop in Vietnam (2008) jointly with the Building and Wood Workers' International (BWI) Asia, and is preparing another one for Malaysia for 2011 (with BWI Asia) to promote NPEAD.

The ILO organized special sessions on asbestos with ITUC and ISSA at the 18th Congress on Safety and Health at Work held in Korea in 2008. Asbestos-related matters were widely discussed at the 9th International Conference on Occupational Respiratory Diseases (ICORD) held in Kyoto in 1997 and at the 10th ICORD held in Beijing in 2005. The ILO contributed to the development and supported the implementation of the Asian Asbestos Initiative (AAI) – which was announced at the 10th ICORD. The ILO participated in AAI meetings: 1st (Kitakyushu, 2008), 2nd (Bangkok, 2009), 3rd (Fukuoka, 2010). The ILO supported and contributed to the Global Asbestos Congress in Japan (2004), Asian Asbestos Conferences held in Bangkok (2006) and in Hong Kong (2009).

The ILO has been training specialists in developing countries to strengthen national systems of health surveillance for early detection and prevention of silica- and asbestos related diseases and other penumoconioses. National workshops were held in Vietnam, Thailand, Malaysia, Indonesia, and India in Asia and in Turkey, Brazil, Chile and Peru in other parts of the world. These workshops provided training for upgrading skills of specialists of these countries to use the ILO International Classification of Radiographs of Pneumoconioses which is indispensable tool for health surveillance of workers exposed to dusts. Most recently a workshop was held in Vietnam in 2010 and another workshop is planned for Malaysia in 2011.

[8] Please see http://www.inchem.org/documents/ehc/ehc/ehc203.htm
[9] Please see http://www.ilo.org/legacy/english/protection/safework/cis/products/icsc/dtasht/_icsc00/icsc0014.htm

The ILO supported the creation of the Asian Intensive Reader of Pneumoconiosis Project (AIR Pneumo), which aims at upgrading skills of specialists in Asian countries in the application of the ILO International Classification of Radiographs of Pneumoconioses and contributes to the implementation of the ILO/WHO Global Programme for Elimination of Silicosis (GPES). A train-the-trainer workshop was held in Thailand in 2008 to train Thai specialists. In December 2010, a workshop will be held with the certification and participation of specialists also from India and Vietnam.