The 18th Asian Parliamentarians' Meeting on Population and Development

March 27-28, 2002
Tokyo, Japan

THE ASIAN POPULATION AND DEVELOPMENT ASSOCIATION
(APDA)

CONTENTS

PROGRAM

The 18th Asian Parliamentarians' Meeting on Population and Development

—Water and Sanitation, Regional Development and Population—

March 27 (Wednesday) and 28 (Thursday), 2002

Hotel New Otani, The "UME" Room (The Main, Banquet Floor)

Wednesday, March 27, 2002

Opening Ceremony

10:00 – 10:30	Address:	Dr. Taro Nakayama, MP, APDA Chairman
	Address:	Mr. Yoshio Yatsu, MP, AFPPD Chairman
	Address:	Mr. Kunio Waki, UNFPA Deputy Executive Director
	Address:	Mrs. Ingar Brueggemann, IPPF Director-General
	(Master of Ceremony: Mr.Tsuguo Hirose, Executive Director/Secretary General, APDA)	
10:30 – 11:00	Group Photo / Tea Break	

Keynote Address: "Global Society and Water in the 21st Century"

11:00 – 12:00	Speaker:	Prof. Kazuo Takahashi Professor of International Christian University Member of the Club of Tokyo
12:00 – 13:30	Lunch (The "KATSURA" Room, The Main, Banquet Floor)	

Session I: "Water and Health"

14:00 – 14:30	Chairperson:	Dr. Malinee Sukavejworakit, MP (Thailand)
	Resource Person:	Dr. Eimatsu Takakuwa, Professor Emeritus, Hokkaido University
14:30 – 15:30	Discussion	
15:30 – 15:45	Tea Break	

Session II: "Irrigation and Rural Issues"

15:45 – 16:15	Chairperson:	Mr. R. L. Bhatia, MP (India)
	Resource Person:	Prof. Nobumasa Hatcho, Professor of Kinki University

16:15 – 17:15 Discussion

18:30 – Dinner Reception ("Orizuru-SHO" Room, The Main, Arcade Floor)

20:00 – AFPPD Executive Committee Meeting

Thursday, March 28, 2002

Session III: "Water and Population Issues in Rural Areas"

09:00 – 09:30 Chairperson: Mr. Zhang Huaixi, MP (China)
Resource Person: Ms. Keiko Yamamoto, JICA Senior Adviser

09:30 – 10:30 Discussion

10:30 – 10:50 Tea Break

Session IV: "Water and Cities"

10:50 – 11:15 Chairperson: Ms. Kelly Hoare, MP (Australia)
Resource Person: Prof. Yasumoto Magara, Professor of Hokkaido University, Graduate School of Engineering

11:15 – 11:40 Resource Person: Mr. Yuri Steklov, Economic Affairs Officer, Water and Natural Resources Section, ESCAP Bangkok

11:40 – 12:30 Discussion

12:30 – 14:00 Lunch Reception (The "KATSURA" Room, The Main, Banquet Floor)

Session V: Panel Discussion: Parliamentarians and Water Management

14:00 – 16:00 Moderator: Dato' Napsiah Binti Omar, MP (Malaysia)
Panelists: Dr. V. Saroja, MP (India)
Mr. Yu En'guang, MP (China)
Dr. Surya Chandra SURAPATY (Indonesia)
Ms. Phillida Bunkle, MP (New Zealand)
Dr. Emilio C. Macias II, MP (Philippines)

16:00 – 16:15 Tea Break

Closing Ceremony

16:15 – 16:45 Address: Dr. Taro Nakayama, MP, APDA Chairman

Address: Mr. Zhang Huaixi, MP, AFPPD Vice Chairman

(Master of Ceremony: Mr.Tsuguo Hirose, Executive Director/Secretary General (Asian Population and Development Association) APDA)

OPENING CEREMONY

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Deputy Executive Director, UNFPA

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Director-General, IPPF

Address

Dr. Taro Nakayama, MP
Chairman
Asian Population and Development Association

The Honourable Yoshio Yatsu, MP, AFPPD Chairman,
Honourable parliamentary colleagues,
Mr. Kunio Waki, UNFPA Deputy Executive-Director,
Mrs. Ingar Brueggemann, IPPF Director-General,
Eminent speakers, ladies and gentlemen,

I wish to thank you sincerely for joining us at the 18th Asian Parliamentarians' Meeting on Population and Development, and greatly appreciate your presence here today.

I am sure that the various programs and presentations made since yesterday have given you a greater understanding of the activities of APDA in the last twenty years. It is with your participation and generous cooperation that we were able to successfully carry out the Public Forum and the Commemorative Ceremony. Thank you indeed.

The population issues we are addressing together are the basis of the security of our survival on this earth. If the population problem is not resolved, human beings simply cannot continue to live on the planet.

As elected representatives of our peoples, we must recognize the overwhelming importance of this issue and seriously consider the relationship we humans have with the earth, and what kind of world we wish to bequeath our children and grandchildren. We should then formulate necessary policies and make representations to national governments for their implementation.

We are a part of history, and are contributing to the making of human history. The future is ours to build. And that makes our efforts all the more meaningful.

We know there is no magic formula that will rapidly change everything. But we do know that if each of us changes and does our part in changing what needs to be changed, then we can make the future happier, richer and more peaceful.

We have selected "Water" as the theme of our meeting this year continuing from the same theme last year. Last year, the focus was on "Water and the Global Environment." This year, we wish to address pressing issues nearer to our situation such as "Water and Health and Regional Development and Population."

The keynote lecture will present an overview: "Global Society and Water in the 21st Century." It will be followed by presentations made by authoritative scholars in their respective fields addressing themes such as "Water and Health," "Water-born Infectious Disease and Irrigation," and "Water in Rural Areas and Cities." I am sure the presentations will be impressive as well as informative.

The 21st century has been dubbed as "The Century of Water," and there are already concerns about international conflicts over water. Time is always a limited commodity, and so I sincerely hope, as the host, that the two days will prove to be useful to you as you consider "water and health as well as regional development and population," which are inseparable from the population problem.

You have come to Japan at its most beautiful season of cherry blossoms. If you care to take a walk around the hotel, you will see areas which are noted for their scenic splendour. Our hospitality may not be as sumptuous as we would like, but we will do everything in our power to make your stay comfortable and worthwhile.

Thank you very much.

Address

Mr. Yoshio Yatsu, MP
Chairman
Asian Forum of Parliamentarians on Population and Development

The Honourable Taro Nakayama, MP, APDA Chairman,
My honourable legislative colleagues,
Mr. Kunio Waki, UNFPA Deputy Executive-Director,
Mrs. Ingar Brueggemann, IPPF Director-General,
Distinguished lecturers, ladies and gentlemen,

At the outset, let me thank you greatly for your presence at the 18th Asian Parliamentarians' Meeting on Population and Development. I would like to thank Mr. Tsuguo Hirose, APDA Executive Director and all those at the secretariat who have done so much to prepare the meeting under the leadership of Dr. Taro Nakayama, APDA Chairman and Ms. Kayoko Shimizu, APDA Vice-Chairperson.

Let me also share with you the joy of celebrating the twentieth anniversary of APDA, and I thank everyone for your loyal support in the past. On this auspicious occasion, I would like to ask for your continued support for the greater growth of parliamentarians' activities on population and development, under an even closer relationship between the two sister organizations of AFPPD and APDA.

As you know, our theme of this year is "Water and Sanitation, Regional Development and Population". Following up on the last year's theme focusing on Water and the Global Environment, this year, we will be addressing issues closer to home, including Water and Health and Regional Development and Population. These areas require urgent measures to be taken, if conditions arising from population pressures in Asia are to be improved, and so this theme should be a directly benefit to our endeavours. I offer my deep respects to APDA for selecting this important theme.

Population issues encompass all areas of human activities. Food, social stability, security, social welfare, and a host of other problems are closely linked to population, none of which can be ignored. I am acutely aware that as politicians, we are constantly under public scrutiny as to whether we are seriously tackling each issue and taking necessary and steady actions.
At the same time, the measures we adopt in regard to population are part of the process of building a society that enables each person to live with dignity as a human being, transcending different culture and values. If we decide to boldly address the issues, nurture public opinion and involve national governments, then we can create a brighter future.

As Chairman Nakayama said yesterday at the Commemorative Ceremony, our world is full of strife, but we are not without hope. I am convinced that the activities we undertake as parliamentarians have a great potential and hope. Let us continue to work to make the hope a reality.

With your cooperation, we shall steadily work toward our goals.

Thank you for your attention.

Address

Mr. Kunio Waki
Deputy Executive Director
United Nations Population Fund

Dr. Taro Nakayama, Chairman of APDA,
Mr. Yoshio Yatsu, Chairman of AFPPD,
Honourable parliamentarians, Distinguished Resource Persons, Ladies and Gentlemen,

I am deeply honoured to address the 18th Asian Parliamentarians' Meeting on Population and Development, organized by the Asian Population and Development Association (APDA).

On behalf of our Executive Director, Thoraya Obaid, I would like to convey UNFPA's deep gratitude and highest acknowledgements for untiring contributions and dedication of parliamentarians like you to the welfare of the people in the Asia and Pacific region. We count on your leadership and continued efforts in your own countries and in the whole region in the implementation of the ICPD Programme of Actions.

I would like to take advantage of this opportunity to thank Mr. Yatsu for writing to President Bush as Chair of AFPPD requesting him to consider favourably this year's US contribution to UNFPA. Due to both the economic and political reasons, we are facing the possibility of the reduction of our regular resource income by almost 50 million dollars. We appreciate any support you would provide in restoring our income so that we can continue to provide much needed support to the reproductive health services for the disadvantaged women and girls throughout the world.

I am very happy to be able to join you in the celebration of the twentieth anniversary of APDA. We, the staffs of UNFPA, would like to express our heart-felt congratulations to the present and past leaders of APDA who initiated and led both regional and global parliamentarian movement on population and development. We are very grateful to them for their personal dedication and untiring efforts, and wish them all the best for the next twenty years of successful activities.

The theme of this meeting on water, sanitation, regional development and population offers us a special opportunity to address our shared concerns within the context of our efforts to reduce poverty and attain sustainable development in a practical and humane manner, and through strengthened regional partnership for Asia and the Pacific.

Asian Parliamentarians have been in the forefront of the call for a balance between population dynamics and water and food security, sanitation, the environmental protection and sustainable development for all. This important issue will be discussed at the World Summit for Sustainable Development, to be held in Johannesburg later this year.

Over one billion people lack access to safe drinking water, while two and a half billion people lack adequate sanitation. Many countries facing water scarcity today are low-income communities with rapidly growing populations, generally not able to make costly investments in

water-saving technologies. The provision of safe drinking water becomes a greater challenge as economic development and population growth place increased demands on limited water resources. Eighty percent of the global population without access to improved sanitation and almost two-thirds without access to improved water supply are Asians.

Currently, we human beings are using about half the fresh water that is readily available. Fresh water is distributed unevenly over the world, and already, nearly half a billion people are affected by water stress or serious water scarcity, while many more are experiencing moderate stress. Given current trends, by 2050, up to two-thirds of the world's population may be subject to moderate-to-high water stress.

Yesterday, we learned a lot about the problems of human existence on the earth and our important relations with plants and animals at the Forum. We also learned that the population growth today remains a phenomenon of major concern for sustainable development, along with unchanging patterns of unsustainable production and consumption. While relative population growth rates have fallen in recent years, we are still facing today an absolute increase of 75 million people per year. Much of this growth is taking place in the Asia and Pacific region—especially in the already populous countries of India, China, Indonesia, Pakistan and Bangladesh. Rapid urbanisation will also continue, with the proportion of Asia's population living in urban areas growing from 37 per cent today to 51 per cent in 2025.

The implications of this rapid growth for sustainable development and the environment, for food and water security and sanitation will be far-reaching. The Millennium Declaration target is to halve the proportion of people unable to reach or afford safe drinking water, between 1990 and 2015. Population growth will continue to place great strains on the already over-burdened services, particularly of urban communities. To meet the international development target of halving the population without access to water in Asia and the Pacific alone, an estimated additional 980 million people will need access to water supply and an additional 1.5 billion people will need access to sanitation facilities. Women, the elderly and children form a disproportionate share of those who are adversely affected. This is the challenge facing us today.

Women fulfil a crucial role as agents for development and as guardians of progress. Appropriate support in line with the recommendations of the 1994 ICPD Programme of Action, can enhance women's choices regarding reproduction, their reproductive health, education, economic participation and their key role as resource managers for sustainable development. They need the means to be guardians of water and food security as they make us half of the world's agricultural work force. They need legal and social support for land ownership, tenure and inheritance. They need guaranteed access to credit, to basic social, environmental and economic services for agricultural and resource management.

We have made some gains and women have been empowered by giving them opportunities regarding birth spacing and family size. In India, the average woman has three children compared to five just two yeas ago. In Bangladesh today, women choose to have half as many children as they did 20 years ago. In Indonesia, the average family size has fallen from more than four children in 1980 to between two and three children today. On average, globally, close to 60 percent of married women in developing countries are using modern methods of family planning compared to ten percent 40 years ago. Women are the key to sustainable development and we must continue to invest in their continued enhanced choices.

UNFPA is working with more than 140 developing countries to help meet their population and sustainable development goals. Even with less resource, we are introducing more cost-effective measures to accelerate our programme impact. UNFPA is committed to the collective global responsibility to ensure sustainable development for all.

Our 2001 State of the World Population Report was dedicated to population, development and environmental protection in preparation for the forthcoming Summit in Johannesburg. It offers policy makers and activists an overview of the demographic challenges, environmental trends and recommendations and actions. This year's State of the World Population Report will discuss the important relations between poverty and population dynamics.

The critical role you play in highlighting population and sustainable development linkages and in the area of water and food security and poverty reduction must be reinforced and heard on the road to Johannesburg. Now more than ever before, your initiatives in enacting appropriate legislation to address population linked to sustainable development issues, including creating an enabling environment for civil society and the private sector become important to protect individual lives of the poorest. UNFPA will continue to support your unique efforts for sustainable development for all.

I wish you all the best for your continued successful advocacy and legislative activities for population and development. We the staff of UNFPA will all be behind you for your continued efforts.

Thank you for your attention.

Address

Mrs. Ingar Brueggemann
Director General
International Planned Parenthood Federation

Introduction

You may well ask what IPPF has got to do with the issue of water. Well, IPPF is concerned with health, poverty and development. And water, both directly and indirectly, affects all of these – often negatively as we are all too well aware.

But I would like firstly to turn to the relationship between water and population.

Population & Water

The relationship between population and water is a crucial one. Whilst we have seen recent declines in global population growth, the outlook for future water availability in many countries is dire and the problem of water scarcity will continue to grow as the world's population increases. Indeed, estimates are that one fourth of the world's people are likely to live in countries facing chronic or recurring shortages of fresh water by the year 2050.

As population increases, the amount of fresh water available to each person decreases. For example, Canada and China have approximately equal supplies of renewable fresh water. Yet due to the vast difference in the size of their populations, each person in China has less than 3 per cent of the fresh water available to each Canadian.

And population growth in one country can reduce the amount of fresh water available not only to its own citizens, but also to those of neighbouring countries that share the same source of water. For instance, the Blue Nile originates in Ethiopia yet provides Egypt with more than 85 per cent of its water supply. As Ethiopia's population grows – the UN projects it will at least triple within 50 years – the resulting increase in its demand for water threatens to seriously reduce the river's flow into Egypt.

Clearly, slower population growth delays the onset of freshwater scarcity and it brakes the acceleration in the demand. Sri Lanka and El Salvador are two countries in which the onset of water stress will be delayed by at least a decade as a result of their slower population growth rates reflected in recent population projections. This additional time will provide much-needed breathing room to develop alternative sources of water also.

Moving on to three other critical areas of concern, water's impact on health, poverty and development is fundamental.

Water and Health

Water and health are two of our most precious resources. And there is a direct inter-relationship between the two.

The increasing scarcity of fresh water supplies threatens human health and human welfare. The

World Health Organization says diarrhoeal diseases remain a leading cause of illness and death in the developing world. Every year, some 2.2 million people die from diarrhoea; 90 per cent of these deaths among children, mostly in developing countries.

Tragically, it is children who are the most vulnerable to diseases which result from both lack of water and dirty water. In developing countries, each child has an average of 10 attacks of diarrhoea before the age of five, and one in 10 children die of diarrhoea and dehydration.

Water and Poverty

The 1.1 billion people without access to water sources and the 2.4 billion without basic sanitation include the poorest people in the world – and some of the unhealthiest. A first step towards alleviating poverty is to acknowledge the many components, as well as note the major contribution of water and sanitation to poverty alleviation.

Evidence shows that improved access to water and sanitation reduces poverty both directly and indirectly. This is due in large part to;
The saving of time - so allowing, for example, increased agriculture production;
The saving of money due to reduced costs of water and the need for medical treatment from waterborne diseases; Increased availability of water sources leading to increased livestock and crop production.

For these very reasons, poverty reduction strategies must include effective water and sanitation interventions if they are to achieve long-term success.

Water and Development

Access to water and sanitation is a necessary precursor to other forms of development. But it will become a major limiting factor in socio-economic development unless we take action now. As we work towards sustainable development – that is development where people's needs are met and their quality of life improved in the present while safeguarding the ability of future generations to meet their own needs – we have to secure the political will and leadership to act innovatively and decisively.

What can we do – as parliamentarians/NGOs?

So, what can we do? As parliamentarians, you have a potentially powerful role as leading advocates on issues raising awareness and action at the highest political level. The development agenda is a full one, but you have the opportunity to influence and shape this agenda at the national level and beyond.
As parliamentarians, you also have opportunities to influence your country's annual budget, including allocation of ODA. You can open doors for discussions in society on population and development matters and work in collaboration with NGOs – something that we have, and I know will continue to do successfully.

Conclusion

Water is needed in all aspects of life. And in many parts of the world, there will be no transition to sustainable development without a transition to water sustainability.

Despite current serious concerns regarding the scarcity and degradation of the quality of freshwater resources in large areas of the world, water need not become a limiting factor for

sustainable development and human welfare, particularly if vigorous action is taken now towards an integrated approach.

All life on earth depends on water – and IPPF believes that if we look after the people, the people will look after the planet!

Thank you.

KEYNOTE ADDRESS

"Global Water Issues in the 21st Century"

Dr. Kazuo Takahashi
Professor, International Christian University

Introduction

Human history was characterized by a struggle to secure water for life until the beginning of the Industrial Revolution; religions, cultures, socio-political structures, civilizations, all revolving around water.

For over two centuries, it has been thought that other major issues such as colonialism, revolution, and world wars have become dominant issues for humanity, whereas water, in fact, has continued to be the major concern for the majority of humanity.

In the course of the 1990s, water began to emerge as a major issue in the world community due to: the end of the Cold War which was the major factor which dictated the logic of the power structure of the world community in the latter half of the 20th century; the total failure in achieving the objectives of the provision of save drinking water and sanitation to the whole world in the course of the 1980s as agreed at the U.N. Conference on Water in 1977, and the realization of dangerous implications of the trebling of population and seven times of water consumption in the course of the 20th century.

Policy environment has changed considerably in the world community after September 11, 2001, impacting also on water issues. Water, having become a political issue in the course of the 1990s, is now becoming an even more salient issue in the world community.

Against these backgrounds, the objective of my speech is to provide a tour d'horizon of emerging global water issues after September 11, combining factors that are related to long-term trends and the heightened concern with security, thus dealing with;
governance,
peace-building,
finance
trade,
technology, and
poverty.

I. Governance in Water Management

Governance is the key concept in the post September 11 world. This was the major concern at the Senior Officials' Meeting of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) in Paris in December 2001, and it was the most important issue at the Monterrey Summit meeting on Finance for Development last week. In the water sector, governance has been recognized as the major issue for these several decades ever since a comprehensive and integrated approach to water issues was proposed by Dr. White of the United States in the late 1940s. The question of governance in the water sector has been discussed in the context of the river basis, local

community, national government, international regional cooperation and a global organization. In the coming months up to and beyond Johannesburg (August-September this year), we are bound to discuss traditional governance issues in the water sector in the context of increasing importance of security concerns.

The major fora will be the meeting of the Club of Tokyo for global water management in Alexandria, Egypt in early August, and the Stockholm Water Symposium in Sweden in mid-August. A preliminary exchange of views will be pursued also in the context of the Johannesburg summit on sustainable development. Traditional issues include comprehensive water management where participation of all the stakeholders is the central concern, management of international rivers and lakes where establishment of legal regimes is the critical component and strengthening of international governance where establishment of an international organization for water with the participation of government, business and civil society has become a major concern. The question is how to integrate security concerns into these traditional issues.

II. Water for Peace-building

Armed conflicts have been increasing significantly since 1996, involving not only developing countries, but also industrialized countries gradually, leading to September 11. The number of armed conflicts has been increasing from 95 in 1996 to 124 in 1997, 200 in 1998, 250 in 1999, 282 in 2000, and probably well over 300 in 2001 as calculated by Dr. Jongman at the Leiden University. Social trust in most developing countries has been undermined by colonialism, modernization and market based globalization. The dramatic increase in armed conflicts is the final blow to social trust in these societies. Peace building of these societies has to be centred around efforts to re-establish social trust in each of these countries. Community building, the health sector development and primary education are the starting points for these efforts. Water is an essential component in all of these endeavours like in the case of Afghanistan. Water in the context of peace-building is an emerging issue in the post- September 11 world, and should now be integrated into the efforts to re-build social trust in each country. Working together to secure water strengthens community relations, and communities can often be built around water. The healing impact of water itself for those who suffer from psychological trauma will be significant.

III. Financing Water Development

The Report of the World Commission for Water in the 21st Century estimated that $180 billion need to be invested in the water sector each year in the developing world so that a water secure world should be established. The current total ODA being around $56 billion a year (around $3 billion for the water sector), and with its additional increase as indicated last week by the United States and the European Union reaching probably close to $65 billion globally (up to $5 billion for the water sector) in the coming three years' time, large part of the finance has to come from the private sector. The full cost pricing for water has been advocated by the OECD for OECD countries for over 10 years, and its formula has been encouraged for global application by the World Commission for Water in its Report of 2000, which is, however, heavily nuanced with regard to the poverty question and also by the World Water Partnership which is now advocating strongly even for poorer developing countries. This issue, along with the issue of dam construction, has been the most ideological question in the water sector.

However, after September 11, there has been an increasing tendency in municipal governments

to either suspend privatization or to stop it completely due to heightened concern with security issues. Therefore, the scope for the application of full cost pricing by private firms has now been reduced. The ideological debate having been based on the assumption of rapid expansion of privatization of the water sector from the current level of 5 percent to 40 or 50 percent, the basis of it has now been weakened considerably.

The new issue is how to combine the public sector's guarantee of water security with private sector's money and managerial capacity. Reflecting on experiences in other sectors such as housing, education and medical care, the financing issue in the water sector will be articulated by putting theses two factors together in the coming period.

IV. Trade in Virtual Water

The Ministerial Conference of WTO at Doha in November 2001 was also heavily influenced by September 11. The perspectives of developing countries were strongly registered in agreeing to launch the WTO Round, a round which is now called by many experts the first development round. It is inevitable that agricultural products, which are well known to be virtual water, will be highlighted. However, with increasing concern with water which takes about 90% of water consumption in the developing world, expansion in export opportunity of agricultural products by developing countries may not be the only concern in these countries. In producing virtual water, allocation of water for other purposes such as drinking, environmental conservation, sewage treatment, and manufacturing has to be taken into consideration in dealing with the issues of trade liberalization in the agriculture sector in the current round of WTO. Therefore, while the new WTO round will put a high priority on agriculture in developing countries, the increasing salience of water issues will complicate the negotiation in the coming period.

V. Technology for Water

Increasing concerns with the difficulties developing countries are faced with may impact the traditional rules of the game in transfer of technology. In the water sector, desalination and precision watering are the highly relevant areas.

Desalination of sea waters has been pursued for decades, in particular since 1967 when the U.S. President, Mr. Johnson launched a program called "Water for Peace." The major factor has been the cost. It is generally estimated that if the cost of desalination comes down to 55 cents for one cubic meter, it should be financially feasible to apply it widely. The current cost being around 95 cents with an accelerating downward trend, it is expected that the cost may come down to 55 cents in 5 to 6 years. The desalination technology may suddenly become a high priority item in water stress countries in the near future. In particular, poorer countries among them will be keenly interested in it. A technology which is developed and owned by a private firm is normally transferable only as a business transaction. However, like in the case of medicine for HIV/AIDS in South Africa, will this technology be available for poorer countries virtually free of charge due to the perception that water is in essence life, thus, cannot be exploited by a business firm? How would governments of countries where these technologies are most highly developed including Japan, Korea, Italy, U.K. and U.S. respond to the inevitable calls of the international civil society for generous considerations?

Precision watering technologies also provide important opportunities to turn water stress countries into water secure nations. In these countries, agriculture takes almost 95% of water consumption. It is essential that the concept of agricultural productivity should be changed

from crop volumes per hector to yield per a drop of water. Economization of water consumption has to become a central policy concern in these countries. Precision watering technologies may become key instruments in water management in these countries. These technologies, most developed in Israel, might also become international concerns to be transferred to these countries in need.

The discussion of technology transfer in desalination and precision watering might become an integral part of the emerging debate on Global Public Goods where certain technologies such as medicine for HIV/AIDS are conceived of as Global Public Goods.

VI. Poverty and Water

Poverty has been the major concern in the development cooperation community for the past several years. It has largely been the reflection of the political agenda of the Social Democrats in the European Union with acquiescence of the Democratic presidency of the United States and of the administrative responses of Japan, rather than of altruistic concerns. However, while the power basis of social democratic agenda in the European Union has been undermined by the recent election results towards conservatism in Denmark, Italy and Portugal, the major cause for concern with poverty has now shifted to the alleged linkage between terrorism and poverty.

Water stress and poverty indeed have close linkage. Out of 48 least developed countries, more that 40 suffer from water scarcity. Poor rural areas and urban ghettoes are the communities that suffer from water security. Rip-off of water vendors is a widely spread practice in the informal sector in large cities.

Renewed attention to the least developed countries and extreme poverty is the context in which the poverty –water scarcity linkage has to be addressed in the coming period.

Concluding Remarks

It is essential that we address ourselves to the water issues (volume, quality and distribution) in the context of the post-September 11 concerns, which are rapidly evolving through important international gatherings. Considerable intellectual efforts need to be put into our joint tasks in articulating water issues in the new global context. It is historically a rare occasion for each one of us to participate in the creative policy process, and this forum will certainly provide an excellent opportunity to contribute to these efforts.

SESSION I

"Water and Health"

Session I

Chairperson:
Dr. Malinee Sukavejworakit, MP (Thailand)

Resource Person:
Dr. Eimatsu Takakuwa
Professor Emeritus, Hokkaido University

MR. HIROSE
We would like to introduce Dr. Malinee as the session chairperson for the first session. She is a senator of Thailand, Chairperson of Senate Committee on Public Health, and a very famous medical doctor in Thailand. She is also Vice Chairperson of AFPPD. Dr. Malinee, please.

DR. MALINEE
Thank you. Dear Friends. It is a great pleasure and a great honour to be a chairperson on this very important issue of water and health. Being a doctor, I can tell you how water and health are related. Just like the body, you need that circulation, which is comprised of blood vessel, blood plasma and red blood cell, to carry all kinds of food and oxygen to every organ to keep you in good health. Water has the same function to human beings. I would like to quote His Majesty King Bhumibol's words: "Water is life." The principle claims that there must be water for home consumption and for agriculture, because life depends on it. With water, man builds life. Without water, he will not. In this session, I am very proud to have one young gentleman who has a lot of experience on this issue to present this topic to you.

He graduated from a medical school, Hokkaido University, and got his master's degree on public health from University of Pittsburgh. His previous positions include: a professor of Hokkaido University Medical School, Director of Environmental Science Research Centre of Hokkaido University Graduate School, Deputy Director of National Pollution Research Centre in Ministry of Environment and an elected member of the House of Councillors in Japan, for two terms with total of twelve years. His current position is Professor Emeritus at Hokkaido University and a visiting professor at Kitazato University. As a member of the Parliament, for twelve years, he has contributed to the improvement of health system in Japan. He was the first parliamentarian to address the issue of HIV/AIDS in the Parliament. He was also a member of Japan Parliamentarians Federation for Population and visited more than ten Asian countries as a representative of JPFP.

Water and Health

Dr. Eimatsu Takakuwa
Professor Emeritus, Hokkaido University

The 17th APDA meeting was held last year in May in Auckland, New Zealand. The theme was Food Security and Water Resources. This was actually discussed from a population point of view last year. While population increases, we must never forget to consider for sustainable development. The water evaporates by solar energy to form clouds then once again turns into rain and falls down on the earth in the form of rain. Water therefore is a vital element in sustainable development.

I would like to talk about water and health, with some focus on population, for I have given some considerations on this point of view. Later in the lecture, I will use data obtained from the State of the World Children 2001 to analyze the current situation concerning public health.

I have considered these issues of water and health in relation to sustainable development. As Madam Chair has said, in 1954 to 1955, I was studying at the University of Pittsburgh, at the Graduate School of Public Health. I majored in occupational health and also studied drinking water and sewage treatment etc. Therefore, I am very happy to explain about water and public health.

By the way, when I was in Pittsburgh, I was a poor student. At that time, the dollar-yen exchange rate was one dollar to 360 yen. So, it provided a very difficult economic situation for us Japanese to live in the United States. Since I was a very poor student, I could not even think of a glass of good quality beer; thus, I had to revert to much cheaper local beer. Do you know what this is called? "Iron City." That was a Pittsburgh's nickname for this beer. Although the price was half of a good quality beer, it tasted horrible.

After thirty years, when I went to Pittsburgh again, I stayed at a good hotel and asked whether they had "Iron City." They said that they still had it, so I ordered and drank it. This time, the beer tasted so wonderful. I thought that the quality of the beer had improved over the 30 years; however, what actually changed was the quality of water they used to brew beer.

In 1954, the water was dirty red. It was the river water that they used to brew beer, and scent and flavour of the water remained, so it tasted horrible. Thirty years after that, quality of water improved very much. Since water quality improved, Pittsburgh's Iron City beer tasted just beautiful. So, if you are in Pittsburgh, don't forget to order "Iron City."

I was born in Sapporo in Japan, and Sapporo has No. 1 beer in Japan. Now it is a bit of commercial time; Please, drink Sapporo beer during your stay in Tokyo.

I would like to move on to the first category. This is something that is not included in public health, but I would like to talk about relationship between water and our life. In category one, I have put Water and Life. The first item on my outline is the aerial rate. In the northern hemisphere, the ratio of the land to the sea is 39.4 percent to 60.6 percent. In the southern hemisphere, the land is 19 percent and the sea is 81 percent. If you add up both and take an

average for the earth, the land area is 29 percent, while the sea accounts for 71 percent. Therefore, you can see that the sea is 2.4 times larger than the land space on earth. We are surrounded by a vast mass of water on this earth, and water is not only used for drinking, but we also use water to travel and to navigate. Water is also related to trade and economy. Indeed, everything happens around water.

Now, I will move on to the second category: Necessity of Water. Madam Chair mentioned in her introductory speech that water is 65 percent of our body, but let me break that into details. Intracellular water accounts for 40 percent of our body weigh. Intercellular water accounts for 20 percent. In our blood, we have 5 percent, totalling up to 65 percent. This is the liquid part of our body. If our body is thrown into the water, and if we stay still, we should float. But if you get panicky and say "I am going to drown," then you will drown. If you are quiet and calm in the water, because the volume is one to one, you can actually float. If you go into a salt lake, salt content is so high that you can never drown even if you wanted to. But you do not have to go to a salt lake to float. Even with ordinary seawater, we can float.

Water inside our body, as Madam Chair mentioned, actually helps to digest food, transport it into our body and excrete. Water also helps to circulate blood and other liquid and adjust our body temperature. Theses are the roles of water contents of our body. We take in water by drinking water, beer and other liquid, which we often take with our meals, and water is taken away from our body as we urinate and sweat; kidney plays a central role in this excretion process. Also, we breathe water vapour in our breath, and we exhale it. Such are the ways in which water is either absorbed or excreted from our body. In order to maintain our life, a person should drink 2 to 2.5 litres of water per day.

In our daily life, how do we use water? We use water for cooking, laundry, bathing, cleaning, washing, drinking, extinguishing fire, and also for industrial purposes. We have diverse ways in which we use water in our daily lives. With the modernisation of our lifestyle, the water consumption increased dramatically--it is more prevalent in bigger cities. In Japan, for instance, in 1970, per capita water consumption was 351 litres a day. In 1999, per capita consumption increased to 383 litres a day. Over these 30 years, the consumption increased by 10 percent.

The next topic is hygienic significance of water. The first item concerns oral infection due to water. We have typhoid, dysentery, cholera, infectious diarrhoea, infectious hepatitis and also some other diseases that are transmitted orally. The second item under this topic concerns the so-called Mills-Reincke's phenomena.

In 1893, two same phenomena were observed in the United States and Germany, discoveries were made by two doctors, Dr. Mills and Dr. Reincke, thus it is called the Mills-Reincke's phenomena. In the United States, Dr. Mills of Lawrence, Massachusetts, filtrated water and supplied it for the first time. As a result, the number of deaths caused by typhoid decreased dramatically. Moreover, natural deaths also decreased. At that time in 1893, people did not know about diseases that river water would transmit, thus they were surprised by this phenomenon. In the same year in 1893, in Germany, Dr. Reincke also filtered the water of the River Elbe and supplied it to Hamburg. Again, very surprising results were obtained; Typhoid decreased, and so did gastroenteritis. Especially, infectious diarrhoea among children sharply declined. This was the greatest discovery in public health—necessity of filtration and water supply was explicitly proven by these phenomena.

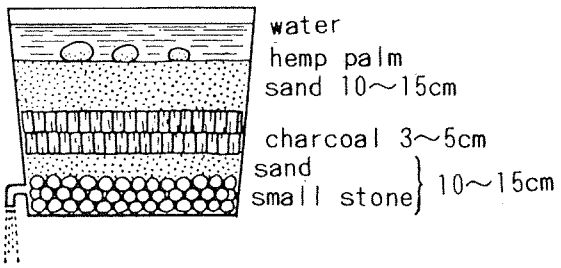
The next topic is drinking water. The first item under this topic concerns filtration. With filtration, we can actually eradicate 99 percent of the bacteria in water. And why is that?

On the very top layers we have sand, small rocks and big rocks. When water goes through this filtration, you get impurities on the top level, which is called the vital layer. With this vital layer, 99 percent of the bacteria that comes through will actually be filtrated. Thus, filtration alone will be quite sufficient, but we still have 1 percent of danger.

There are two filtration techniques: a slow filtration and a rapid filtration. If you have a large amount of land, we can have the slow filtration method, using the filter bed. We need a very huge filter bed to execute the slow filtration. In a densely populated area, we will have to use the rapid filtration method, in which we use aluminium sulphate to concentrate the impurities in the water.

On the outline, I have written about the Hanover fever incident occurred in 1926, in which 2,500 typhoid patients were found in Hanover. But before that, 25,000 people were infected by enteritis with fever, and E coli and other unwanted bacteria were the causes of this incident. The Hanover fever was also called as "tap water fever," because the disease was actually channelled through tap water. From this incident, people came to realise that they needed to chlorinate the tap water used for drinking to be disinfected. Today, we know that, with chlorination of 0.1ppm minimum, the water would become totally safe.

What should people do in small local villages and towns where they cannot to filter their water on a large scale? In remote areas and agricultural villages, this is what they use.



supplement:

simplified domestic water filtration device

fig.1-1

In the picture above, you see a simplified domestic water filtration device. On the top layer, we have a hemp palm. The top layer is the first filtration stage of the water, called the vital layer. Below the top layer, there is a layer of sand (10 to 15cm), followed a layer of charcoal, (3 to 5 cm) and once again, we have a layer of sand and small stone (10 to 15 cm.) Such is the simplified domestic water filtration device that they would use in remote agricultural villages and small cities.

When we use this simplified domestic water filtration device, we get 99 percent of filtration effect so that water obtained will be transparent. However, there still remains one percent risk

of infectious diseases, thus, we need to use a disinfection method. We may use chemicals to disinfect; however, if we do not have necessary chemicals, we will have to boil the water, which will make the water safe to drink.

Now, I would like to move onto the next category, "Rise of a Sense as a Developing Country." Under this category I have listed "Fall of the Berlin Wall." What do we mean by "Rise of a Sense as a Developing Country" and " Fall of the Berlin Wall?"

The concept of "developing nation" has come to light after World War II. It was on November 9th 1989 that the Berlin Wall fell. This was also around the period when the global community started to address this question of north versus south and the problems inherent in the developing countries. As the example of Japan shows, there is a distinct difference in terms of hygienic indicators before and after the World War II. If one looks at 1950 to 1955, during the first 5 years after the war, one will notice that the fertility rate, the mortality rate, and the infant mortality rate all declined dramatically. During these 5 years, Japan started to become a member of advanced nations.

The second point concerns the medical viewpoint. What were the medical challenges in those days? North-south issue of the economic discrepancy has given rise to the question of poverty, and there are many poverty-caused problems. From the medical viewpoint, I shall expand on this by using this vantage point to conduct the analysis. They are major hygienic indices that help us to make comparisons between the developed and developing nations. You will note that fertility, mortality, infant mortality and mortality rate of children under age 5 are very significant indices. UNICEF is an advocate of the need to look at the mortality rate of children under age 5, or U5MR.

The income of the household, nutrition, the availability of health and medical services, the availability of water, and the academic and educational background of parents all have implications on U5MR. Thus, UNICEF advocates the use for U5MR per one thousand births for analysis. In many developing nations, there is no established registration system for births and deaths; thus, one can only infer U5MR. According to some statistics, in 1988, pneumonia accounted for 28 percent of deaths, and 10 years later, in 1998, this percentage decreased to 18 percent. Diarrhoea-related diseases decreased from 23 to 17 percent. Those diseases that could be prevented by vaccination were reduced from 16 to 15 percent. Therefore, all those fatal diseases have declined during the 10-year period. Diarrhoea-related diseases were the number one cause of death among children 20 years ago. Although it gradually went down, diarrhoea-related diseases are still among the top 3 causes of death among children.

I looked into infant mortality rate, or IMR in short, which is on the Y axis, and I tried to look at the correlation by placing different parameters on the axis. The data is taken from the status of world children in 2001. I have placed the data for all the countries that are represented here today.

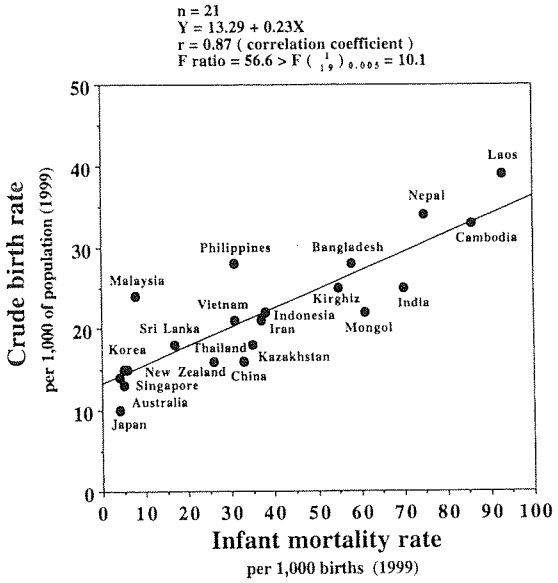


fig.1-2 Correlation between Infant Mortality and Crude Birth Rate

If you could refer to Figure 1-1, we have the infant mortality rate per one thousand births on the horizontal axis, this is the data from 1999. The vertical axis shows the crude birth rate per one thousand population, as of 1999. What can we find out? We can see that the more you go to the right, the infant mortality rate increases. So, in this figure, you see an orderly correlation. From this figure, we can assume that if you want to reduce the birth rate, the infant mortality rate should be reduced. There is a positive correlation with "N" equals 21(which is the number of countries represented here today,) and "r" the correlation coefficient is "0.87." ("1" is 100% correlation, "-1" is reverse correlation. "0" means no correlation.) In this figure r is positive number of 0.87, which means that there is an orderly correlation. So higher one parameter goes, so does the other parameter, and "r" is very close to 0.9, so there is a very high degree of correlation between the two factors. Also, the F ratio is 56.6. "F (1 19)" in the parentheses means the F ratio, and it is "0.005." It suggests that there will be a correlation at 0.005 percent level. So if you look at the correlation between the crude birth rate and infant mortality rate, there is a positive correlation at this point.

Let us turn to Figure 1-2. On the horizontal axis, we have the infant mortality rate per one thousand births. On the vertical axis we have the female adult literacy rate. In this analysis, female above the age of 15 is considered as "female adult."

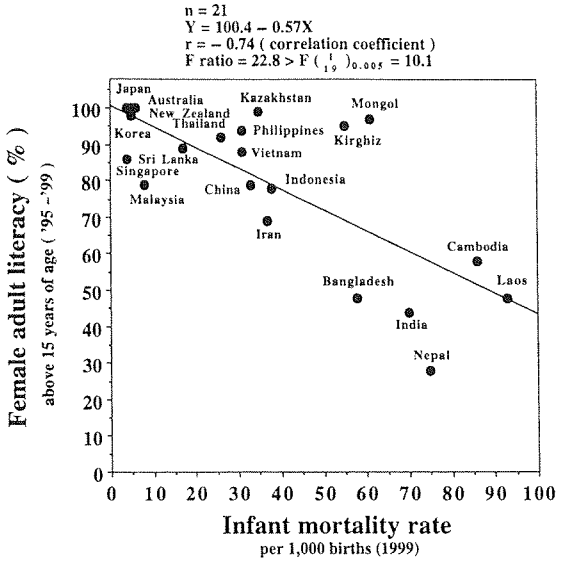


fig.1-3 Correlation between Infant Mortality and Female Adult Literacy

In this figure, you see that the higher the female adult literacy rate, the lower the infant mortality rate. Thus, we can conclude that there is a reverse correlation, and "r" has a negative value. So the higher one value becomes, the other value becomes lower. We look at the literacy rate as an indicator of the level of education. If the literacy rate is higher, then the infant mortality rate goes down. "F ratio" is 22.8, and between F 1 and 19, there is a significant level of 10.1, which means that there is a strong reverse correlation.

Going to Figure 1-4, again we have infant mortality rate on the horizontal axis. On the vertical axis, we have the safe water utilisation rate.

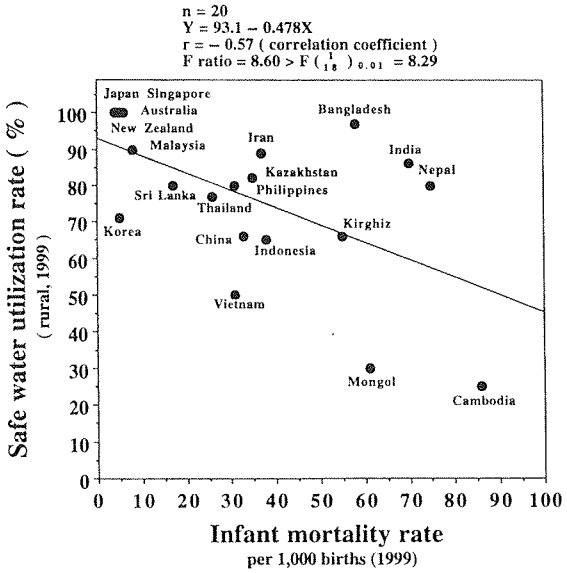


fig.1-4 Correlation between Infant Mortality and Safe Water Utilization

What do we mean by safe water utilisation rate? The safe water utilisation rate in this figure is the portion of people that have access to safe water. The more people can enjoy the supply of

safe water, the lower the infant mortality rate gets. If they do not have access to safe water, there is a higher mortality rate among infants. The figure shows a reverse correlation with r= -0.57, which is weak correlation compared to the previous chart. There is some correlation, but it is far from a perfect correlation. Also, the significant level is one percent.

Before I close, I would like to draw some conclusions. Firstly, why is there a correlation between the infant mortality rate and the crude birth rate? The following explanations can be said; the crude birth rates are high in countries with a high infant mortality rate, because infants die frequently and parents are fearful of losing their potential labour force. They want to secure sufficient number of young workers, thus, they give as many births as possible. By doing so, they hope to have some members of their family surviving even if other die along the way. When there are too many family members; however, they will have to leave their home and move to metropolitan centres in search for jobs. Often times they end up living in the ghetto and gutters.

Secondly, if you look at the female adult literacy rate and infant mortality rate, I conducted a similar analysis 10 years ago and got a significant correlation; one must not rush and conclude any causal relationship in the two. When we regard the relationship between infant mortality rate and nutrition, pneumonia, bronchitis, diarrhoea, enteritis and other diseases (these are the major cause of infant mortality) and to reduce the infant mortality rate, education of mother, i.e. increase adult females literacy, is important, and it must also include family planning education for this is a very important perspective as we design a better population and development programme. In other words, I am emphasising the need of education of women to reduce the infant mortality rate.

Thirdly, in regards to the availability of safe water and infant mortality rate, again, one should not jump into conclusion of causal relationship. Correlation does not necessarily indicate that that is the causal relationship. It does not necessary mean that one phenomenon causes another. I think you will be persuaded by the first correlation, and may think that there is a cause and effect. With the second one, you may also be convinced as well. But what about the third figure, about the relationship between availability of safe water and the infant mortality rate? "r" is "-0.57," which is about half, so there is significant reverse correlation. One cannot conclude that there is a causal relationship, but I believe that there is room for logically accepted interpretation--that it may help to decrease the infant mortality rate, if we provide safe water to a greater percentage of population.

The conclusions drawn from my analysis are shown here under the heading of "Summary."

Supply of safe water
Improvement of female adult literacy

Both are relevant to the reduction of infant mortality rate. Providing literacy education to adult females would help to reduce the mortality rate. If the infant mortality rate goes down, the crude birth rate may be reduced; therefore the population growth may slow down. I have tried to share with you some of my logics and observations, and with these analysis, I would like to conclude my presentation.

Thank you very much for giving me this opportunity to share with you my academic thoughts.

Discussion

DR. MALINEE
Thank you Dr. Takakuwa. That was a very interesting presentation. I will not draw any conclusion or make comments on that, because you have prepared it so well. Now, I think it is time for us to have some discussion from the floor. Do you have any discussion or any questions you would like to ask Professor Takakuwa?

MR. LI HONGGUI
I am a M.P. from China, Li Honggui. The speech made by the professor just now was very good. Water has very close relationship with public health, because water is a very important element that human body needs. On the first hand, human body needs good amount water. As the professor put it, our human body needs at least 2,500 ml of water a day. On the other hand, we need good quality of water; that means we need safe drinking water. If water lacks essential mineral, it is not good water. Also, if the water is polluted, it may cause infectious diseases like diarrhoea. In the 1950's, when I was in university, I heard that in Japan there was some infectious disease that was caused by mercury pollution; it was called Minamata disease. I do not know whether you still have this disease nowadays in Japan.

There are reports about a Chinese village where male sperms were greatly infected by the water polluted with some metal, and the male reproductive ability deteriorated. Therefore, the village was called the "widow village."

Also, as the professor put it, water has very close relationship with infant mortality etc. Thus, we mist take some measures to protect safe drinking water. I would like to highlight the following four points:

First, we should take measures to inform the public about the close relationship between safe drinking water and our health.

Second, we should accelerate water management system to protect water sources.

Third, we should inform the public that underground water is favoured, because we all know that underground water is less polluted. If we drink water on land, we should disinfect it.

Fourth, we should build some dams and carry out land conservation. The suggestion made by the professor this morning, that we should set up some international organisation to work coherently on the water issue--I think this suggestion is very good. Thank you very much.

DR. MALINEE
I think we will ask the questions first and come back to answer them later. Indonesia, please.

DR. CHANDRA
I am Surya Chandra from Indonesia. You mentioned that correlation does not mean cause and effect. But, if you look at Figure 2 and Figure 3, three countries, Bangladesh, India, Nepal

have high infant mortality rates with low female illiteracy and high safe water utilization rates. From these statistics, can we conclude that low female adult literacy is more important than high safe water utilization?

The second question is how the fall of the Berlin wall is the indication of the developing countries. Thank you.

DR. MALINEE
The comment from His Excellency Li Honggui was that he agreed with you and had a little comment on the four points. His first question was about the mercury infection in your country. Also, do you know anything about the metal pollution in water causing the sperm deterioration among men? If you could answer these questions, I think the world will learn a lot.

Dr. Chandra from Indonesia was concerned about the infant mortality rate and its correlation with female literacy, and about the Berlin wall.

DR. TAKAKUWA
Currently, there is no mercury poisoning in Japan. It has been completely resolved except for legal and compensational issues. This was caused by industrial waste out of the factories, which poured out into the sea, and fish drank the seawater. By eating polluted fish, through the food chain, people got poisoned.

All industrial pollutions depend on what is really discharged, so we have to really analyze what is discharged. Then, we have to prevent any of these discharges of substances that cause industrial pollution. This is not only relevant in Japan, but it refers to the whole earth.

I am afraid that you are wrong to say that underground water is good, because everything permeates and reaches underground water as well. Even if the well water seems cleam and safe, it may not be safe, because everything permeates into the soil. Thus, we do not know what goes into the underground water. If you are going to use underground water for drinking, we must test it first. There is a standard examination for drinking water, and we must look at the testing results to see if the underground water meets the criteria.

As for the effect of water on reduced sperm count, lately, the world has been concerned with the effects of environmental hormones such as dioxin. When we burn something and dioxin is created as a result. This dioxin is damaging to the environment, and we can get this environmental hormone from both the soil and the atmosphere. This is not only limited to Japan but is happening all over the world.

DR. MALINEE
You have comments on that?

DR. POMPICH
I am Dr. Pompich Patanakullert from Thailand. The cause of reduced sperm is one issue in reproductive health relating to men. I think the pesticides from agriculture are the cause of reduced sperm count.

DR. MALINEE
You mentioned about insecticides, right? How about from New Zealand?

MS. BUNKLE
I am Phillida Bunkle from New Zealand. I wanted to comment on the issue of the pollution, about the ways in which we are actually all beginning to share the pollution. The Minamata Disease, which was the disease associated with mercury, has been resolved in Japan. However, the Food and Drug Administration in the United States currently recommends that pregnant women should not eat more than one serving of fish per week, because of the possible mercury content of the fish. So now, Minamata may not have an issue, but the whole world has an issue in terms of the concentrations of mercury in the ocean, and it is beginning to affect us all.

Also, I want to comment on the dioxin issue. Dioxins are produced through a great variety of industrial processes, and they not only affect the male sperm, but they affect female fertility as well. Even in a clean country like New Zealand, of dioxin are affecting animals and an epidemic of endometriosis are reported. This is affecting the whole reproductive tract, not only of people, but also of all animal kingdoms, because we did not understand the concept of bio-concentration. What happens with bio-concentration is that contaminants concentrate up the food chain. Thus, the more fat you eat, the greater concentration of dioxins you intake, since dioxins concentrates in the fat tissues. But the point I'm trying to make is that we share this. Studies found that even the polar bears in the Arctic, which live in the cleanest environment, have so much dioxin in their fat tissue that it is affecting their ability to reproduce. The point that I am making is that none of us are free problems of pollution. We all have an interest in this fact. Do you remember the Greenpeace slogan that said "There is no 'away'"? When we throw it away, it ends up in the ocean and we all share the ocean. So we all need to be alert about what we are discharging into ocean. Thank you.

DR. MALINEE
Everything is connected to each other. Dr. Shankar, you may repeat your question slowly so Dr. Takakuwa will get it and answer you correctly. Again please.

DR. CHANDRA
You mentioned that correlation does not mean cause and effect. But in Figure 2 and Figure 3, three countries, Bangladesh, India and Nepal have low adult female literacy rate, but they have high safe water utilisation, and they all have high infant mortality rate. From these two statistics, can we decide that adult female literacy is more important than high safe water utilisation to make high infant mortality rate?

Second question: Could you explain the fall of the Berlin wall being an indication of the rise of the sense of developing countries? Thank you.

DR. TAKAKUWA
The fall of the Berlin wall... I just caught it. It was something that I read. Chronologically, fall of the Berlin wall happened at time when we had seen the visible discrepancy between the north and the south, because before that, the tension was focused on east and west relationship. But when the cold war ended, attention went to north and south relations. Before it was the ideological confrontation between the east and the west, but now, the ideological confrontation is gone, and people are now able to give more attention to economic aspects. The collapse of

the Berlin wall did not cause this shift, but around that period of time, people started to fully realize that there was indeed an economic gap between the north and south. Maybe I did not explain well and have misled you, but that was what I intended to say.

On your next point about the literacy rate and safe water utilisation rate, literacy rate data is limited. And, of course, what they suggest is not straightforward. What is the definition of "literacy rate" to begin with? If one can read, that is "literacy," but this is a very ambiguous area in terms of definition and statistical accuracy. I am not privy to how they have come out with this literacy data, but I just rely on this statistics to you the numbers. If we are to compare the two, I cannot say which is more important than the other. But my underlying message is that you have to educate women and attain high literacy. If they cannot read and write, they tend to forget what they are told. If they can write down and read them, they can maintain what they have learned. Thus, literacy is very important to have an effective education. What I have tried to emphasise is that the higher the literacy the better. This does not have a direct bearing on the availability of safe water. Safe water is more of a political issue. In the rural areas, the availability of water will have to be made possible by individual families. Thus, we are really talking about two different things. Just like one cannot compare oranges with apples, we can not compare the female adult literacy rate and the safe water utilization rate on the same ground. But, we can say that family planning education is important, and to be able to read and write would be essential. I could have just shown you something on the screen, and without any handouts, you may forget it. But, if you have this hard copy material, then you can come back to this anytime. Because you are literate, you can come back to this and have your version of understanding and analysis. That is what I mean by literacy, and I do not intend to find any relationship between literacy and safe drinking water.

DR. MALINEE
The Philippines, please.

PHILIPPINES
What I am worried is the chemicals we put to the water in order to make it safe. Isn't there a long-term effect of chlorine or whatever we use to purify it? I do not know if you could use something else besides chlorine, and if so, don't they have a long-term effect if we continue to use them?

DR. MALINEE
If we use chlorine over a long-term, is it harmful?

DR. TAKAKUWA
Yes, the question that you raised is very important. The practices of the major cities of the world prove that residual chloride of 0.1ppm is safe. Of course, if you put 10 times more of what you need, it may be hazardous, but as long as you maintain the established rule, I think it will be all right. Currently, dentists use fluorine to prevent dental caries, but fluorine has side effects. Thus, it is a very sensitive issue. One always has to continue to analyse and be careful about side effects of these chemicals. However, when it comes to chlorination, I think it is a proven technology that is used by many countries and proven to be safe. If you do not want to use chlorine, then you should boil water. If you boil the chlorinated water, you can get rid of chlorine. Thank you very much.

SESSION II

"Irrigation and Rural Issues"

"Irrigation and Water-borne Disease in Agricultural Development in Asia"

Dr. Nobumasa Hatcho
Professor, Kinki University

Food Production and Agricultural Development in Asia

After the World War II, Asia was faced with the dooming prospects of food supply with high population growth and growing starved populations. For many Asian countries, the expansion of food production means increases in rice production, mainly through the expansion in irrigated areas. Rice is grown in about 150 million ha of land worldwide, out of which 91 % is produced in Asia. Many Asian small farmers modified rice cultivation environments to increase the yield of rice corps through such measures as the control of water depth, stabilization of water supply, drainage, inputs, and mechanization, etc. Modernization of agriculture has proceeded with the development of high-yielding varieties, combined with high fertilizer/chemical application and irrigation development. The progressive increase of food production is called "Green Revolution", and resulted in increase in per capita food supply and decrease in starving population in Asia.

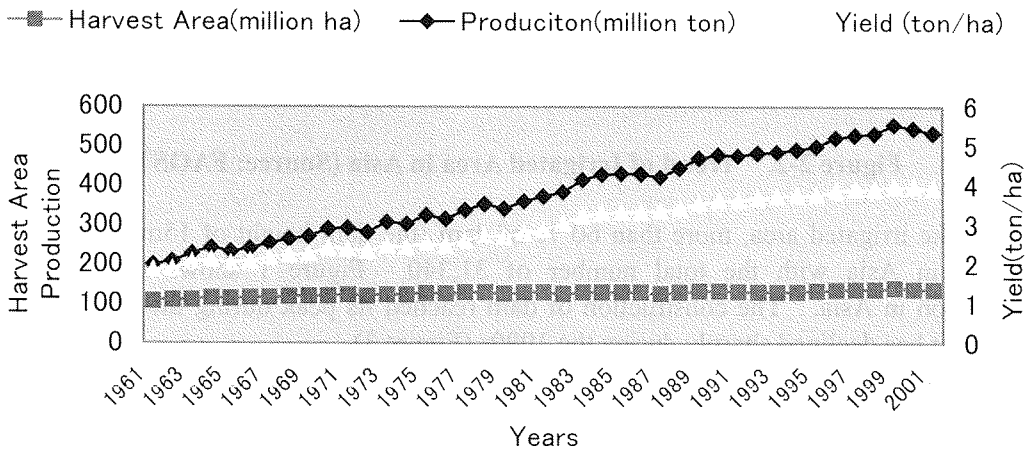


Figure 2-1. Rice Production in Asia (Source: FAOSTAT)

Major cereal production has increased from 340 million ton in 1961 to 930 million ton in 1998, with the annual growth rate of more than 3 percent, which exceeded the population growth rate. With the increase of food production, the number of malnourished in Asia has decreased from about 750 million in 1970 to 620 million in 1990, and expected to decreased 270 by 2010 (FAO 1993). The share of agricultural land area of Asia in the world is only 31 percent, however, Asia supports 54 percent of the world population, which shows the high productivity of Asian agriculture, particularly the one of paddy field irrigation. However, we are confronting such difficult issues of water scarcity, degradation of land resources, and global environmental problems such as global warming, which necessarily lead to unstable factors for food supply.

Irrigation Development in Asia

Irrigated area in Asia in 1961 was about 90 million ha (the irrigated rate of about 21%), and it expanded to 134 million ha (29%) in 1981 and 193 million (35%) in 1999 (Figure 2-2). About 70 % of world irrigated land exist in Asia, and the irrigation rate is much higher than the world average of about 20%. Double or multiple cropping of rice is widespread in the tropics where irrigation water is available; however in subtropics it is limited because of temperature constraints.

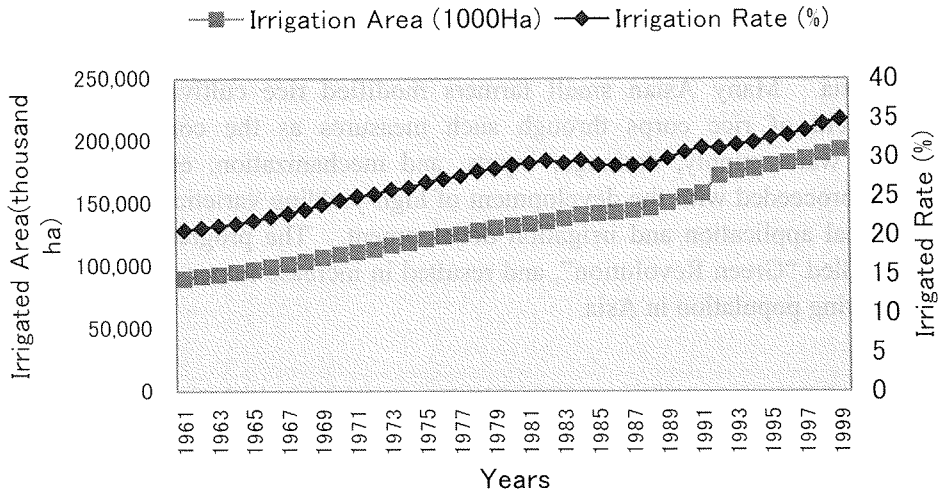


Figure 2-2. Trend of Irrigated Area in Asia (Source: FAOSTAT)

As with the irrigated area, more than 60 % of dam (the dam height of 15m or higher) of the world is in Asia with the total number of 31,340. Figure 1 shows the trend of dam construction in Asia. The construction of dam reached its peak during the 1970s and 1980s, however, it has declined sharply during the 1990s (Figure 3).

Nearly one half of dam in the world exist in China (22,000), and most of them are constructed after the 1950s. Characteristics of dam construction in Asia are that many dams were constructed during the 1970s and the 1980s and their purposes were mainly for irrigation (ICOLD 1998). Dam construction for water resources and irrigation development, which enabled the rapid production expansion and productive agriculture, now faces difficulty due to its environmental and social impacts (relocation of habitants in reservoir area) as well as rising costs and diminishing profitability. As a result, recent developments focus more on the rehabilitation and improvements of operation and management of existing irrigation systems.

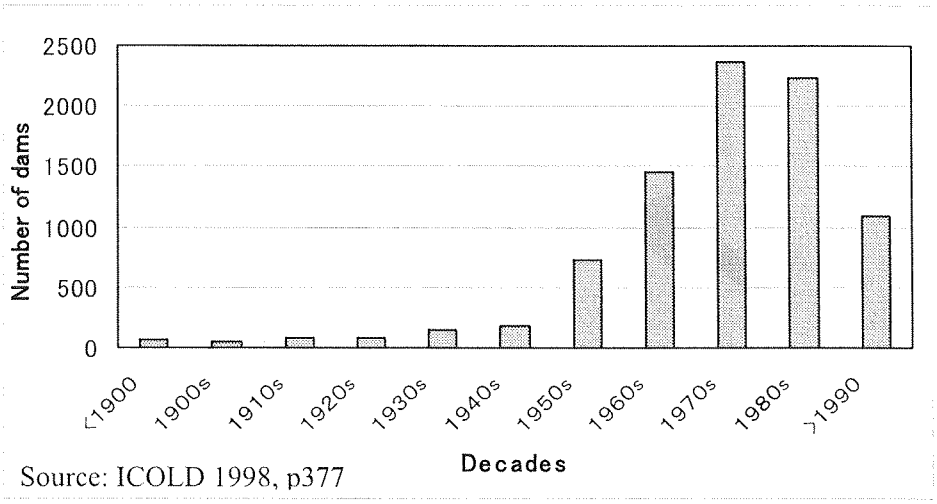


Figure 2-3. Trend of Dam Construction in Asia

Water-borne Disease Problems

In addition to the benefits derived through irrigation development such as an increased availability of food and income, negative impacts associated with irrigation development are reported such as water-logging and salinisation, water pollution through the application of fertilizer and chemicals, drying up of river flow such as the Yellow River, and the expansion of water-borne disease and associated health damages. Irrigation developments have often created favourable conditions or environments for transmitting water related vector-borne diseases such as malaria, Japanese encephalitis, filarias, schistosomiasis (bilharzias), etc. These are parasitic diseases that are transmitted by a vector (mostly mosquitoes) or that have an intermediate host (snail for schistosomiasis) that is dependent on water for its development. Averting the transmission of water-borne diseases and the spread of vectors are needed. It is also important that we prevent further vector production through appropriate environment and water management while minimizing the reduction of production level at the same time.

The infection rate of schistosomiasis is said to have increased from 6% to 60 % in part of Upper Egypt three years after the construction of Aswan low dam in the early 1930s. As well, the infection rate of irrigated project area in West Africa was 59.2 % compared to river communities' 10.9 % (FAO 1997)

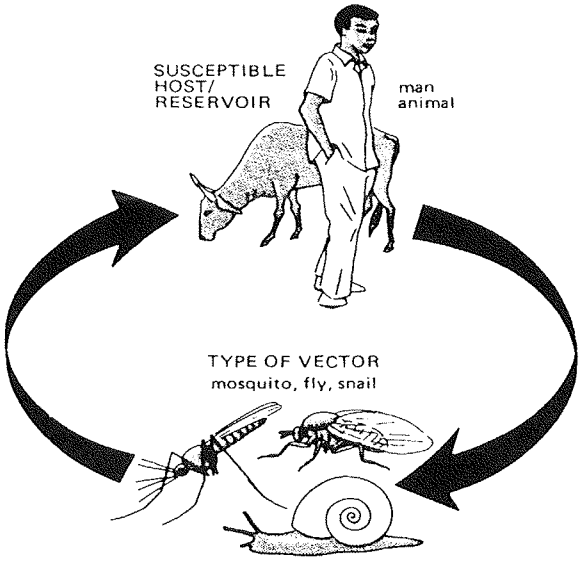


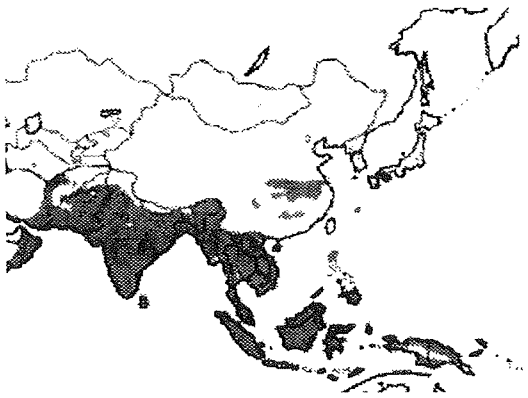
Figure 2-4. Transmission Mechanisms of Infectious Diseases (Source : Health and Irrigation p.25)

The situations of water-borne disease in Asia and possible counter measures are described in the following sections.

Malaria

Among the vector-borne disease, malaria is the most popular and the most serious. The number of infected patients totalled about 300-500 million in more than 90 countries in the world, and more than million people died. Ninety percent of the patient is in sub-Saharan African countries but in Asia, the infection is observed in India, Sri Lanka, Indonesia, Laos, Malaysia, Vietnam, Cambodia, the Philippines, China, and Papua New Guinea.

Increased risk of the disease is linked with changes in land use linked to activities like road building, mining, logging and agricultural and irrigation projects, particularly in "frontier" areas like the Amazon and in South-East Asia. Other causes of its spread include global climatic change, disintegration of health services, armed conflicts and mass movements of refugees. The emergence of multi-drug resistant strains of parasite is also exacerbating the situation. Via the explosion of easy international travel, imported cases of malaria are now more frequently registered in developed countries. Malaria is re-emerging in areas where it was previously under control or eradicated e.g., in the Central Asian Republics of Tajikistan and Azerbaijan, and Korea. More than any other diseases, malaria hits the poor. Malaria endemic countries are some of the world's poorest. Additional burden to these countries caused by Malaria include cost for control and lost workdays - estimated to be 1-5% of GPD in Africa. For the individual, costs include the price of treatment and prevention, and lost income. Rural communities are particularly affected. In rural areas, the rainy season is often a time of intense agricultural activity, when poor families earn most of their annual income. Malaria can make these families even poorer. In children, malaria leads to chronic school absenteeism and there can be impairment of learning ability (WHO).



Source: www.med.kyushu-u.ac.jp

Figure 2-5. Distribution of Malaria Patients in Asia

The increase of malaria incidents is reported with the expansion of irrigated area. In India for example villages along irrigation canals show 6-9 times higher rates of malaria infection that those 40 km away. Construction of 25 large and medium-sized dams in the Indus River Basin Irrigation Development Project in Pakistan resulted in a sharp rise in malaria infections. Even in Japan malaria had been a serious disease, and the disease was eradicated after the World War II. For example, malaria (Okori in Japanese) was prevalent around Oguraike pond in Kyoto prefecture, and in 1930 it became endemic with the infection rate of one out of 8 persons. It was finally eradicated when the pond was reclaimed for agricultural land.

The population of infected area in the western pacific region (except for India and Sri Lanka) is about 1.5 billion, and about 7% of the population is at the risk of infection. The number of patients in 1998 was 0.4 million, which had reduced significantly from 1.4 million in 1984. High rate of infection per 1,000 is reported in Solomon Islands (175), Banuatu (34/1000), Laos (8), and Cambodia (6). (Homepage of WHO).

Drug resistance in the parasite and vector resistance against insecticides pose serious problems, and hamper the control of malaria transmission. In India, the use of DDT has started in 1946, and in 1959 the resistance against DDT was reported. In 1996, the one out of six transmitting mosquitoes have tolerance against DDT in 18 states and 226 regions in India. In addition, the use of insecticides such as DDT and BHC poses the threat of environment pollution and bio-accumulation.

Table 2-1 shows the percentage of population living in malaria risk areas in the Western Pacific regions. There is wide variation; from the very small proportion of the huge Chinese population identified as being at risk for malaria to the entire population of the Solomon Islands.

Table 2-1: Population at Risk for Malaria and Total Population

Country	Population risk Malaria	at Total Population for (1998 estimate)	% of population at risk
Cambodia	2 500 000	10 718 000	23.3%
China	37 100 000	1 223 890 000	3.0%
Lao PDR	3 659 873	5 163 000	70.9%
Malaysia	2 143 923	21 410 000	10.0%
Papua New Guinea	4 400 000	4 600 000	95.7%
Philippines	11 336 945	72 944 000	15.5%
Republic of Korea	1 917 635	45 093 000	4.3%
Solomon Islands	417 000	417 000	100.0%
Vanuatu	176 927	182 000	97.2%
Vietnam	34 700 000	77 562 000	44.7%
Total	98 352 303	1 461 979 000	6.7%

Source: www.who.org.ph/

Table 2-2: Confirmed Cases, Incidence per 1000 Total Population, and Deaths (1998)

Country	Confirmed Cases	Incidence/1,000 Population	Total Deaths
Cambodia	66 140	6.17	621
China	27 100	0.02	24
Lao PDR	41 600	8.06	485
Malaysia	13 500	0.63	27
Papua New Guinea	20 900	4.54	657
Philippines	50 700	0.69	(1996) 262
Republic of Korea	3 992	0.08	0
Solomon Islands	72 800	174.58	33
Vanuatu	6 200	34.06	0
Viet Nam	72 100	0.93	183

Source: www.who.org.ph/

Confirmed cases of malaria have declined significantly from 1.4 million in 1984 to less than 400,000 in 1998. Similarly, the malaria death also declined from about 6,000 in 1992 to about 2,200 in 1998.

Japanese encephalitis (brain fever)

The disease is closely related to rice production and mainly found in South, South-East, and East Asia. It occurs in epidemic outbreaks with high mortality rates among children. Pigs are the main amplifying host of the virus, and migratory birds are suspected to play a role also. Mosquito vectors breed primarily in rice fields in temperate and tropical zones. There is no drug treatment for Japanese encephalitis, and vaccination is the single most important control measure. With the introduction of vaccination, the cases of Japanese encephalitis in Japan, for example, has declined from more than 1,000 before 1967 with a fatality rate of about 30% to 44 cases in 1987, and only 6 in 1999 with no fatality. Similarly, China and Republic Korea, the

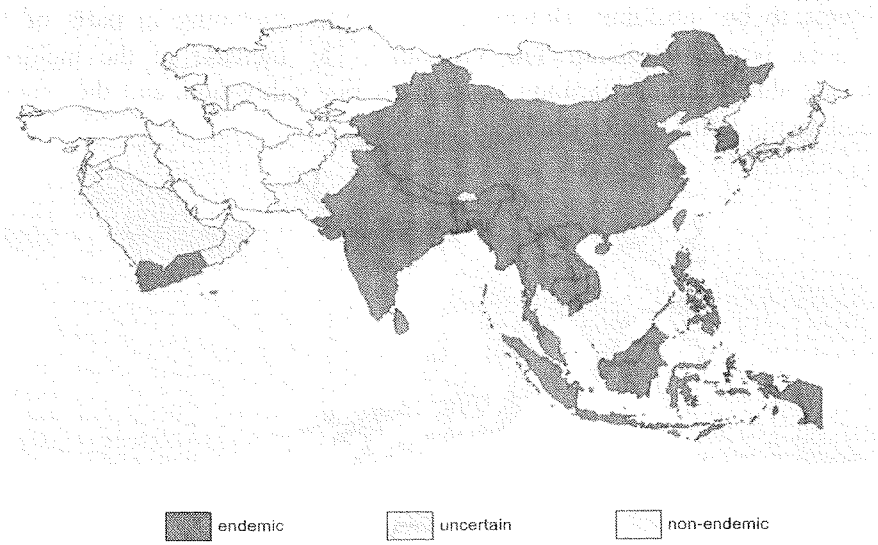
infection seems to be subsiding. However, it has been spreading in parts of Bangladesh, Myanmar, India, Nepal, Thailand, and Vietnam. The increase in the incidence can be attributed to the shift from dry farming to irrigated rice cultivation, and the establishment of large and modern pig farms. (IRRI 1988).

Figure 2-6. Distribution of Japanese Encephalitis

Filariasis (elephantiasis)

Lymphatic Filariasis puts at risk more than a billion people in more than 80 countries in the world. Over 120 million have already been affected by the disease, and over 40 million of them are seriously incapacitated and disfigured by the disease. One-third of the people infected with the disease live in India, one third are in Africa and most of the remainder are in Asia, the Pacific and the Americas. In tropical and subtropical areas where lymphatic filariasis is well-established, the prevalence of infection is continuing to increase. The disease is caused by thread-like, parasitic filarial worms that live almost exclusively in humans. These worms lodge in the lymphatic system, the network of nodes and vessels that maintains the delicate fluid balance between the tissues and blood, and which is an essential component for the body's immune defence system. In its most obvious manifestations, lymphatic filariasis causes enlargement of the entire leg or arm and the genitals. In endemic communities, 10-50% of men and up to 10% of women can be affected. Even more common than the overt abnormalities is hidden, internal damage to the kidneys and lymphatic system caused by the adult worms, and the disabilities caused by the disease have considerable economic impact on affected communities. The psychological and social stigmata associated with these aspects of the disease are immense too.

The number of patients has decreased significantly by the use of insecticide such as DDT. The infected patients were reported to be about 10 million in the West Pacific regions in 1983, but reduced to be 3.1 million in 1991. China in particular, 30 million patients were reported in 1950, but it was only one million in the 1994-1997 period. After China, Vietnam with 0.5 million and the Philippines with 210 thousand follow.



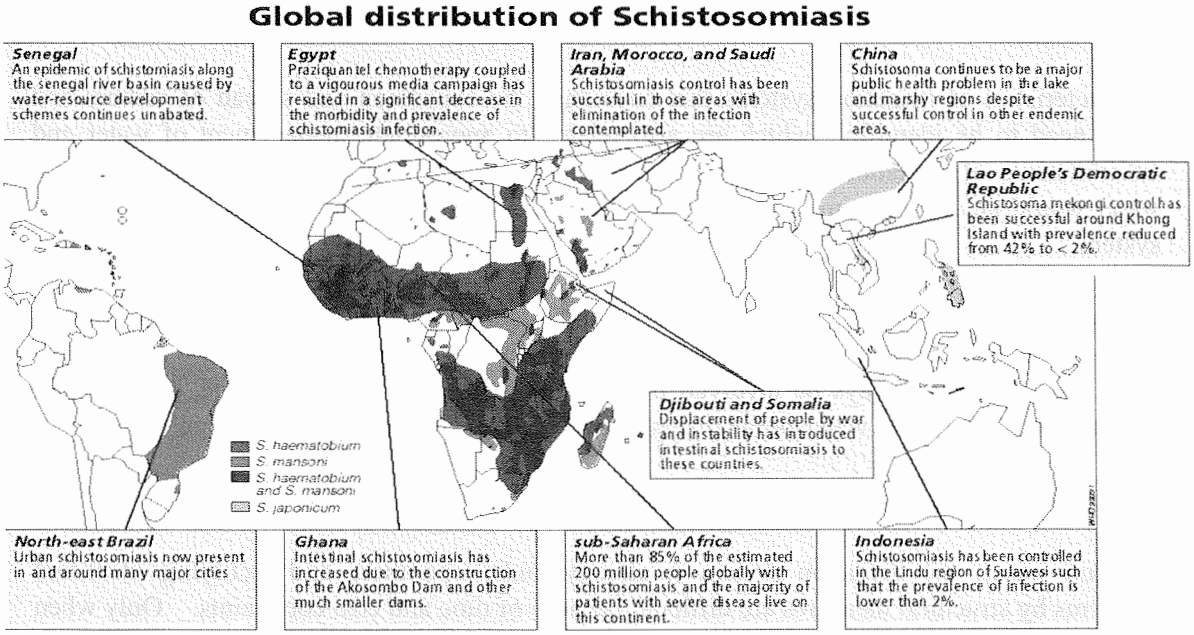
Source: www.who.org.ph/

Figure 2-7. Distribution of Lymphatic Filariasis in Asia (May 2000)

Schistosomiasis (bilharziasis)

Among human parasitic diseases, schistosomiasis (sometimes called) ranks the second, behind malaria in terms of socio-economic and public health importance in tropical and subtropical areas. The disease is endemic in 74 developing countries, infecting more than 200 million people in rural agricultural and peri-urban areas. Of these, 20 million suffer severe consequences from the disease and 120 million are symptomatic. An estimated 80% of all cases, and all of the most severely affected, is now concentrated in Africa. In many areas, schistosomiasis infects a large proportion of under-14 children, because they play in the water bodies. An estimated 500-600 million people worldwide are at risk from the disease, and about 20,000 die every year. Schistomiasis cannot be a direct cause of death, but it leads to a long-term damage to bladder, kidneys and liver. Adult parasite lives in the veins of mammals, and eggs are discharged in feces or urine. The larvae hatching from eggs in water enter into snail intermediate hosts and undergo asexual multiplication. The flukes infect humans when they exposed their skin in water by swimming, bathing or wading.

The global distribution of schistosomiasis has changed significantly in the past 50 years, with control successes achieved in many parts of the world. However, environmental changes linked to water resources development, and increasing population and population movements have led to the spread of the disease to previously low or non-endemic areas, particularly in sub-Saharan Africa. A few striking examples can be cited in this respect. The building of the Diama dam on the Senegal River has introduced intestinal schistosomiasis to both Mauritania and Senegal.



Source: www.who.int/cnd

Figure 2-8.

Schimatomiasis in Japan had been known since 1847, and was called Fuji. The infected area was limited at the time of 1948, but more than 50% of infection in the Chikugo River basin was reported. The eradication program started in 1950. In 1973, only 0.7% of the population in infected area showed positive, and after 1977, no patient has been reported. In China, the number of infected patients of 12 million drastically decreased to 860,000 in 1995 with eradication campaign. However, with the increasing sedimentation of rivers and lakes, the sign of prevalence is observed. In the Philippines, the infected rate of contaminated area was 7.4 % in 1986, but reduced to 4.5 % in 1997.

4. Control Measures and Sustainable Agricultural Development

With the introduction of DDT or other chemicals after the 1950s, the vectors and parasites have been controlled mainly by applying chemicals. Disease control heavily relies on chemical spraying, and the traditional method and knowledge of controlling vectors through environment management and inter-disciplinary cooperation have been lost. However, due to the contamination caused by chemicals and insecticide, and insecticide or drug resistance developed by vectors and hosts, environment control measures have been introduced again.

Risks of water-borne disease infection increase by the following factors including inadequate drainage in irrigated areas, introduction of rice or sugarcane farming with continuous flow of water, constructions of reservoirs (tanks), stagnant water of borrow pits left after canal or road constructions, seepage from unlined canal/tanks and resultant water pool, and improper management of vegetation in unlined irrigation canals. By disrupting the transmission mechanism, the infection can be controlled. Breeding habitats of vectors can be eliminated, and susceptible host can be made less susceptible by immunization, by using drugs, and by reducing the chance of contacts with the vector.

4.1 Environmental control during designing and planning stage

Characteristics of irrigation systems that encourage the expansion and spread of vectors and hosts need to be identified, which are also related to appropriate management of water and environments of irrigation systems. Prevention of creating stagnant water or slow-flowing water would be the most important consideration when designing and managing the irrigation system.

When systems are newly constructed or rehabilitated, incorporating environmental control measures in the plan and the design of structures/facilities are very important. In addition, local people should always be involved from the planning and designing stage, so that local mechanism of spreading water-borne disease can be fully incorporated in the design.

4.2 Environmental Control in existing system

In many cases, the irrigation system is already under operation, and rectifying identified problems by structural measures are difficult, because of time and cost constraints. Only when a major repair or rehabilitation is undertaken, modification of problems can be implemented. Canals have to be closed for the necessary measures, and costs are usually high for the work. Thus, in many cases, environment control measures taken in systems under operation are limited to those of improving or modifying irrigation management. Good irrigation management will eliminate conditions for vector breeding and spread of disease, and at the same time improve irrigation performance.

Water velocity and flushing

Intermediate hosts and vector mosquitoes prefer stagnant water. According to IWMI (1998), mosquitoes lay twice as many eggs in shallow water with 9cm compared to deep water of about 50cm. Mogi (1999) set 20cm/s as a criterion for controlling mosquitoes in channels in paddy fields areas. It would be difficult to increase the velocity under earth lined canals, however, by performing channel cleaning and removal of weeds or vegetation periodically, the breeding site of mosquitoes and snails can be controlled. Similarly, periodical flushing of channel are utilized in the Philippines, Sri Lanka, and India, to wash away the snails and mosquitoes out of the irrigation system.

Field water management

Flooded water on the rice fields can also be a good habitat for vectors. To control the vectors in rice fields, intermittent irrigation method has been developed and adopted in China (Boelee 2000). Instead of undergoing artificial drainage, the field is filled with shallow water layer which are subject to evapo-transpiration and percolation until water disappears, and then the field is flooded again. The process is repeated every 3-5 days. In addition to controlling vectors of malaria and filariasis, it also saves water. The method is now widely adopted in China for water-saving purpose. Feng et al (2002) reported that alternating wet and dry irrigation showed higher yields with less water, resulting in 25-45% higher water productivity than under continuous flooding.

5. Conclusions

In addition to the challenges of producing more food with less water, we have to face global environmental degradation, including global warming, accompanied by a big variation of environmental conditions. These variations can influence the existence and breeding of vectors that transmit diseases, leading to a possible breakout of the disease. For example, when the sea level rises with the global warming and the seashores become marshy, the impact on the breeding and prevalence of vectors and hosts will be enormous.

It is usually the poor and the weak including children and pregnant women in developing countries who suffer most from the disease. Opportunities for income and education are lost, and the vicious cycle of poverty further deteriorates. In addition, poverty leads to the malnutrition and poor health, which induce more infection and disease.

For the planning and implementation of water development projects, health impacts should be assessed from the planning stage, and necessary mitigation measures should be incorporated, with the involvement of users of local resources. The cost for mitigation is usually much smaller compared to the remedial costs required after the breakout of disease and infection.

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Homepages

(http://www.brown.edu/) (http://www.who.org.ph/)
(http://www.who.int/cnd) (http://www.med.kyushu-u.ac.jp/)

Discussion

MR. BHATIA

Thank you very much Professor Hatcho for your very important and comprehensive lecture. You referred to land areas and suggested that land is not increasing while population is increasing. The world has to cope with this problem by increasing food production.

He also emphasised the use of water and explained that management of water is a very serious problem for the world. He suggested that, since water sources are limited, desalinisation might be the answer for production of more water. He also explained about the water borne diseases and their remedies, which are enormous problems. The most serious problem that was brought to our attention was the progress in research in the stage of globalisation, in the stage of information revolution. In this age of science and technology, research is one thing that human society developed so far in the 21st Century. This is really very serious problem and since all representatives of the governments are here, I think we should take note of what professor has brought to our attention. It is a very important issue and we should try to help in our way in our own country.

But professor, before I finally thank you, I have a question to ask you. You said that so much pesticides and insecticides are being used, or other matters, for the production of greens and vegetables. Has any study been made on their effects on vegetables and grains and on human body? Because you input these chemicals, you get more grains and more production, but grains must be having some effects from this. I would also like to know how it is transmitted to human body. I would like to ask if you can shed some light on this.

DR. HATCHO

Yes, Mr. Chairman. Thank you for your question. For example, I mentioned about DDT, which is a very famous insecticide that is still used in some countries, I think. But according to a Japanese research, it accumulates, of course in the grain, and then finally into the human body. Pregnant women started to have their milk containing the effects of this DDT. It was a very serious problem, so in Japan, it is prohibited to use DDT, although it has very strong effect in controlling insects and other problems. I think it is a very serious problem. We have a representative from Indonesia today, and Indonesia used to use quite a lot of insecticides and pesticides for improving rice production. However, there was a sort of, as I said, a repetition cycle. They used insecticides but all these insects started to develop resistance. So they adopted a new approach of IPM, Integrated Pest Management. This is an approach that promotes more of traditional methods and minimises the use of insecticides. The approach includes education and training for farmers so that they properly observe all of these rice plants. If they identify the sign of a disease, they apply a minimum amount of insecticide. Previously, what they did was, according to the promotion by the commercial sector, they applied regularly and believed that larger amounts were more effective, thus, they applied more and more. I think quite a big amount of subsidy was provided to insecticides and fertilisers, but by adopting this IPM approach, they could also reduce the amount of subsidy. Thus, it became a win-win situation: reduction of subsidy and reduction of damages from insect diseases.

MR. BHATIA

Thank you very much professor. The discussion is open and I would like if there is any question from my friends. Professor would be glad to answer them.

MS. NAPSIAH

Thank you Mr. Chairman. I need some clarification. I am Napsiah from Malaysia. Recently, about a year ago, there was an outbreak of Japanese Encephalitis, we call it "JE" in a pig rearing area and not in paddy field. Within one week, the patients just died and entire families were wiped out. I wonder what it is... I just wanted to let you know that it happed in a pig rearing area and not in a paddy area. Also, I wanted to know about other symptoms of cystomiosis. Isn't it something that has to do with the mouse? I need some clarification.

DR. HATCHO

For the first question about the pig, mosquitoes multiply together with increase in number of pigs. Thus, outbreak of JE is often related to pig farming. In Sri Lanka, together with irrigation development, they promoted pig farming and the construction of pig farms, then there was a big outbreak. Pigs and JE are very much related because these mosquitoes like pig blood. There is a certain form of interaction among pigs, mosquitoes and human. Rice fields are also a factor. All these factors play an important role in the infection of JE. Once you get infected, mortality rate of JE is very high, as you mentioned.

Your second question about cystomiosis is that the parasites live in the vein, as I wrote in my paper and it gives damage to liver and internal body. It does not come outside. It slowly affects the human being. It does not lead to a sudden death, but the patients gradually become weak.

MR. DELWAR

Thank you Dr. Hatcho. I am from Bangladesh and a member of parliament. As you know, Bangladesh is one of the poorest countries in Asia, having about 130 million people in an area of 147,000km^2. You have brilliantly highlighted the problems addressed by Asia and the rest of the world regarding food, water supply, population and waterborne diseases. But what should we do in poor countries having such scarce financial abilities and resources. To tackle this, we need to increase our production. We need to reduce our population. As you know, we have succeeded to some extent in the area of population. But, even in a decade or so it multiplies and it will increase by another 2 billion at least. Thus, we have to increase production. You have shown the details of irrigation, and the use of insecticides and fertilisers. But, would you kindly suggest, in certain situations like Bangladesh, what do you do to solve our problems regarding food? We are a deficient country and not yet self-sufficient in production of food. Use of insecticides including DDT has not yet been banned in Bangladesh, because the negative effects and probabilities of negative effects have not been brought to the notice. The international organisations and research organisations should convey such information to these countries so that these insecticides are not used by the farmers. Because most farmers in our countries are very poor, illiterate, and uneducated, when they have to maximise their production, they go for any chemical to kill the pests in their production; there is such a big dilemma. Would you kindly clarify the globalisation, about which you have not spoken clearly, whether it is globalisation in respect of trade and commerce only, or globalisation in respect of distributing for population, or globalisation in respect of solving poverty? Poverty is at the root of all problems, and that is what we have to tackle. If we are

going to reduce poverty, we have to take a number of steps. What do we do? Would you suggest some solutions to problems of our country and other countries like us?

DR. HATCHO

Thank you for your comments and questions. I think this is a very difficult question to answer. Sincerely, I do not know the answer. I think this is just the main aim of this meeting, on how we are going to achieve this. My idea is that, as you mentioned, resources are limited. Therefore, the only possibility is to efficiently manage all these resources, and for the efficient management, we first need appropriate science and technology. Whether we should use DDT and other chemicals or not, it is a difficult question, and as I mentioned it might be the value judgment of the people. In terms of sustainability, if you are seeking long-term sustainability, you should learn from the experience of Japan--how we used them and have stopped using them after having some problems. Another issue is, in addition to technology as I mentioned, management of local resources. Who can manage those resources well for the local farmers? As I showed the pictures of these farmers and how they manage their local resources, I think we should learn more from all these farmers. I think they are very clever; they basically know how to manage those resources on a long-term, sustainable basis. The traditional technology alone is not effective enough. Thus, we should combine the modern types of new science and technology. In that sense, adaptive research is very important. Based on such research, there can be a sort of a jump of productivity from the current level. The resources are limited and if we use the same technology level, it will be the same. But, if we can have highly efficient method for using these technologies, production can go up. For that, I think adaptive research--many new science and technology--may be available in developed countries, but many of them cannot be applied directly to the developing countries. Thus, research investment is quite important. Of course, education also has a quite important impact. In a short term, it seems to be not so effective; however, in the long term it is. I know that Bangladesh faces a very urgent problem and you have to solve the problem on a short-term basis. But, I think it will be the political leadership--how to direct and how to prioritise your policy and strategy in the proper direction.

MS. BUNKLE

I wanted to respond to your answer, and say that there is something missing from your photograph, something that the previous speaker drew attention to; and that is women. Actually, that makes a huge difference to the choices people make about population, in correlation with reading. Isn't the reading itself about status of women and their ability to exercise choices, whether they are farmers--and the majority of the world's farmers are women--or mothers?

DR. HATCHO

I quite agree and I should have had picture of rural female farmers.

MS. BUNKLE

It is always a good place to start. The question was where do we start, and I think it is a good place to start.

MR. BHATIA

Thank you. Surya Chandra from Indonesia.

MR. CHANDRA

You mentioned trilemma: Population, including issues concerning food and energy, environment and development. What kind of development is possible in this trilemma case? Because in my knowledge, there are two kinds of paradigm of development: economic growth with extractive paradigm and humanistic development with innovative paradigm. So right now, what kind of development do we have in the world, still an economic growth or humanistic development? Thank you.

DR. HATCHO

As I mentioned, it will be a value judgment and matter of choice. But basic development is that we should supply sufficient food, basic education, basic clothing--that kind of basic human needs have to be satisfied. I think that is the first priority. For that, we still need development in many parts of the world. Of course, we might need additional, according to you, economic growth. I do not know how far we can go with that economic growth. However, the first priority should be the humanistic development. In Asia, in terms of agricultural development, it basically is subsistence farming. Rice farming is subsistence, basically, and not so much for export, except Thailand is exporting to other countries. But, if it is so, are we going to open the whole market and pursue globalisation? It is a staple food and a subsistence crop. So, it is a very difficult choice, I think. I do not have the answer, but you will have to make a very difficult choice. It would depend on, as I said, your culture, your values and your tradition.

MR. MACHIAS

This is a departure from your subject, but earlier today, we talked about drinking water volume going down. May I know, since you mentioned in your lecture, about Asia being able to expand the production positively, because we increased our irrigation? Isn't there a danger of using too much water for irrigation and the water that we take in? What is the status?

DR. HATCHO

Thank you. It is a very good question. I think irrigation sector has been criticised as "bad boys club" or "bad girls club (I do not know, but from the gender equality context)," because it is the biggest user of water. Agricultural sector accounts for 70 percent worldwide, in developing countries, much more. However, they mentioned that for the production to increase, we need to expand the irrigated area. So, in the irrigation sector, people are saying that we should use more water for food production. Environmental groups say that they need more water for nature. Some people want more water for people to drink while others want water for industrial development. Thus, there are competing demands. In the past, not many talks were held among these sectors, but a piece of information I would like to provide is that there was a big meeting 2 years ago in Holland called the World Water Forum II. After that, it was decided to form a sort of international group to have a dialogue—we call it the Water Dialogue. It included International Management Institute, UNEP, ICID--all of these international organisations related to water joined together and tried to have a dialogue on how we can compromise with each other, to have the best solutions about the water demands and possible supply, because supply is already limited. Of course, there is a possibility of desalinisation, but that is for the moment not in the picture. So, we should compromise to meet the demand with limited supply. Irrigation development is thus quite important, and we have to talk with other sectors of the economy and society.

DATUK ZIN

Thank you Mr. Professor. I liked the presentation very much. I would like to know, concerning population, what the people need to live. Asia is a part of the area that provides 54 percent of the world population. Yet, Asia has also become the major part where you have a lot of infectious diseases including malaria, encephalitis and also cystomiosis. And my country is affected with this disease JE. This JE, Japanese Encephalitis, I would like to know whether it is from Japan or it started somewhere in the region. Also, we recently found out that Japanese Encephalitis has killed a lot of pig rearing opportunity in my country.

The other part is, you have said that we have to feed the people, but how could we minimise the disease that came up from the irrigated area? You have not mentioned in your suggestions whether the dry paddy cultivation is better in order to reduce the disease, or we have yet to increase the production of this water paddy plantation. Also, at the same time, in order to maintain or increase the production of food, we have to kill the insects. Killing the insects traditionally for so many years have brought very fulfilling results. So, we have to use DDT, but you will face another side effect by using DDT. The side effects of DDT has not been known to the paddy planters in my country, but it is already known in Japan. I want to know why Japan is keeping silence about these effects of DDT. How are we going to overcome in order to avoid the side effects of DDT? What is your suggestion regarding the insecticide that should be used in place of DDT? Thank you.

DR. HATCHO

Thank you for your question. About the JE problem, I think it is a traditionally prevalent disease in all parts of Asia. It did not originate from Japan. I am not a health specialist, but I think a Japanese scientist identified the cause of disease, so it is called JE. All of these diseases exist locally, but because of expansion it becomes endemic.

Secondly, about this new technology of rice farming, intermittent irrigation, I put it in my lecture note that a Chinese researcher found out that with the adoption of this intermittent irrigation, they could save water by as much as 30 percent. They also could increase the productivity. They studied it quite widely, and in Japan, this kind of method has been applied traditionally in places where water is in short supply. Thus, it can be a possibility for the future practices to adopt this kind of intermittent irrigation. By drying the field, we can battle diseases that affect us, and we can save water while we increase yield. So it creates a win-win-win situation.

MS. HOARE

Thank you Professor Hatcho. I am Kelly Hoare from Australia. I suppose I would like to have an assurance this morning in the keynote address from Professor Takahashi. He spoke of the six-point governance, peace building, finance, technology and poverty which are going to be articulated in various conferences and lead up to Johannesburg. I would like an assurance that what you have discussed today in relation to irrigation and waterborne diseases would somehow link into precision watering that the professor earlier this morning spoke about in relation to technology. Could you give us that assurance? Thank you.

DR. HATCHO

I could not quite get your question...

MS. HOARE

You spoke about the irrigation systems and how different systems and technologies can have an effect in decreasing waterborne diseases. A speaker this morning spoke about precision watering in relation to new technologies and development of a global sustainable water policy. I was hoping to have an assurance, and even though the aid budgets of various countries are being reduced and somehow you and your views would be linked into that 6 point process.

DR. HATCHO

This morning Dr. Takahashi talked about this new technology. One was desalinisation and the other was, I remember, precision irrigation. However, in the irrigation sector, the mainstream is still gravity irrigation, because precision irrigation usually costs money and farmers cannot pay. Of course, dam construction cost has been increasing and gravity irrigation is becoming more difficult now, but it still is the major stream of irrigation sector. We have to come up with a technology for managing these gravity system wells. Of course, the development of new technology is important, and precision irrigation technology can spread, but it requires energy and investment. Therefore, for the moment, as I mentioned in my presentation, good management is the best choice.

CHINA

Economic development raised widespread attention in China, especially in Western China. The country has explored every possible approach to address this issue. To improve the living standards of the people, firstly, we are exploring every possible way to save water, including agricultural water, industrial water use and living water. Secondly, we should manage water properly. For example, the Yellow River often runs dry in China. It is caused by poor management. Over the past few years in the Yellow River Valley, a unified distribution of water resources is being practiced. Last year, the phenomenon of the Yellow River running dry decreased.

I would like to raise a question. In Western China, some areas have abundance of underground water, but what kind of impact will a long term use of underground water have on the ecological system?

DR. HATCHO

Regarding the ecological impact of using underground water in a massive scale, I think you can take an example from the United States where they are pumping ground water on a long-term basis and the water level started to decline. It is not a sustainable use. There is a term called "environmental capacity," which means that there shall always be limits of usage. If you use the amount which is recharged annually, there is no problem. You can maintain the groundwater level. It is like saving money in the bank. You only use the portion that came from interest. Like in forestry, you use only the amount which is renewable every year. In using groundwater, you should be very careful, because it is usually shallow in the beginning, and pumping cost is very small. But, as you start to go down, if you use it in a massive scale, there is another possibility of underground contamination with some kind of heavy metals. Thus, you should also be careful about that.

SESSION III

"Water and Population Issues in Rural Areas"

Session III

Chairperson:
Mr. Zhang Huaixi, MP (China)

Resource Person:
Ms. Keiko Yamamoto
JICA Senior Adviser

MR. HIROSE

A very good morning to you all, Ladies and Gentlemen. What a beautiful day. I hope you had a good sleep last night and that you are fully refreshed. This will be our last day together. I hope that you will enjoy the meeting and also the beautiful cherry blossom. I would like to introduce Mr. Zhang Huaixi as session chairperson for the third session for the issue of rural areas. He is a Standing Committee Member of National People's Congress, NPC. Also he is the Vice Chairman of Education, Science, Culture and Health Committee of NPC and also Vice Chairman of AFPPD.

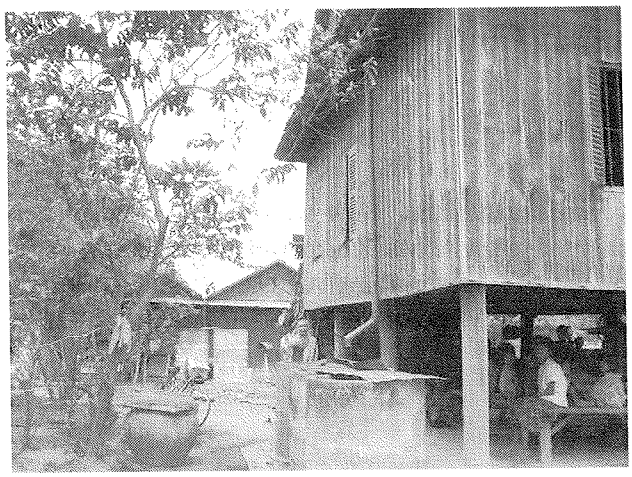
MR. HUAIXI

Good morning, every parliamentarian. Now we can begin the first part of today's meeting. Today, we are very delighted to invite Ms. Keiko Yamamoto to make a speech to all of us. Her topic is "Water and Population Issues in Rural Areas." Professor has a very insightful research about this issue, and I believe her speech will be very interesting and wonderful. Now, please take the floor.

"Water and Population Issues in Rural Areas"

Ms. Keiko Yamamoto
JICA Senior Adviser

Good morning, Ladies and Gentlemen. Thank you for inviting us to such a nice meeting. My presentation today is "Rural Water Supply and Sanitation." My name is Keiko Yamamoto. I work for Japan International Cooperation Agency (JICA). JICA assists developing countries all over the world. I visited many countries for water supply and sanitation. The content of today's presentation is, first, the existing situation of rural areas in Asia for the supply of sanitation and water-caused problems of women and children, and groundwater pollution. Secondly, I would like to explain about the approach for improving rural life. One is appropriate technology and community participation, and water and gender. And I would like to talk a little bit about the past Japanese experience. Thirdly, I would like to explain about a global target.



This is a photo that I took in Southern Cambodia.

This is rainwater catchments system. We can see this system in Southeast Asia. It is a very common system, but in many cases, they are unsanitary. So, the challenge is how to keep water clean.This is a photo from Laos that I took 10 years ago, so the situation may have been improved over the last 10 years. Water vendors take water from the Mekong River and sell it without any treatment.

In the Philippines, near the Metropolitan Manila, people living in rural areas do not have enough water, so sometimes they buy water from the water wagon, which is inevitably more expensive than the tap water.

In illegal residence area, people use this water for toilet, for bathing, for washing and children's playing. WHO and UNICEF published the Global Water Supply and Sanitation Assessment 2000 Report. I will pick out some data from this publication and will explain the existing situation with emphasis on Asia. Orange and red colours show the

You can see that many African and Asian countries are with low water supply coverage. I picked out the 10 countries with lowest water supply coverage in Asia.

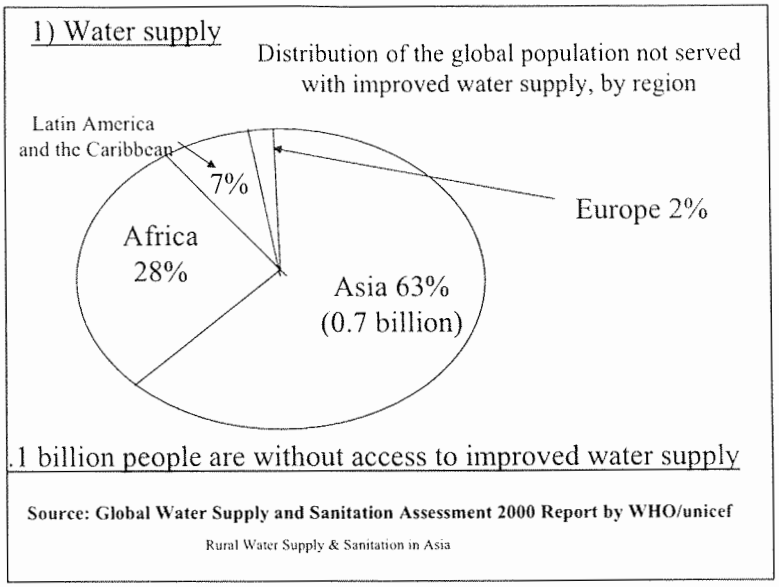


fig. 3-1

Water Supply Coverage, 2000

Lowest 10 in Asia

1.Afghanistan	13% (11)	6. Bhutan	62%(60)
2.Cambodia	30%(25)	7. Myanmar	68% (60)
3.Oman	39% (30)	8. Yemen	69% (64)

The country with worst water supply coverage is Afghanistan, with13 and 11 percent in rural areas. The second worst is Cambodia, third Oman, fourth Vietnam and fifth Mongolia.

This is the situation of sanitation. I also picked out the 10 lowest countries in Asia with regard to sanitation coverage.

Sanitation Coverage, 2000

Lowest 10 in Asia

1. Afghanistan	12% (8)	6. China	38% (24)
2. Cambodia	18% (10)	7. Yemen	45% (31)
3. Nepal	27% (20)	8. Myanmar	46%

The worst and the second worst countries are the same as those for water supply coverage; Afghanistan and Cambodia. The third is Nepal and the fourth is Mongolia. The situation in

rural areas of Mongolia is severe at only 2 percent. And India comes fifth.

This is unserved population. A total of 1.1 billion people do not have access to safe water all over the world, and 63 percent of 1.1 billion people live in Asia.

Water Supply Coverage in Asia, 1990 / 2000

(population millions)

		Total population	Population served	Population unserved	% Served
Global	Urban	2292/**2845**	2179/**2672**	113/ **173**	95 / **94**
	Rural	2974/**3210**	1961/**2284**	1013/ **926**	66 / **71**
	Total	5266/**6055**	4140/**4956**	1126/**1099**	79 / **82**
Asia	Urban	1029/**1352**	972/**1254**	57/ **98**	94 / **93**
	Rural	2151/**2331**	1433/**1736**	718/ **595**	67 / **75**
	Total	3180/**3683**	2405/**2990**	775/ **693**	76 / **81**

Source: Global Water Supply and Sanitation Assessment 2000 Report by WHO/UNICEF

Rural Water Supply & Sanitation in Asia

Target water supply coverage in 2015,2025

Served population/Total population Unit : million

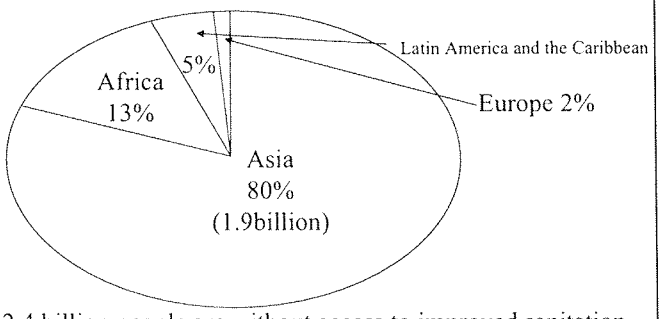
	Rural (%)	Urban (%)	Total (%)
Asia/2000	1736/2331 (74)	1254/1352 (93)	2990/3683 (81)
Asia/2015	2097/2404 (87) *+361*	1873/1943 (96) *+619*	3970/4347 (91) *+980*
Asia/2025	2336/2336(100) *+600*	2387/2387(100) *+1133*	4723/4723(100) *+1733*
Global/2000	2284/3210 (71)	2672/2845 (94)	4956/6055 (82)
Global/2015	2853/3337 (85) *+569*	3690/3817 (97) *+1018*	6542/7154 (91) *+1586*
Global/2025	3286/3286(100) *+1002*	4536/4536 (100) *+1864*	7823/7823 (100) *+2867*

Rural Water Supply & Sanitation in Asia

This corresponds to 0.7 billion people which is a huge number. This is sanitation.

2) Sanitation

Distribution of the global population not served with improved sanitation, by region



2.4 billion people are without access to improved sanitation

Source: Global Water Supply and Sanitation Assessment 2000 Report by WHO/UNICEF

Rural Water Supply & Sanitation in Asia

On the other hand, globally, 2.4 billion people do not have access to sanitation facilities, and 80 percent of these people live in Asia. 1.9 billion people do not have access to sanitary facilities in Asia.

I prepared a table comparing 1990 and 2000 by picking out data from the WHO report.

Sanitation Coverage in Asia, 1990 / **2000**

(population millions)

		Total Population	Population Served	Population Unserved	% Served
Global	Urban	2292/**2845**	1877/**2442**	415/ **403**	82 / **86**
	Rural	2974/**3210**	1028/**1210**	1946/**2000**	35 / **38**
	Total	5266/**6055**	2905/**3652**	2361/**2403**	55 / **60**
Asia	Urban	1029/**1352**	690/**1055**	339/ **297**	67 / **78**
	Rural	2151/**2331**	496/ **712**	1655/**1619**	23 / **31**
	Total	3180/**3683**	1186/**1767**	1994/**1916**	37 / **48**

Source: Global Water Supply and Sanitation Assessment 2000 Report by WHO/UNICEF

Rural Water Supply & Sanitation in Asia

You can see in 1990, the coverage of sanitary facilities was 79 percent and population was 4.1 billion. After 10 years, the coverage increased to 82 percent, while population increased to 4.9 billion. During these 10 years, 0.8 billion people gained access to safe water, 1.099 billion people could not obtain safe water. Let's look at the situation of Asia in the year 2000. 93 percent of urban areas are covered, while 75 percent of rural areas are covered in 2000. In total, 81 percent of population was able to get safe water. But still, some 7 hundred million people remained without access to safe water. If you compare unserved population in urban and rural areas, the number is 6 times greater in rural areas compared to urban areas.

This is sanitation.

Sanitation Coverage 2000

Lowest 10 in Asia

1. Afghanistan	12% (8)	6. China	38% (24)
2. Cambodia	18% (10)	7. Yemen	45% (31)
3. Nepal	27% (20)	8. Myanmar	46% (39)
4. Mongolia	30% (2)	9. Lao P.D.R	46% (34)
5. India	31% (14)	10. Bangladesh	53%(44)

( ): rural

Source: Global Water Supply and Sanitation Assessment 2000 Report
By WHO and UNICEF

Rural Water Supply & Sanitation in Asia

Comparison is also made here for the years 1990 and 2000. The coverage in urban areas was 82 percent in 1990. In 2000, it went up to 86 percent. In rural areas, the coverage was 35 percent in 1990 and went up to only 38 percent after 10 years in 2000. The increase was only

3 percent. The coverage for urban and rural areas combined was 55 percent in 1990 and 60 percent in 2000. When we see the figures for Asia in 2000, the figure is 78 percent in urban areas and 31 percent in rural areas. The figure for rural areas is less than half of that for urban areas. In addition, 1.6 billion unserved population in rural areas do not have access to sanitary facilities. The coverage for Asia as a whole in 2000 was only 48 percent.

I would like to move on to the next subject. It is children and women that suffer from unserved water supply and sanitation. Morbidity rate of women and children increases under unhygienic conditions and mortality rate also goes up as a result. In addition, fetching water is very hard work that is performed mainly by women and children. As a result, children cannot go to school, and it is the girls that miss in most cases. Also, women cannot have productive work or cannot take care of their children. This is a very serious problem related to water supply.

This photo shows one of the projects implemented by JICA in the Philippines.

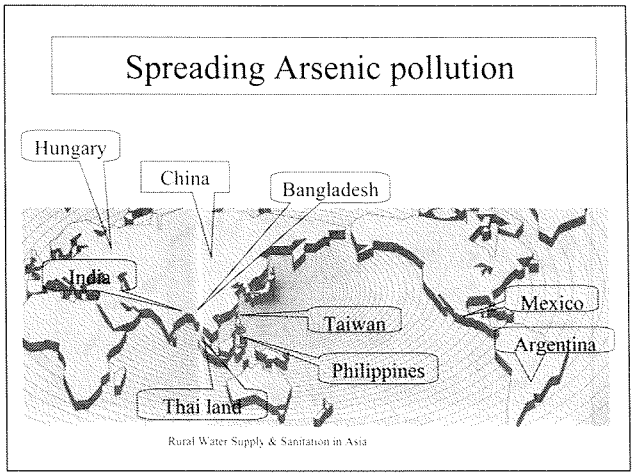
JICA is building public taps in rural areas. Although water supply situation has been significantly improved, girls are still carrying water in containers. This is very hard work.

This is a hand pump project in Cambodia.

UNICEF and JICA built many hand pumps of this kind in the rural areas of Cambodia. Their lives were significantly improved, although water quality problems remain in some areas.

Recently, groundwater pollution is coming up all over the world, both in industrialised countries and developing countries. I would like to explain about a case in the developing countries. Developing countries are facing mainly 3 types of pollution; nitrate, arsenic and fluoride. Today, I would like to talk about arsenic and fluoride.

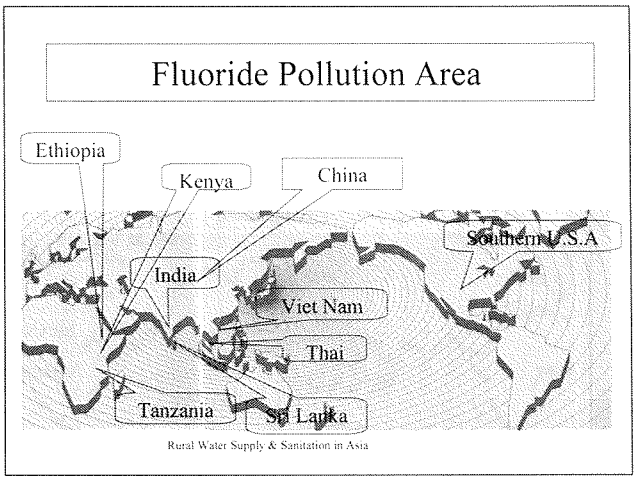
Arsenic pollution in groundwater is spread all over the world.



Last year, I visited Vietnam. Vietnam faces this problem in areas near Hanoi. Also in Africa, this problem exists in Ghana. The biggest problem exists in Bangladesh and in West Bengal, India. The situation is very grave in these areas. This is a chronic patient suffering from arsenic poisoning in Bangladesh. The photo to the left is a case of keratosis on foot. The middle photo is the case of keratosis on hand. The right photo shows a case of black skin. These patients ultimately develop skin cancer. These people drank well water for several years. Some of them suffered from this kind of disease. According to some reports, there are more than 1 million patients in Bangladesh and India. Millions of people also suffer from this disease in northern China. It is said that more than 30 million are potentially suffering from this disease. Thirty-five million people are drinking water with arsenic concentration exceeding the WHO standard. The WHO standard for arsenic concentration is 0.01mg per litre. These people are drinking water with higher arsenic concentration every day.

Now many countries and international organisations are trying to assist the people of Bangladesh who are suffering from this terrible situation. I would like to explain about the countermeasures. There are 7 main countermeasures. The first is studying the existing situation. For example, a study is being carried out to identify the areas with high arsenic concentration and how people are using the groundwater in such areas. This is a study conducted mainly by UNICEF. The second is development of alternative source of clean water. JICA's study team is finding deep wells that can potentially supply clean water. The third is study for local treatment system. The Netherlands developed an arsenic removal equipment. UNICEF is also studying the pond sand filter. Japan has also developed an arsenic removal filter. However, they have yet to develop a practical system for villagers. The fourth is development of a simple analysis kit. A field analysis kit is being developed by the Japanese NGOs, WHO, and Canada. The fifth is strengthening of technique for water analysis. JICA is providing atomic absorption-spectrophotometers and training the Bangladeshi staff in the method of analysis as a part of its technical cooperation projects. The sixth is hygiene and sanitary education. UNDP and UNICEF are helping with community education. The seventh is the study on remedies for diseases caused by arsenic. This kind of assistance is very important not only for Bangladesh but also for China, India and other countries. Thus, we donors are focusing much more on this problem.

Next is fluoride pollution.



Fluoride is another natural contaminant found in large quantities all over the world. Last year, I visited the villages on the coastal region of central Vietnam. Some villagers could not smile because they were suffering from fluoride pollution. This is picture is not in Asia but a case in Tanzania.
Fluoride attacks children in growth stage. Children are born with this kind of deformity or dental problem. This photo shows a very rare case. We hear that many countries have patients suffering from these kinds of problems, although we do not have many photos of them. We can only see the dental problems easily in Sri Lanka, China, India and Bangladesh.

I would like to explain a little bit about relationship between these symptoms and concentration. According to WHO, people will have tooth problems when concentration of fluoride in water is between 1 and 2 milligram per litre. When concentration exceeds 4 milligram per litre, a skeletal problem occurs. When concentration exceeds 10 milligram per litre, some people will have severe born deformity. In the case of fluoride, people do not focus so much on the issue compared to arsenic. So, we need to study more extensively throughout the world. There may be many hidden patients.

The second is on approach for improving rural life. The key elements for the success of projects are appropriate technology, community participation, and gender and development. Regarding appropriate technology, projects should be low cost, because local people do not have the economic capacity and must maintain the water supply and sanitation systems themselves. So people collect tariffs and perform maintenance using this money. Thus, low-cost projects are the best. Projects should use local materials, because they are much cheaper. Projects should also use simple technology. Simple technology is adaptable for villagers who do not have engineers and skilled persons among them. They have to learn and be trained in repairing skills and management. So, simple technology and simple management are the best. Nowadays, even the developing countries are seeking modern complicated technologies. However, these technologies are costly, so we should take all locally available technologies into consideration. Many wonderful ideas are there. All we need to do is make some improvements on these local technologies.

As for community participation, people have to understand the project to make it sustainable. People need to participate in the project to reflect real necessities and practical ideas. People

should also have ownership, because people will take much care and share the cost. Furthermore, people can obtain maintenance skills by joining the project. In a participatory approach, people participate in all stages of the project, such as planning, training, education, implementation, operation and maintenance. People will offer time, labour, materials and money.

This is a case of community participation in Cambodia. People gather at one place and elect the members of a water committee. These 5 members elected from the villagers consist of 2 men and 3 women. There is one president, one vice president, one treasurer and one caretaker. This is a material that has been prepared by UNICEF. This material is prepared in the local language by taking traditional customs into consideration.

This is a project in the Philippines in which JICA built school toilets. This project is good for children's education.

As for gender and development, a water supply and sanitation project has very close relationship with women. Women fetch water. Women wash clothes. Women cook using water. So, women know very well about water. Gender issue and gender sensitivity are essential for the success of water supply and sanitation project.

Something might have gone wrong with this project had it not been for women's perspective. This is the case in the Philippines. Women in the Philippines are very strong. This woman is the president of the water committee. She is a very good president and is maintaining and organising the water committee and the water supply system.

This is also a case in the Philippines. Men also fetch water. According to a JICA report, men fetch water also in Cambodia. However, since some men go to urban areas to work, women mainly fetch water in families without male members. Japan has also experienced this in the past. The movement that constructed the small water supply system in the community by women and youth group through establishment of a small countrywide fund in the 1950s. In addition, a project for the improvement of rural life started in 1948 introduced an extension of home economics from the U.S.

This project had a very effective activity of specialists for promoting better life improvements with women's associations in rural areas of Japan. Life in rural areas of Japan was improved significantly by these activities. For example, kitchen, water tank, toilet, and small water supply were improved as well as health and family relations, especially between wife and her mother-in-law.

The photo to the left shows a Japanese rural area. This woman took water from a spring and was carrying it. It is very hard work. After the water supply system was improved, a woman sent a letter entitled "Goodbye water tank. Goodbye carrying water" to a newspaper to express how delighted they were with their situation. The photo to the right is from the present. The activities still continue today. Now, they are talking about finding wives for their sons which has become very difficult these days.

This is the Global Target 2000.

Target water supply coverage

in 2015,2025 Served population/Total population Unit : million

	Rural (%)	Urban (%)	Total (%)
Asia/2000	1736/2331 (74)	1254/1352 (93)	2990/3683 (81)
Asia/2015	2097/2404 (87) *+361*	1873/1943 (96) *+619*	3970/4347 (91) *+980*
Asia/2025	2336/2336(100) *+600*	2387/2387(100) *+1133*	4723/4723(100) *+1733*
Global/2000	2284/3210 (71)	2672/2845 (94)	4956/6055 (82)
Global/2015	2853/3337 (85) *+569*	3690/3817 (97) *+1018*	6542/7154 (91) *+1586*
Global/2025	3286/3286(100) *+1002*	4536/4536 (100) *+1864*	7823/7823 (100) *+2867*

Rural Water Supply & Sanitation in Asia

The Second World Water Forum took place in Hague and presented Vision 21. There are 3 targets concerning water supply and sanitation. The first target is halve the proportion of people without access to hygienic sanitation facilities by 2015. The second target is to reduce by one-half the proportion of people without sustainable access to adequate quantity of affordable and safe water. The third target is to provide water sanitation and hygiene for all people by 2025. This is the Global Target.

I showed the number of people corresponding to these targets in a table. We will have to attain these targets in 15 to 25 years. The figures are large. By 2015, at least another 8 billion people will have to gain access to sanitation facilities. Additionally, in Asia, 0.98 billion people will have to gain access to safe water.

Target Sanitation Coverage

in 2015,2025 Served population/Total population Unit : million

	Rural (%)	Urban (%)	Total (%)
Asia/2000	712/2331 (31)	1055/1352 (78)	1767/3683 (48)
Asia/2015	1569/2404(65) *+857*	1730/1943 (89) *+675*	3299/4347 (76) *+1532*
Asia/2025	2335/2335(100) *+1623*	2387/2387(100) *+1332*	4723/4723(100) *+2956*
Global/2000	1210/3210 (38)	2442/2845 (86)	3652/6055 (60)
Global/2015	2294/3337 (69) *+1084*	3528/3817 (92) *+1086*	5822/7154 (81) *+2170*
Global/2025	3286/3286(100) *+2076*	4536/4536 (100) *+2094*	7823/7823 (100) *+4171*

Rural Water Supply & Sanitation in Asia

This concludes my presentation.

Discussion

MR. HUAIXI
Ms. Keiko Yamamoto made a very practical and pragmatic speech about water. Her speech was very insightful and interesting. I think you were interested in it. Now, we have something to discuss and raise questions.

DR. SAROJA
I am Dr. Saroja, a medical doctor, a gynaecologist, a member of parliament from India. Could you just explain the activities for improving rural life in Japan? The first point, the project for improvement of rural life started in 1948, introduced home economics from the U.S. Could you elaborate Madam?

MS. YAMAMOTO
Specialists on rural life improvement from universities were sent to rural areas to identify the problems related to families and rural life and to help them to improve rural life. It was an American system. At the time, Japan was occupied by the American occupational forces, and GHQ, the General Headquarters, controlled the Japanese Government. GHQ issued an order to improve rural life in Japan. Rural life was in distressed condition, and unhygienic situations prevailed at the time. Therefore, Ministry of Agriculture decided to implement this activity, and local governments employed specialists to teach improvement of everyday life to rural women. They visited communities several times a month and held meetings with women's groups to talk about their problems and difficulties. The specialists also talked to the women about solutions for such problems. In some cases, toilets of the Japanese rural households at the time were located outside of the house. As people wanted to have their toilets inside their houses, the specialists offered their help in requesting local governments in seeking assistance for these kinds of small projects, and local governments offered their budget to the villagers in some cases.

Regarding health and nutrition matters, the specialists taught people varieties of food and cooking methods that are good for health of rural families. This kind of work was very very effective in improving rural life. In addition, engineers, most of whom were men, assisted farmers with agricultural techniques. It worked in a kind of combination in which men assisted with technical matters and women assisted with matters related to rural life. As I mentioned before, "rural life" includes everything including family relationships, food, houses and water supply.

MR. HOSSAIN
I'm Khondker Delwar Hossain, a member of the Bangladesh Parliament. We have just seen in the pictures the horrible scene of Bangladesh in respect of waterborne sanitation problem. Bangladesh is a country with population of 130 million people living on her land. The population density is 860 persons per square kilometre and is said to increase to 1200 persons per square kilometre by the year 2025. Although the population growth rate has declined in the recent years, it is still around 1.4 percent. Per capita income of people is only 300 U.S. dollars. Water supply to the urban people is only 15 percent and sanitation coverage is only about 20 percent. So, there is a crisis for drinking water supply to the urban dwellers and the

sanitary problem is also very acute. These problems have been aggravated by the arsenic and fluoride contamination problems as you have just depicted in the pictures. We must admit that there is a resource and financial constraint in the country to tackle this problem. If there is no alternative source of water supply for drinking purposes to rural as well as urban people, they have to drink from that, because without water people cannot go for a day here. As for drinking water in rural areas, out of 64 districts--like prefectures in Japan--tube well and hand pumped waters are contaminated with arsenic in 59 districts. An international action through international fora including UNICEF is urgently needed for Bangladesh. Would you please give some us some light in this respect?

MS. YAMAMOTO
Guidelines of treatment system?

MR. HOSSAIN
We know that there is technology and methods available, but not in our country. We don not have the technological know-how and other methods, nor do we have the financial resources to tackle this gigantic problem. I was seeking to know whether this association and international agencies could suggest some remedies through which we can tackle this problem and come out of this danger. Am I clear to you Madam?

MS. BUNKLE
I think the gentleman is saying that we all understand how big this problem is. And we all sympathize with the size of this problem. I think his question is same as that of my Filipino colleague's. "Where do we start to solve it? How are we going to begin? Where are the resources?" Internationally, Bangladesh is too poor and the problem is too big to deal with it alone. And I think the question we are asking is "How do we start? Where is the resource? Where is the mechanism for us to begin to solve the problem practically? And I think the colleague from Bangladesh is asking that question.

MS. YAMAMOTO
So the arsenic problem is very huge in Bangladesh. A lot of ideas and techniques and a lot of money will have to be gathered to solve this problem. Regarding the water source, there is high arsenic concentration in the shallow part of the aquifer, but we have found clean water in the deeper aquifer. One of the alternatives would be to use this deep well temporarily, while setting the long-term target on building the treatment system using river water. River water requires much more technical treatment, but you should ultimately use this treatment system, because it is much safer. Maybe in the medium term, you can use deep well or some simple treatment system. You already have a local traditional system using pumps. We need to check this, because some people say it is effective and others say it is not. We gathered many different kinds of techniques, simple or somewhat complicated, and we gather ideas about what we can do for Bangladesh or other countries. This kind of action is very important. We do not have the best solution now, but Dr. Magara may be able to suggest something.

DR. MAGARA
My name is Magara from Hokkaido University. I was in Bangladesh only 2 weeks ago, attending a seminar on arsenic mitigation. There was a study conducted as joint research between our university and Rajhahi University. Fortunately or unfortunately, general director of DPHE had changed in your government. Before then, UN agencies and donor countries had

held a coordination meeting on the arsenic situation. However, the new general director has not yet found a way for the best coordination among the donors including the UN agencies. Therefore, I hope that donor agencies have already prepared to cooperate with your government, but we hope that the initiative will be taken by your side. Then, we will be able cooperate very smoothly. That is my idea.

MR. GANBYAMBA

I have one question on behalf of Mongolia. I am Mr. Ganbyamba, Member of Parliament, Mongolia. First of all I would like to thank you for your really interesting presentation in which you have touched on many practical problems. As you said, in Mongolia, for example, sanitation problems in rural areas are very terrible. But of course, on the other hand, it is very difficult to compare Mongolia with some other countries like those in Southeast Asia that are heavily-populated tropical countries. The situation may be different. In Mongolia, the problem is not only of a technical or financial nature--it is a problem of lifestyle. But you also have good experience. For example, you have changed your lifestyle in Japan through American assistance. I would like to know if JICA--maybe not JICA but the Japanese Government--could implement such kind of projects, for example, in Mongolia. It is a very practical question.

MS. YAMAMOTO

I hope so. I think so. The Japanese experience of improving rural life is very interesting and effective. Now, we are preparing a report of these activities. The reason we are preparing this report is for the assistance of the developing countries. The Japanese volunteers may be able to use this report for their activities in Mongolia and other countries. The Japanese JICA specialists and experts may also be able to use or transfer this technology. These activities of the American assistance took place just after World War II. Extension workers from that time are now very old. We interviewed in detail how they worked, how they approached the villagers and how they overcame the difficulties. We interviewed them one by one at many prefectures. So, you will find very good experiences in the report, and I would like to distribute this report to the developing countries.

DR. PATANAKULLERT

Mr. Chairperson. I am Dr. Pompich Patanakullert, a paediatrician, Member of Parliament,from Thailand. I have some questions for you about water pollution in the cases you mentioned--about the water pollution that Asia is facing such as arsenic pollution and fluoride pollution. The map on page 5 shows that there are arsenic and fluoride pollution areas in Thailand. But for Thailand, regarding water pollution, I understand that we have a case of lead contamination in the river at a pretty village in Kanchanaburi Province and Taam Taru Village in Yara Province. And we have arsenic poisoning in Raunphiboon district in Nakornsrithamarat Province. I have never heard about fluoride contamination in Thailand. So these maps in page 5 show that we have these problems. I want to know where they exist. I think it will be very useful for us. Thank you.

MS. YAMAMOTO

I am sorry, but I do not have information about Thailand. So I will send it to you later.

DR. MACIAS

I am Dr. Macias from the Philippines. I am a member of parliament. In one of your slides,

you have targets; One is global targets for water supply and sanitation., and the other one is target water supply coverage. This gives me an impression that there is an agency or group of nations that have programmes to reach a target. Or is this only the ideal situation that you are trying to attain? That is my question. I would like to make a comment on those pictures you talked about gathering water in the Philippines. Maybe Japanese should do that because that is the area where my colleague, Congresswoman Lagman's husband has been involved with. So, are these targets or ideal situations that you want to attain?

MS. YAMAMOTO
So you asked whether they were targets. These are huge targets. The next Third World Water Forum will take place in Japan next March. Now, water resource shortage and water resource problem have become big global issues. The first World Water Forum took place in Morocco in 1997 and large conferences are held every 3 years with people attending from all over the world. The second conference was held in the Hague in the year 2000. In that conference, WSSCC, Water Supply and Sanitation Collaborative Council, prepared this Vision 21 and presented it at this conference. And these targets were adopted at this conference. In the past, from 1981 to 1990 was the decade of water. At that time, a target was set to provide safe water and sanitation to all people by the year 2000. However, this target was delayed, and WSSCC postponed the target year to 2021. I do not know if this target is practical or not, but when we see these large numbers, we will have to pour in huge amount of finance into these projects. I think it is a little bit difficult to attain this target by 2025. But 1.1 billion people currently do not have access to safe water, so it depends on the person, whether 25 years is a long time or not.

DR. MACIAS
May I know the countries that attended the conference made commitments, or some agencies made commitments, because I would like to find out if there is such programme in my country?

MS. YAMAMOTO
I had some help from Dr. Magara. These targets were set based on the figures sent to WSSCC from the health ministries of respective countries.

DR. MACIAS
In other words, each country made commitments to attain these figures at a later date. That is what you are saying. Thank you.

DR. SAROJA
Madam. Could you just explain the methodology or the mechanism that is being followed in Japan to provide safe and protected drinking water to the rural people? Is it government agency exclusively looking after this important scheme? Or, any organisation is exclusively assigned for this purpose? Is Japan encouraging the community participation and involvement of more women in this programme, for the benefit of all of us, for the benefit of all those countries in need of supply of this technology as well as money constraints? Will you Madam come out with a solution? Practical, positive, meaningful solution to curve this important problem. Thank you. Especially for the developing countries, also for India.

MS. YAMAMOTO
Regarding the small-scale water supply system, in 1952, the Japanese Government enacted a

subsidy system for implementing the small-scale water supply system. At the time, the hygienic situation of rural areas in Japan was terrible with waterborne diseases breaking out all over the country. So the government took the initiative. But, at the same time, community raised their own small funds by selling eggs, for example, to save money. They also received the government subsidy to make a small-scale water supply system in each village. These activities caught on throughout the country. In addition, the Ministry of Health prepared educational and informational materials such as films and pamphlets for the purpose of dissemination in communities. As I mentioned earlier, the Ministry of Agriculture created an assistance system for each prefecture. Extension workers assisted improvement of water supplies. Usually, villagers did not have enough information and skills for presenting their demands and requests. So, the assistance system was excellent in the Japanese experience. Also, the extension workers received trainers' training from the Ministry. Extension workers had to know everything about rural life. So, they learned a lot of things and organised a system through which they could consult each other. The relationship was very strong. This is one of the key points.

MR. HUAIXI

Any questions? If you do not have any questions, we can drink safe water now. Just now, Ms. Yamamoto has delivered a very good speech. It aroused widespread attention from you. You have raised a lot of questions and Ms. Yamamoto has answered very well. I believe that the discussion about this issue is crucial for each country to address the issue of rural water. Now we can drink safe water. Thank you.

SESSION IV

"Water and Cities"

Session IV

Chairperson:
Ms. Kelly Hoare, MP (Australia)

Resource Person:
Dr. Yasumoto Magara
Professor, Hokkaido University
Graduate School of Engineering

Resource Person:
Mr. Yuri Steklov
Economic Affairs Officer
Water and Natural Resources Section
UN ESCAP Bangkok

"Urban Water Supply for Health of All"

Dr. Yasumoto Magara
Professor, Hokkaido University
Graduate School of Engineering

1. Water and Health

WHO defines health in its charter as follows: "Health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity." Paying attention only to biological aspects is not enough when thinking about people having their lives with dignity as human beings. However, energy and metabolism, which are essential factors for existence, are fully dependent on water: Food and water for maintaining living creatures. We are on the verge of the new century, when it is doubtful whether we can secure water, which is minimum necessity. Water is used not only in food production, but also in the secondary industry, the third industry and in the information/communication industry. When we use water, we use its attribute; that is, we use the dissolving power, transportation power, and heat characteristic. Therefore, what we have to recognize is that when we use water, its amount does not change, instead, it changes into wastewater with different kinds of attributes.

2. Population and water resource

The water environment is one aspect of water circulation on the earth. Especially fresh water resource, which is essential to our lives, has a constant amount of circulation: 150 x 1012 m^3, which circulates with a period of 1 week to 10 days. The world population has reached 6 billion in 1999. It is expected to increase up to 8 billion by 2015. Considering that, it took only about 30 years for the population to grow from 4 billion to 6 billion, it can be said that the speed at which population increases is accelerating.

Generally, people tend to try to improve their lives, however, with such a rapid population increase in so many countries, how long the earth will be able to support the lives of people? In addition, many industrialized countries, including Japan, now have problems such as aging society with a fewer children. These countries also try to establish new socioeconomic structure, with service industry in its centre. This new socioeconomic structure can or cannot promise a sustainable development of global system.

6 billion people are now using 150 x 1012 m^3 of this fresh water, and 8 billion people will use it before long and 10 billion people will use it in the middle of the 21st century. However, it is evident that fresh water is seasonally and regionally distributed. The fresh water circulates in which evaporates from the surface of the earth, and returns to the surface as rainfall. It gathers to flow into rivers, or sometimes flows into the ground as underground water. Originally, rainwater itself does not contain any contaminants; however, in the process of flowing, it includes some contaminants on the surface because of the attribute of water. River water cannot be used for drinking without any treatments. On the other hand, underground water can be used without any treatments, as long as there are no hazardous inorganic substances in the soil and they don't dissolve into the water. This is because in the natural ground water harvesting process, the self-purification process such as filtration and adsorption potentials of

the soil decreases the contaminants on the surface. Except for this clean underground water, most of the fresh water existing as water supply cannot be used without treatments. If it is used without treatments, it will cause various kinds of adverse health effects, including infectious disease, and the troubles in using water.

3. Water supply and epidemiology

The science which clarifies how an environmental factor has an influence on the health of human beings started as epidemiology. In 1855, John Snow showed statistically that in the region where water service with sand filtration was used, the incidence of cholera was smaller than in other regions. Since our society exists in the natural/man made water metabolic system, we are also affected not only by physical properties, chemical impurities, but also by infectious microorganisms, which are co-existent with human beings and animals, and toxic algae. The urban water metabolic system such as water supply and sanitation has been established as countermeasures against communicable diseases caused by biological vectors. In Japan in the 1960s, more than 30,000 people a year were infected with either water or food born diseases such as dysentery, typhoid, and poliomyelitis. However, within a couple of decades, water born diseases have been almost controlled by the provision of water supply, sanitation facilities, food sanitation and health education.

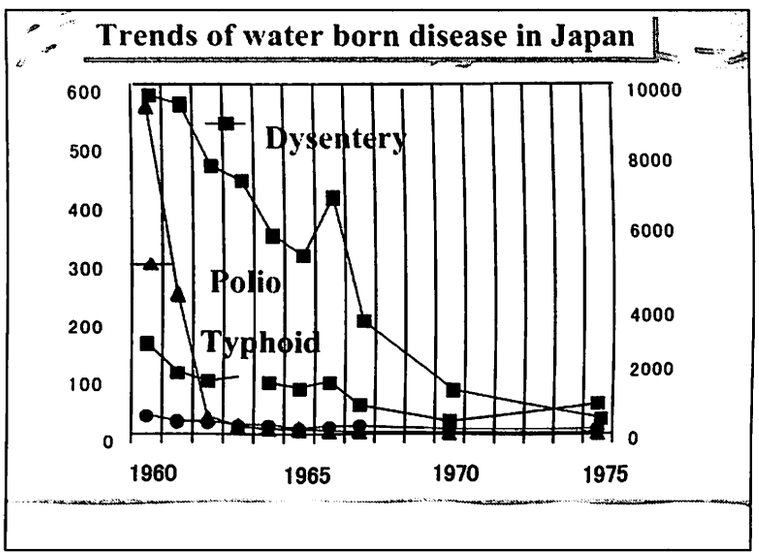


Fig. 4-1

Unlike drinking water safety law in the United States or the WHO drinking water quality guideline, water service law in Japan provide that the people should always get safe and better quality drinking water. This law is enacted in order to achieve people's right and duty specified in Article 25 of the Constitution: improvement of public health. Its aim is to provide abundant, cheap, and clean water service for the people in order to improve public health. This law was enacted in 1957, and was revised a few times. Its aim is to specify the responsibility of the government and the local governments and the duty of the people to spread water service. And it can be said that its aim has been attained when seeing that water service is widely spread.

4. The Global Water Supply and Sanitation Assessment

The Global Water Supply and Sanitation Assessment 2000 presented the findings of the fourth assessment by the WHO and UNICEF Joint Monitoring Programme. Previous reports were produced in 1991, 1993 and 1996.

During the period 1990-2000, it is estimated that the global population increased by 15% (from 5.27 to 6.06 billion). Within the total figure, the global population increased by one quarter, while the rural population increased by less than 8%. The population growth of the 1990s meant that an estimated 620million additional people gained access to water supply by 2000, and 435 million additional people gained access to sanitation facilities just to maintain the percentage coverage at constant levels. An extraordinary work was done in the sector to serve an ever-increasing population. However, despite all the efforts made and the results achieved, there remains a back age of 1.1 billion people without access to improved water supply and 2.4 billion without access to appropriated sanitation facilities. For both water supply and sanitation, the vast majority of those without access are in Asia.

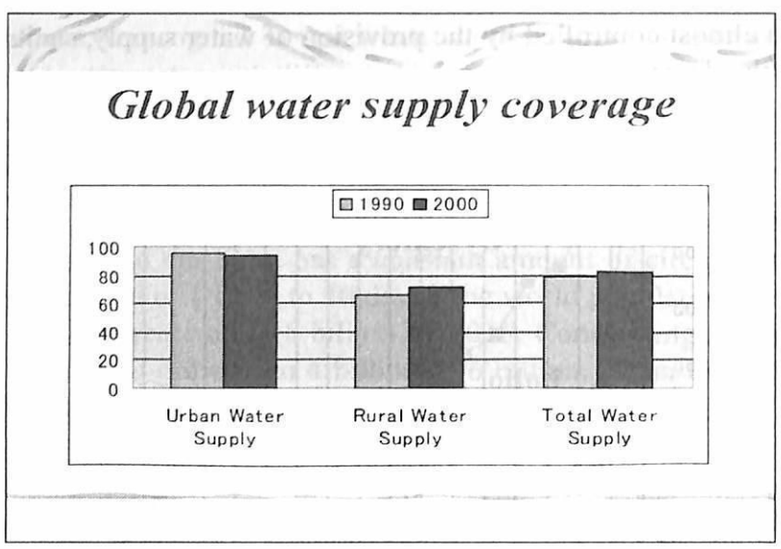


Fig. 4-2

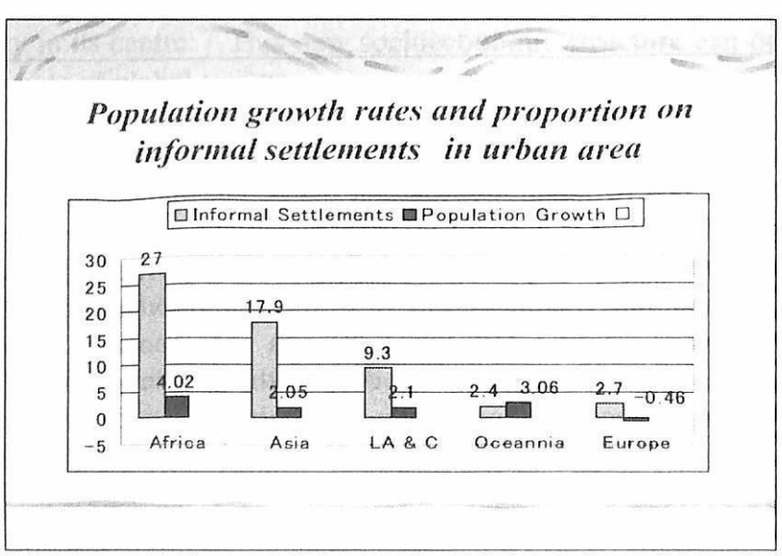


Fig. 4-3

The high rate of urban population growth will place particularly heavy demands on the capacity of the developing countries to extend, or, even maintain, their service coverage. This includes the mean population growth rate of the cities, as well as the proportion of the population living in informal settlements. The population growth rate for Africa (4.0%) is about twice that of Asia and Latin America.

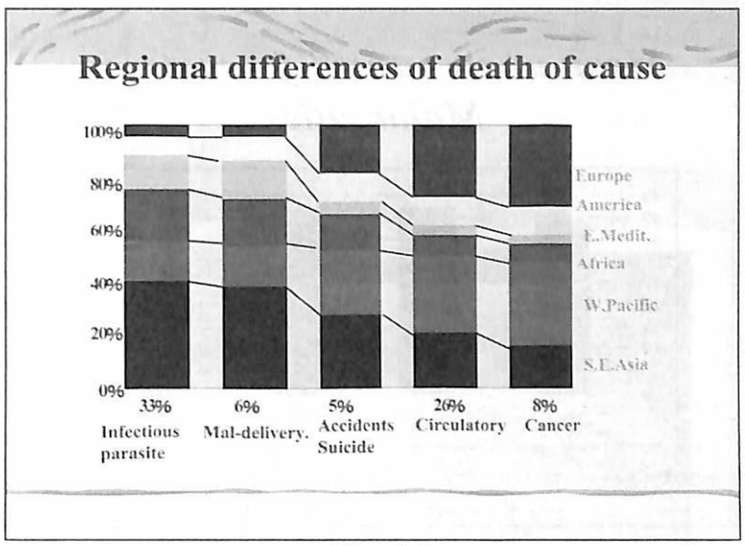


Fig. 4-4

With the difference in availability of the access of safe water supply and sanitation, big differences in cause of deaths of among the developed regions and developing/ under developing countries are observed.

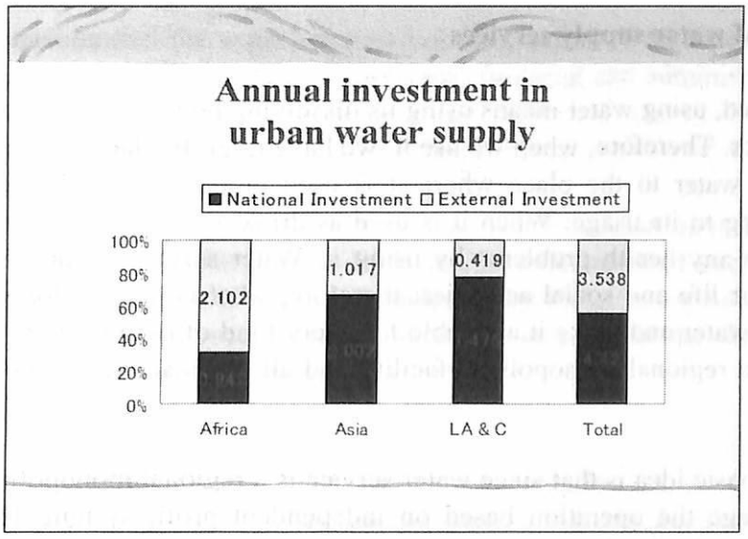


Fig. 4-5

It is reported that there are 4 billion cases of diarrhoea in the world every year, with 2.2 million deaths, mostly among children under five. Safe water, adequate sanitation and hygiene can reduce diarrhoeas disease by between one-quarter and one-third of these cases.

Annual investment in urban water supply during 1990-2000 was about US$ 80 billion.The ratio

of national investment and external investment in Asia and Latin Americas is higher than that of Africa. However, it is said that most of developing countries has devoted national investments to urban water supply. Most member states in the OECD have provided strong support for developing in efforts to improve water supply and sanitation sector.

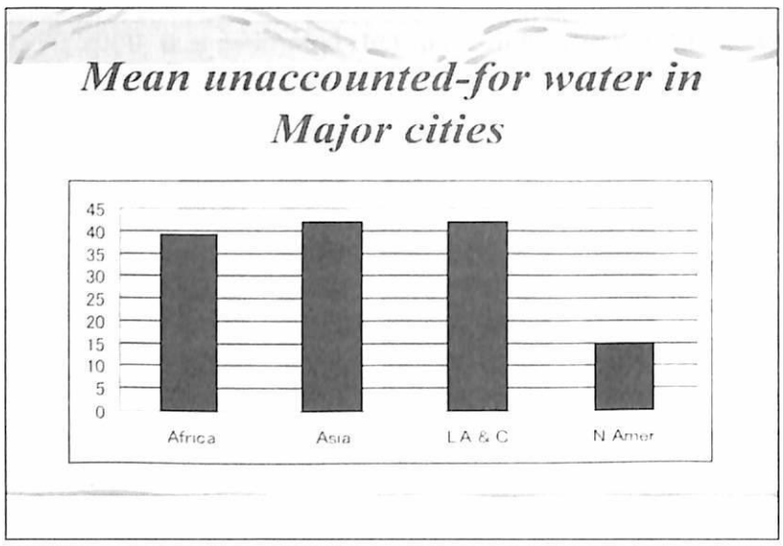


Fig. 4-6

The proportion of developing assistance to these sectors increased steadily in 1986-1996, rising from 3.4% to 6.6% of total assistance. Among the member countries, Japan and Germany were particularly big contributors to the sector, such that Japan invested over US$9.5 billion during 1986-1996.

5. Sustainability of water supply services

As above-mentioned, using water means using its dissolving powers, transportation powers, and heats characteristics. Therefore, when we use it, we have to go to places where there is water or we have to carry water to the place where it is used or needed. And, the water has to be processed according to its usage: When it is used as drinking water, it should be processed in order not to cause any health problems by using it. Water service is the only way to supply water necessary for life and social activities; therefore, what is needed for water service is to constantly supply water and make it available for every kind of usage. Therefore, water service should be run by a regional monopolistic facility and all of its activities should be clear to all service users.

The international basic idea is that since water service is a regional monopolistic business, local governments manage the operation based on independent profit system. However, from the cases in France and England, it is internationally considered to be effective that businesses, which have difficulty in securing financial and technological resources, use private resources to improve the water service. Accordingly, private participation in water service is encouraged, and international financial institutions, including World Bank, now put a financial condition of private participation as one of their financial conditions towards developing countries. In such a situation, all the information on water service, including water service charge as well as cost should be clear to everyone.

Either public services or private activities in urban water supply the sustainable development can be achieved by the best practice such as water resource conservation, human resource management, facility maintenance and preventive measures. The contamination of distribution pipelines may arise from the intermittent water supply, low water pressure, leaking pipes and inadequate wastewater collection system. Among them, the leakage of water from pipes is the most serious for sustainable development of the system as well as the safe water supply. However, the most of developing countries are faced with the serious unaccounted- for water as you can see from a graph below.

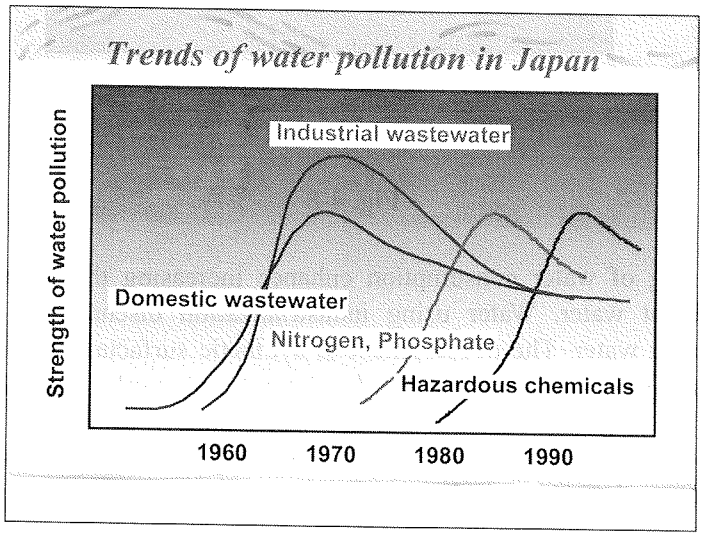


Fig. 4-7

The reduction of unaccounted-for water requires coherent action to address not only technical and operational aspects, but also institutional, planning, financial and administrative issues.

6. Water resource management

It is obvious that since water service exists in the natural water circulation, it should be based on the size of water circulation in that region. In Japan, in order to meet ever-increasing water demand, increasing service ratio and water consumption by the citizens, better water resource facilities must be developed. However, many pollutants have polluted the water environments. The causes of water pollution are listed as follows.

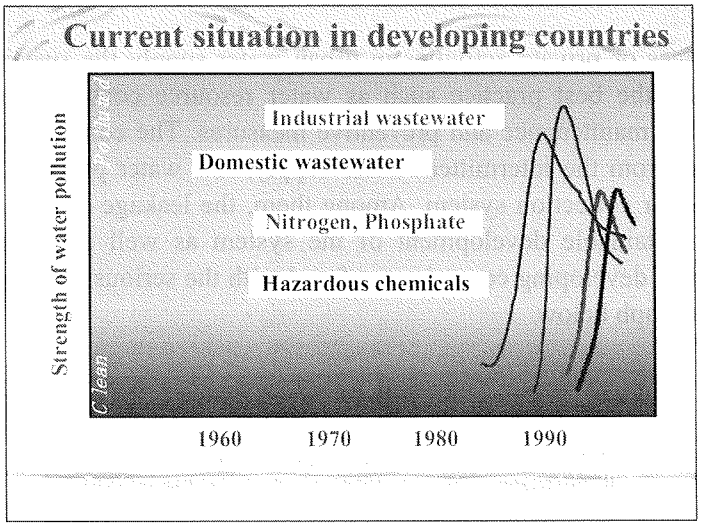


Fig. 4-8

Because of increasing of water consumption enhance increasing the amount of wastewater discharged to ambient water. Water using industrialization discharges a large amount of wastewater to ambient water. The development of synthetic surfactants added the phosphorus for domestic and industrial purposes and the development of synthetic fertilizer increased the nutrients of algae in stagnant water bodies for water supply as well as coastal sea. The development of synthetic chemicals has provided many benefits to domestic and industrial development; however, those chemicals have eventually reached to ambient water bodies. In order to cope these water pollution the Japanese government has set regulations and enforced them about every 10years, and the water resource management has prevented a serious situation, that they might have been caused with economical development in these decades.

7. Conclusions

However, looking into the water environment in many newly industrialized countries, especially in urban area, they are facing all the water pollution problems at once by the population growth impacts and industrialization. It is difficult to directly apply the methods used in industrialized countries to developing countries or newly industrialized countries. It is necessary for us to support and establish a suitable standard or regulation for each country, considering the nature, culture, science and technology of each country. Water resource is limited, but world population is increasing every year. Advanced countries, including Japan, are dependent on developing countries for food, and by importing food, we import water resource, which is unevenly scattered in the world. Thus, advanced countries are deeply involved in global water circulation. We must cooperate for the effective use of limited water resource for the provision of healthy living environments as well as the productive agricultural land with the green water.

"Regional Dimensions of Urban Water Management in the Asia and Pacific"

Mr. Yuri Steklov
Economic Affairs Officer
Water and Natural Resources Section
UN ESCAP Bangkok

Thank you Madam Chairperson for introducing me and giving me the floor. Distinguished Participants. Ladies and Gentlemen. I am deeply honoured to make this presentation to address the issues of water supply and sanitation in urban areas. Because I am the last speaker on the list, some repetition and overlapping are inevitable and a multitude of issues have been provided by the previous speakers, Madam Yamamoto and Professor Magara. I will try to minimise all of these overlapping and repetition, and will slightly go into interpretations of this information and data.

In my presentation, I would like to focus on regional dimensions of urban water management in Asia and the Pacific. There are obvious trends of unsustainable water development in Asia and the Pacific. First of all, you can see that there is diminishing water level. Secondly, water use is steadily increasing. All of these trends result in expansion of water scarcity throughout the region. The more serious challenge in the region is water supply and sanitation crisis. The share of Asia in global water availability is about one-third, which means that one-third of global water resources, renewable freshwater resources, are available in Asia: Approximately 15,700 cubic kilometres. While Asia is home to 60 percent of the world's population, it means that per person, in Asia, water availability will be around 4,300 cubic metres per year. In this share, per capita water availability has been steadily decreasing with the growth of population.

At the same time, water use is increasing. For the past 50 years, water use increased approximately by 3 times. Now, it is roughly estimated at 2,300 cubic kilometres per year. Water use will be growing in the Asia and Pacific region, because of population growth; more water will be needed for growing population, an expansion of agriculture, especially irrigated agriculture, and industries.

Initial water availability and increase in water use resulted in water scarcity. Water is a limited resource, and this resource should be effectively managed in order for everyone to benefit from it. For Asians, about 5,000 cubic kilometres of water could be used, and the rest of the water go straight to the ocean.

There is a nice saying by one of the ancient Sri Lankan kings that "No drop of water should go straight to ocean without use." It shows a very careful attitude towards water but unfortunately it is not possible because part of water should be left in water streams for environmental reasons. Also, a large portion of water, approximately half, goes straight into the ocean during the flood season. This water cannot be harnessed. That is why out of 3 drops of water available on the surface; 2 drops will go straight to the ocean without use.

Out of these 5,000 cubic kilometres of water, you can see that approximately half of water is already withdrawn for various purposes. In the report, an issue was presented to the United

Nations' Millennium Summit which was held in New York in September 2000. It is an explanation of the situation of water resources and freshwater resources. If the present trend of freshwater consumption continues, two-thirds of the world population would live in a water-stressed condition in 2025; it spoke specifically about water in cities. Cities consume from 5 percent of water in developing countries where agriculture is still predominant, to 50 percent of water in industrialised countries. Water is used by cities for domestic, municipal, commercial and industrial purposes. Water use is dramatically increasing with urbanisation--a very rapid urbanisation, and demand on water in urban areas very often exceeds available water supplies.

For cities, consumers of water, drinking water supplies and sanitation are the first priorities. Why water is supplied to cities? First priority of developing plan by any government--city government, local government, and national government--is given to provision of water supply--drinking water supply and sanitation. Then, water is used in cities for industrial and commercial activities. And water, of course, is needed in order to meet environmental needs.

The more water is brought to cities, the more waste water will be discharged from the cities. Cities are the greatest polluters of the aquatic environment. They pollute aquatic environment with sewage, municipal waste water, industrial effluents, polluted urban runoff, even drainage water which is collected from urban areas. Very often, all of these effluents or sewage-polluted runoffs are discharged off to rivers and to the ocean without proper treatments.

Only a very small part of polluted waste water that comes out of cities is treated, and the rest is discharged without proper treatments. This pollution affects the aquatic ecosystems and the marine environment. Discharge from urban areas is considered the greatest polluter of the marine environment. Also, this waste water affects sources of potable water supply for people living downstream of the cities.

This morning, I talked a lot about public health and effects of pollution, especially by heavy metals, on health and quality of life. To summarise the situation of urban water and urban water management, I say that the main concern is sustainability of water supply of suitable quality. Not only in terms of volume of water, but also concern about the quality of water. How to provide, for example, drinking quality water to the population, or certain quality of water for industrial purposes or for commercial purposes. Shortage of water would become a major limiting factor in socioeconomic development in urban areas. In fact, shortage of water is already limiting development in many cities throughout the region. For example, Singapore is very selective before giving permission for some industries to be placed in the city. First of all, they make assessment on how much water will be needed for the new industry. After that, they consider the request against available resources and permission may not be granted when water is not available. There are some other examples where their growth, their development and their quality of life is already limited because of the shortage of water resources.

The main problem facing governments--local governments, city governments, and national government--is how to ensure, on a sustainable basis, adequate water supply to cities, and how to prevent water pollution, and how to stop depletion and depravation of water resources.

There are several possible response strategies to meet these concerns. First is traditional, a so-called "supply management strategy," which is development of new supply sources. This approach was used for many years in history of our civilisation. If demand arises, the next step

would be how to provide additional water to meet this demand. But unfortunately, this management option is limited, because all sources of water, which are affected conventionally nearby the cities, are already developed. In order to develop new sources of water, you need to invest a lot of money. Sometimes, new sources of water are located hundreds of kilometres away from the consumers. In such cases, you need to invest for transporting water to the consumers.

The second option is allocation of water from agriculture. Agriculture is the largest water user. You already know that in some agriculture-dominated countries, approximately 95 percent of water is used for agricultural needs. The allocation of water from agriculture is inevitable. Water will be taken from agriculture and diverted to urban areas for consumption. However, quite often, this option is not socially acceptable for it is a very sensitive issue. Of source, from the point of view of economics, it will be more beneficial to bring 1 cubic metre of water to a city, because this one cubic metre of water will be sold for one dollar to a user. At the same time, 1 cubic metre of water in agriculture would generate, let's say, 1 cent. There is one hundred times difference in generation of income. Nevertheless, we cannot make our choices based only on this economic calculation. Social issues should also be taken into account. Water is the basis for many rural people, especially in places where they use irrigated agriculture. Thus, water cannot be taken without any compensation from rural areas to urban areas.

In this connection, I would like to mention about a so-called "virtual water." Yesterday, in a presentation by Professor Takahashi, he mentioned that "virtual water" is not widely discussed. It is true. Trade of agricultural products is trading of water as well as fertilisers, energy and so on. Again, we cannot only rely on economical considerations. Social issues should also be taken into account when we are talking about allocation of water from agricultural areas to urban areas.

One of the most practical management strategies would be more efficient use of available supplies. It will be much cheaper in many cases to use economically, and use wisely the available water supply. Through water conservation, saved water can be used to provide people who have no access to water supply and sanitation. Another benefit of more efficient use of available water supplies is minimisation of untreated water discharges. If less water is brought to cities, then less waste water is generated in the cities.

Conservation and efficient use of water will be identified as primary means of achieving water security in the 21st Century. This recognition was made in the ministerial conference which was held in conjunction with the Second Water Forum in the Netherlands in March 2000. Water security means that aquatic water systems are protectedand improved. Sustainable development is promoted and everyone has enough access to safe water at affordable price. There is a need to promote water conservation. In many countries of the region, legal institutional framework for consolidated water conservation management is absent. That is why there is a need to introduce some water conservation issues to overall water management policies. It is a very basic matter but nevertheless it should be done. Unfortunately, water conservation issues are not addressed clearly in policy documents in many countries. Even if water conservation policies are formulated, they are not translated into action; it is another problem in promoting water conservation. Very often, legislation in the institutional machinery for implementation of water conservation policies is inevitable. However, there is a

shortage of financial resources for implementation of water conservation policies.

There is a striking difference between energy conservation activities and water conservation activities. If you look at energy conservation activities, they are very well established in many countries of the region because there was a need to save energy, to use energy more efficiently. Many countries have very well-developed legislation and institutional machinery in order to promote energy efficiency and energy conservation. In many countries, there are water conservation centres that are supported by governments and international agencies, for example, JICA, which is a Japanese agency. It is very active in promoting energy efficiency and energy conservation. For example, in 2 months from now, we are organising a seminar in Turkey on energy efficiency issues at the centre which was set up with the help from JICA in Turkey. They invested a lot in order to promote energy efficiency.

But unfortunately, such is not the case with water. I do not know many countries which can say that they have water conservation centres. Only in Singapore, there is a small room, which is called water conservation centre. In some developing countries, they have not even started any activities for promoting water conservation and water efficiency. From the point of view of the future water resources, there is only one way to get out of the existing water crises--to use water more efficiently and to conserve water.

There are several options for water conservation management. One of them is conservation of domestic and municipal water supplies; for example reduction of water losses. In some cities, water losses are accounted for about 50 percent. It is a first priority, because the pipe supply is reduced due to leakage from water pipes. Another option is minimisation of industrial water use. There are different approaches for the production of the same product. One technology could use plenty of water (let's say one cubic metre of steel or one ton of steel) while other technologies with water savings use much less water. The problem is, in order to introduce new technology, a lot of money has to be invested. Twenty-five years ago, I was in Sweden and I saw how they changed the technology for production of paper. They blew up a whole factory and built a new factory. Investment was enormous in this case, but the new factory, of course, has new technology and used much less water.

Another option, which is now quite popular and increasing is waste water reuse and recycling. In many countries, waste water and sewage coming from cities could be reused for irrigation purposes under special conditions, and for certain crops after some very simple treatment. It is a reuse of the same water without taking fresh water from other sources. Another example is recycling with different kinds of technology; certain volume of water is circled through the same technological processes for cooling towers. For example, there are several alterative sources of water supply such as sea water. Sea water has certain applications, such as for cooling towers and for industrial water supply in certain places, and it is already used in Singapore, and I believe in Japan also. Rain water harvesting is another example. Rain water harvesting has become very popular, not only in developed countries, but also in developing countries. For example, in Indonesia, there is a nationwide program, on how to use rainwater for domestic purposes in order to reduce the intake from pipes. In Germany, there is also a trend now to collect rain water in rural areas from roofs of the houses and treat it with a very simple way, and then use for domestic purposes such as toilet flushing.

I did mention here about desalination. Yesterday, Professor Takahashi talked about

desalination. But desalination is a very limited option. It could only be used in water-deficient areas and mostly for drinking water purposes. Also, desalination requires a lot of energy. In order to desalinate water, you need a lot of energy to create pressure in the chambers for water. Desalination is a limited option, even though the cost of production has dropped dramatically. Recently, I got some information from the water commission of Israel, which is commissioning a desalination plant, the largest plant in the nation near Haifa. It will produce desalinated water at approximately half a dollar per cubic metre. Of course, it is an improvement in the efficiency of this desalination plant, but nevertheless this option is limited for water deficit areas, for drinking water supply and requires a lot of energy.

Water conservation could be promoted in different ways. First of all, economical incentives should be used in order to promote water conservation. Progressive tariff rates for water supply--the more water you use, the more you have to pay, progressively--should be introduced. At the same time, in order to encourage industries, to replace their obsolete technologies for water supply, some subsidies should be created for those industries to introduce water saving technologies.

Secondly, legal instruments are needed. I already mentioned that in many countries, there is no well-established legal framework for water conservation. There should be special laws for water conservation: Special regulations, building codes. For example, building codes could mandate that certain water saving appliances should be used only. In Singapore, it is now prohibited to install toilets with flushing volume of more than 6 litres, previously, they used 15 to 20 litres. It is one of the measures that could be implemented through legal instruments.

Also, some administrative measures can be taken. For example, rationing of water during the drought season, or even prohibition of use of water for certain applications can be placed, for example washing cars, could be fined, if somebody used during the dry season.

Also, very important elements in promotion of water conservation are public information and education. Public campaigns should target on water conservation. After knowledge is given to general public about the value of water, importance of water for the life of people, for water supply (they don't know how much it will cost to provide 1 cubic metre of water to their places,) it will be some motivation for them to conserve water. At the same time, educational programs prompt changes in water use practices. These educational programs are very effective in schools. There are some examples of organising such kind of educational campaigns in schools. For example, in Australia, and Singapore, it is estimated that up to 15 percent of water could be saved at homes because of these educational campaigns. Also there is a psychological factor. When your child comes home from school and says to you that you are doing something wrong with the use of water--that you should not use water in this way—you will feel ashamed and you try to close the tap or use water more rationally; it helps a lot. There are plenty of educational materials already created by private companies, by governments, by international organisations--they are very useful for promoting water conservation at schools.

Information campaigns on the value of water are very important for mobilization of public support for new water policies, even for specific projects. Because, if the government says that "You will change our policy," or "we are launching a new water project without giving any information about why it has been done, what is the purpose of the project What are the benefits of the people from this project?" Such projects will be met with resistance. Such

water policy, will not be supported by the people. Such kind of information campaigns is especially important for introduction of new tariffs. New tariffs must mean the right tariffs for people to give their support. But you cannot say that starting tomorrow, people have to pay 20 percent more for your water. Rather, the public should be explained why they will pay 20 percent more; for instance, for better services, better quality of water, 24-hour coverage instead of 6-hour coverage per day.

ESCAP, my organisation, which is a United Nations regional forum for Asia and the Pacific, is organising different kinds of activities in order to promote public awareness of importance of water resources. Recently we published a guide to promote public awareness. This guide is available on display at the entrance, a blue book. We published this book 4 months ago, but this book has already been translated into Bahasa, and was launched on 21 of March in Jakarta at the meeting of national ceremony for the World Water Day. Also, the translation of the book is under way into Farsi, the language in Iran, Chinese and Russian. This book is our organisation's contribution to the International Year of Fresh Water. According to the resolution adopted by the UN General Assembly, the next year, 2003, is declared as the International Year of Fresh Water in order to promote awareness and knowledge about the importance of water resources for our life, and for industrial purposes.

Also, we are organising some training activities for capacity building. These training activities assisted by Japan--we are very grateful to the Government of Japan, and this book has also been published through its financial assistance. We are also going to organise sub-regional and national seminars in the region. We enjoyed support from the Government of Singapore as well for materials collected for our book and also for organising different kinds of events. Training activities are normally very responsive to our requests for sending resource persons because, from my point of view, Singapore is the best place in terms of water conservation in the region.

ESCAP is also collecting, promotional materials like school books, teaching aids, posters and films from various countries of the region. We have a good collection of such kinds of books and films, and are ready to share this with other countries. Since we have permission from the authors to translate and reproduce in various ways.

The most serious challenge in Asia is the water sector; How to provide water to 670 million people with access to safe drinking water, and to almost 2 billion people in Asia without hygienic sanitation. This data was also taken from the Global Water Supply and Sanitation Assessment Report. This report was referred to several times this morning. It was compiled on the basis of national reports from 150 countries. National teams worked very hard in order to collect all of these materials and put them together. But the problem is the statistics because each country has its own statistics. You can see what's improved water supply and what is not improved water supply varies according to each country. In this case, one type of service that may be acceptable for one country is not acceptable for another country. That is why all of these figures are very approximate. Nonetheless, it gives a very good impression of general trends—it is not an absolutly correct figure but shows most trends.

In this light, I would like to refer to the question that was raised by our colleague from the Philippines. He asked what kind of mandate was given to governments and what kind of responsibilities were given to implement this target. This target, to halve by 2015, the

proportion of people who are unable to reach or to afford safe drinking water, was incorporated into the United Nations' Millennium Declaration. This United Nations' Millennium Declaration was adopted at the Millennium Summit which was held in September 2000, where presidents and prime ministers from 140 countries attended. It means that now full responsibility for implementation is with national governments and so as the role of United Nations and other international organisations, donors, and assisting countries in achieving this goal. In the declaration, the target of reducing the number of people without access to water supply was incorporated. Later, in December of last year, at the Bonn Fresh Water Conference, there was another provision to halve the present proportion of people lacking access to improved sanitation by 2015 was incorporated. In this connection, a meeting which will be held in South Africa and a provision probably will be also adopted by the governments and will become another target for national governments to achieve.

Next slide shows the tables that are similar to the ones shown by Ms. Yamamoto: Coverage of water supply for urban population. But I put all of this data and information in a graph. I think it will be more readable. I do not want to quote many numbers and figures. But nevertheless it shows the trend. First slide shows the water supply coverage of the urban population.

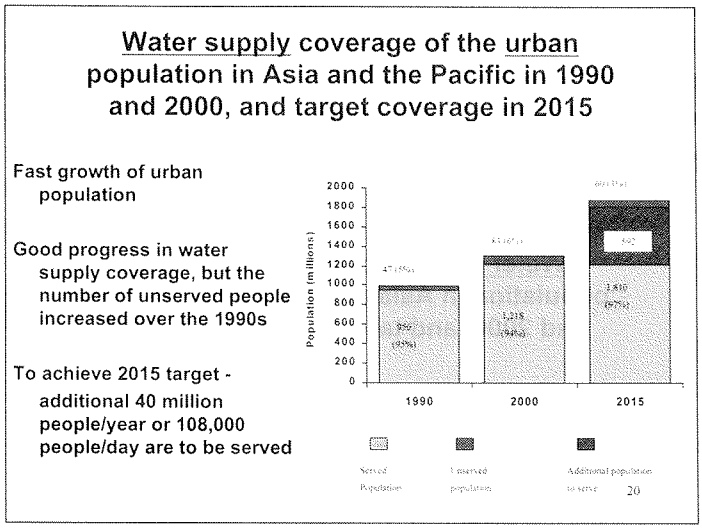


Fig. 4-9

You can see from the slide. These lines that are part of the graphics show the population that should be served by 2015 in order to achieve the target of the Millennium Declaration.

First of all, there is a fast growth of urban population that could be noted from these graphics. Urban population growth for the last 20 years increased from 1 billion people to almost 1.8 billion. Good progress in water supply coverage has been achieved. Nevertheless, in spite of huge investments in the urban water supply sectors, the number of unserved people has increased over the '90s for the last 10 years, from 47 million people to 83 million people. To achieve this target of the year 2015, to halve the number of people without proper supply, additional 40 million people should be served per year for the next 15 years.

The next graph shows the sanitation coverage of urban population.

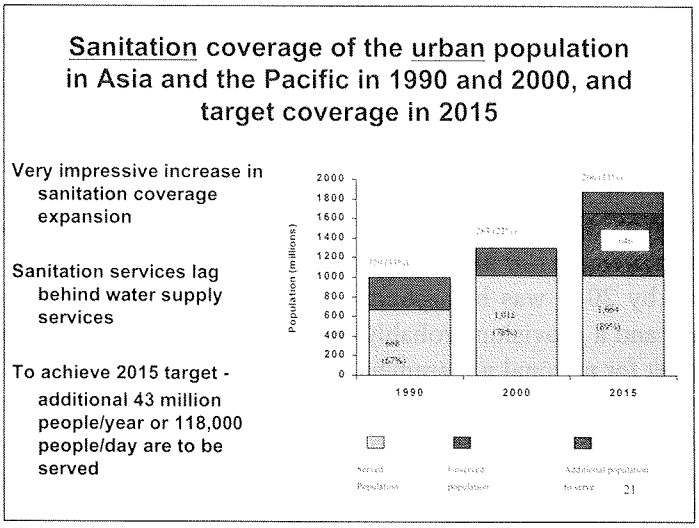


Fig. 4-10

You can see that there is more unserved population. More people don not have access to proper sanitation services. Very impressive increase in sanitation coverage has been achieved for the last 10 years. But nevertheless, sanitation services left behind water supply services. In order to achieve the target by 2015, 43 million people should be served every year. The 2 next slides show water supply in rural areas.

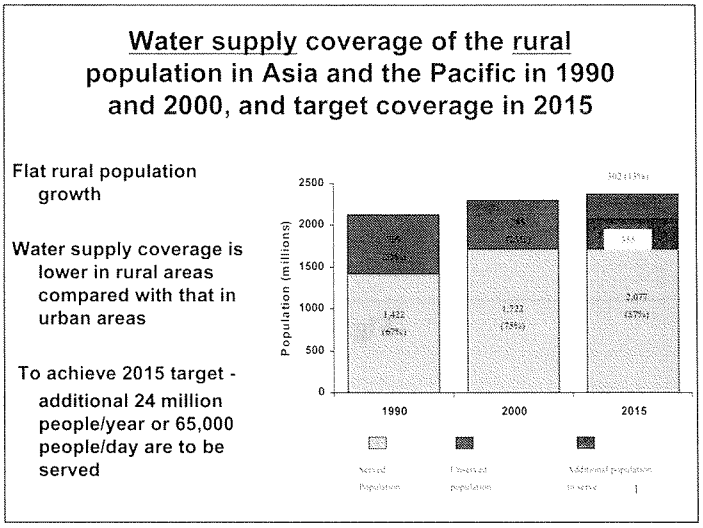


Fig. 4-11

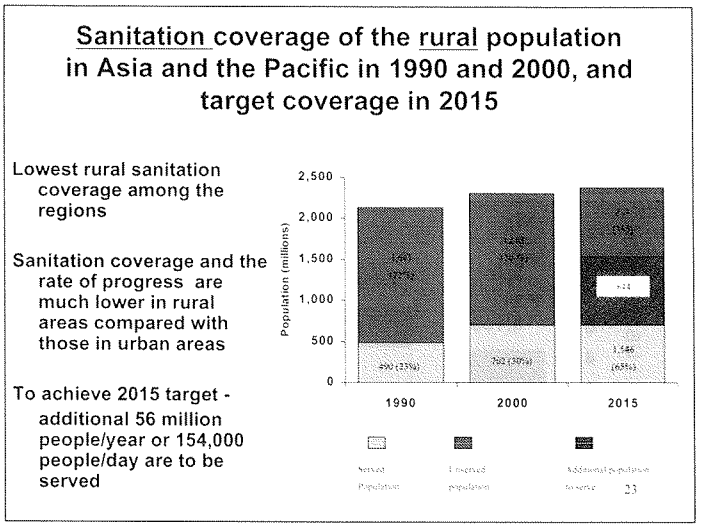


Fig. 4-12

You can see more unserved population, but nevertheless, there is a quite good coverage of water supply in rural areas. But very fast rural population growth has becomes a very serious issue.

In regards to the water situation and sanitation coverage, you can see a plenty of unserved population. You can see the enormous tasks the governments are facing now on how to improve sanitation coverage of rural population in 15 years.

I will mention very shortly about the causes of crises. In spite of tremendous progress which was achieved in provision of water services and sanitation services for the last decade, you can see that plenty of people are in search of water supply and sanitation. The main problem was the very low initial level of services, then insufficient progress has been achieved over the last 10, 15, 20 years. The rate of water supply coverage in urban areas was less than the rate of population growth. In other sub-sectors, rate of improvement kept pace with the population growth rate, and of course, enabled capacity of many countries to manage the water supply sector, to operate efficiently water supply and sanitation facilities, and to use proper technologies for water supply and sanitation. One of the major problems is that countries do not have enough funds in order to invest in water supply and sanitation.

The Asian governments on average invest only 3.6 percent of the government spending on water supply and sanitation, whereas in America, investment by government is 2 times more--more than 8 percent. Also many governments depend on external investment for improvement of water supply and sanitation.

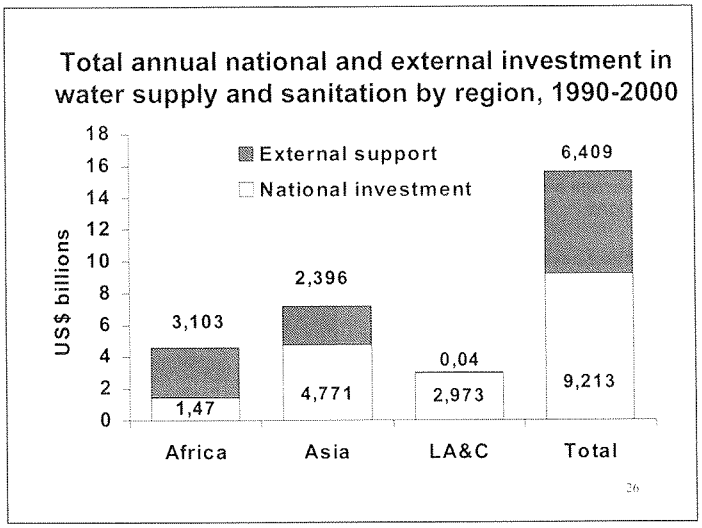


Fig. 4-13

Unfortunately, sanitation sector is not favoured among investors. Much less investments come to sanitation compared to the water supply sector.

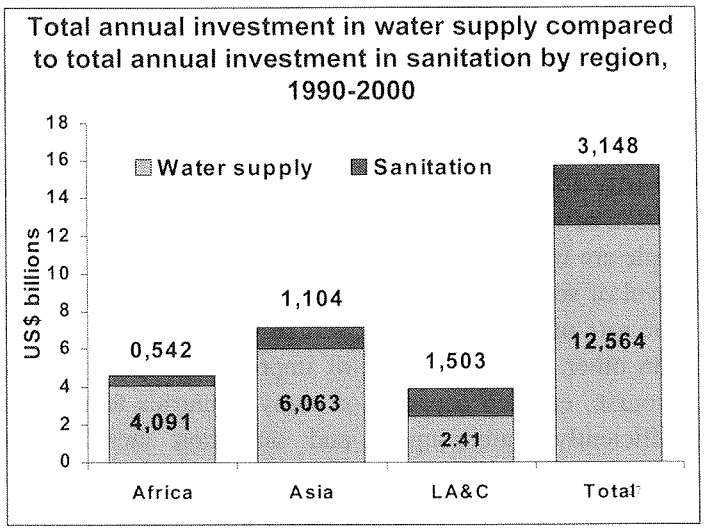


Fig. 4-14

And tariffs that are collected for water supply and sanitation are not sufficient to cover production costs in many cases.

You see this graph that was used by Professor Magara. It shows the proportion between national investment and external investment. In Asia, approximately one-third of the funds come from external sources, and two-thirds from domestic sources. It is also a very interesting graph. The proportion of investments into water supply is shown in blue and investments in sanitation are shown in brown colour. In Asia, sanitation receives approximately one-sixth of investments that come to the water sector. This graph shows that water supply and sewage tariffs and their average by regions.

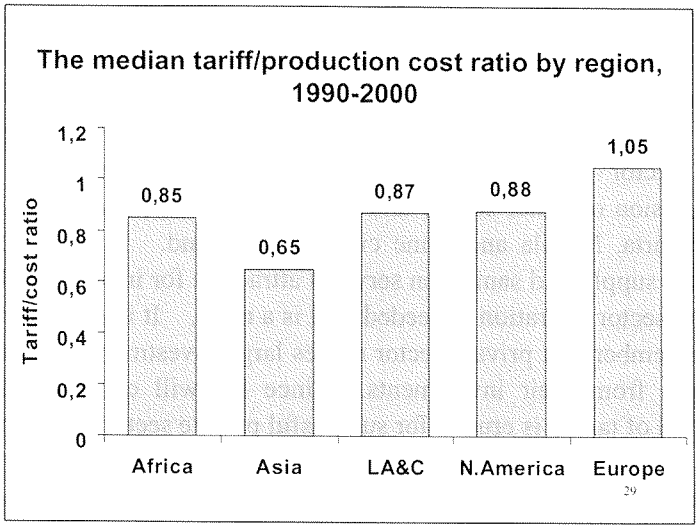


Fig. 4-15

In Asia, you can see that the tariffs are the lowest. Only 22 cents average for provision of 1 cubic metre of piped water and 14 cents for sewage.

This very crucial graph shows the proportion of tariffs and production costs.

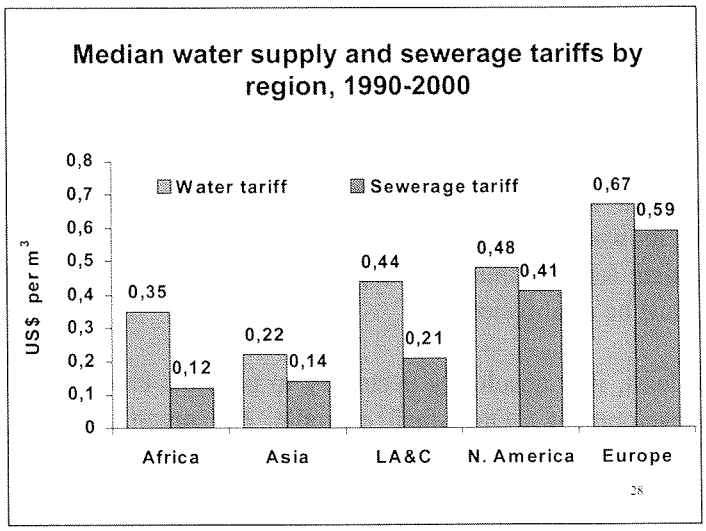


Fig. 4-16

If this ratio is more than 1.0, it means that tariffs are high enough to cover the production costs. If it is less, it means that tariffs are not enough to cover the production costs. The ratio is lowest for Asia. You can see that in Asia only 65 percent of the costs of production of piped water are covered through collection of tariffs and 35 percent comes in the form of various subsidies.

Another issue which was raised yesterday is private sector participation in delivery of water supply and sanitation services. In fact, under private sector participation, there are two

different kinds of involvement. There are large private utilities companies, which means that they have commercial operation and expect to get some profits from these operations. And there are community-based organisations at the local level that engage in charity activities. The purpose of involving private sector is to improve the efficiency of operations, and to get access to private sector funds. The most recent successful examples of private sector involvement in provision of water supply and sanitation in Asia, concessions for water supply, can be found in Jakarta, Manila and some cities of Thailand. In order to engage a private sector, to make water supply and sanitation services attractive for investment from private sector, regulation of private sector operation is needed. It is a must. It is a major requirement. And also you have to remember that private sector makes large investments and receive some profit, let's say 15 percent, from their investments. Since his will come in the form of tariffs, establishment of level of tariffs is crucial for successful private sector operation in any country.

When we are talking about tariffs, we have to remember that water supply is not only a commercial activity, but also a social service. That is why subsidies in the near future are absolutely necessary in many countries.

Also, I would like to say a few words about the role of parliamentarians. It will be a bridge to the next session where you will talk about the role of policymakers. What should be done by these people who have powerful tools in their countries in order to achieve the water-related goals of the Millennium Declaration? In my opinion, first of all, they have to promote creation of enabling environment for action in order to stop unsustainable water exploitation and to improve access to water supply and sanitation services. This environment for action could be done through policy formation and reforms. In many countries, policies need revision to reflect current realities for they are outdated in many cases. The first step can be taken by the review of available existing legislation; and then, we can decide on what kinds of action should be taken to make changes in the sector.

Secondly, attention shall be given to institutions dealing with water supply and sanitation services. In general, its water management should be established or revised, also institutional frameworks, mechanism for coordination, for promoting autonomy and accountability of water supply institutions must be established.

At last, but not the least, it is absolutely necessary to promote capacity building for planning management and development. One small example; My organization is involved in water management issues and is assisting countries in Central Asia on how to manage and share water resources. There are no training experts on the international water laws in those countries of Central Asia. Thus, primary attention shall be given on how to train in short time these people who could work together with local governments and parliament in order to promote proper laws.. The training should teach on how to implement those laws to improve the situation with shared water resources in Central Asia.

Thank you for your attention.

Discussion

MS. HOARE
Thank you Mr. Steklov. Both of those presentations complemented each other well. Professor Magara is coming back up here to answer any questions. Can I remind the delegates that we only have about 15 minutes, so if you have any questions, if you could keep them brief. Thank you. Do you have any questions?

CHINA
I would like to say something. You made a very successful and very interesting lecture about the utility of water. I would like to raise a question. In some cases, it is not only the bad quality of water, but it is also that there is no water. They do not have the condition to have water. So they have to move the people from places to places having water. I would like to ask the experts, how you comment on this kind of policy. Another question is... I would like to ask Professor Magara. You mentioned that from 1960 to 1972, some measures to control some diseases, cholera... Polio? Do you think that if management of water is good, polio can be controlled?

MR. STEKLOV
Thank you for your question but, frankly speaking, it is very difficult to give a general reply that is applicable to any case. You should consider case by case. You should ask questions like are they near alternative source of water? What should be done to bring water to certain areas? In China, for example, there is a large water transport project that is under implementation to bring water from southern part of China to northern part of China in the Beijing area and Tianjin area. Also, at the same time, it was a decision by the People's Republic of China to introduce very strict water conservation matters, not only to bring some extra water to the north, but this extra water should be used very wisely. They are promoting water conservation and managing supply at the same time. We had a very good seminar in Shanghai few months ago about water conservation issues and all of these things were discussed. I believe it should be considered case by case instead of looking for a very general reply. Thank you.

DR. MAGARA
First point, talking about the Tokyo Metropolitan Area. We have about 1,000 millimetre precipitation, but that is not enough. Therefore, Tokyo Metropolitan Area has to introduce another 1,000 millimetres from other areas. That way, we are developing the water supply system in this area. We have never immigrated to other areas.

By the way, regarding the polio, after World War II, foreign military and their families carried polio virus to Japan. Therefore, we have very much suffered from polio from 1945 to 1955. In order to cope with polio, the government has developed to improve the management system for controlling the polio virus. But that system did not succeed completely. We had to wait for the polio vaccination that started in 1963 or 1965. After that, vaccination of polio virus in Japan succeeded in eradicating polio. Thus, complete eradication was not caused by the provision of water supply and sanitation system.

MS. HOARE
Are there any further questions? Indonesia.

DR. CHANDRA
I am Surya Chandra from Indonesia, Member of Parliament and also a physician. Water supply is closely related to health. Could you mention the function of the Ministry of Health in that case? Because especially in Indonesia, the function of the Ministry of Health is only to cure diseases and build hospitals. But to prevent diseases, you need good supply of drinking water. So I think that it is the function of the Ministry of Health as well. What is your comment?

DR. MAGARA
Talking about the Japanese Government, the water supply activities are regulated by the Waterworks Law under the Ministry of Health and Welfare, which corresponds to the Ministry of Health in your government. So I have been very much committed to the Japanese water supply project. Engineers are very excellent in water supply engineering but sometimes we have faced serious discussion on how water supply project can reduce water related diseases. Therefore, I think a part of the water supply project should be committed by the Ministry of Health and Welfare or the Ministry of Public Health. That is my idea.

DR. CHANDRA
It is said that scientific solution is not available for the developing countries in order to protect health-related hazards and also the water management. Could you help all the developing countries with a comprehensive scheme involving the health department, water resources and maintenance management, and also the regular maintenance materials so that all the developing countries will be benefited by that? Thank you.

MS. HOARE
Thank you delegate. That was the last question.

I would like to quote some words and some activities performed by WHO. Now WHO is going to revise the WHO Drinking Water Quality Guidelines. I am a member of the Expert Committee. In the next WHO Drinking Water Quality Guidelines, we are going to develop a protocol for developing a national drinking water quality standard.

A national standard shall reflect country's conditions--natural, social, cultural and financial conditions. In order to develop an appropriate or affordable national standard, we must cooperate with each other to know the actual situation of each country. Therefore, WHO is going to develop the protocol for developing national standards.

DR. SAROJA
Before you draft the policy regarding the specific project, would the WHO come forward to get the information from all the developing countries so that, based on the materials and the statistics available, WHO will come out with the positive directions and solutions?

DR. MAGARA
There is also participant from your government; Mr. [Hainen??]. He is a WHO representative of that area. We are very anxious to cooperate with your government as well as with

Bangladesh, Nepal and other countries in the region. We have received much information from your country and other countries. Thank you very much.

MR. STEKLOV

Regarding this comprehensive scheme for water management and water supply in some cities, you know that the United Nations and various organisations affiliated with the United Nations are promoting the so-called integrated approach to water management--a great approach which will cover all state quotas involved in water management and water supply. Also taking into account the needs of water users. There are many aspects of integrated water resource management. One of them is a creation of a viable legal institutional framework. In many countries, there is a fragmentation of responsibilities for water management. For example, in Thailand, where we made a start a few years ago, we found that there were about 40 ministries and agencies assigned to water management without proper coordination. Now there is a national committee on water resources that were set up by the Prime Minister's Office trying to coordinate activities and work together to eliminate overlapping and give proper functions to each agency involved. There are many options for introducing some improvement in water supply and water management. But unfortunately, there is no single scheme that is applicable to everyone, to any country. In the case of India, for example, we are working together with the Ministry of Urban Development. They received some information from us and we are trying to introduce this comprehensive management of water resources to some urban areas for their water supply. Thank you.

MS. HOARE

Thank you Professor Magara and Mr. Steklov. I am sure the delegates would like to share their appreciation for their time and input for their presentations.

SESSION V

Panel Discussion

–Parliamentarians and Water Management–

Session V

Moderator:
Dato' Napsiah Binti Omar, MP (Malaysia)

MR. HIROSE
I would like to introduce Ms. Napsiah Binti Omar, MP, as the chairperson of the panel discussion. She was the Minister of National Unity and Social Development, and now Member of the Parliament of Malaysia and Deputy Secretary General of AFPPD

MS. OMAR
Thank you, sir. Very good afternoon to you. Honourable members, Ladies and Gentlemen. It is an honour and pleasure for me to be the moderator for the last session of the day, Session V. In this session, we will have a panel discussion titled "Parliamentarians and Water Management." After hearing all the lectures for the last 2, 3 days, the emphasis is on us now, as parliamentarians, to think what we are going to do when we return to our respective countries. We have only 2 hours and I have 5 panellists.

I would like to introduce my panellists. On my far left is Dr. Chandra Surapaty from Indonesia. He is a member of parliament and also a public health person from Indonesia. Next is Dr. V. Saroja from India, a medical doctor, and she is also a member of parliament. She has also worked with communities in rural areas in the Tamil Nadu State. On my left here is Mr. Yu En'guang, a member of parliament from northeastern China. He seems to be a very articulate man, and he was a journalist. We will hear from Mr. Yu En'guang in a few minutes. On my right is Ms. Phillida Bunkle, an MP from New Zealand. She has got a long list of achievements. What I will say is that she will speak for herself. On my right is Mr. Emilio Macias from the Philippines, an MP and also a doctor. We have 5 representatives and let's hear what they have to say. I will give each one of you 15 minutes so that we can accommodate everybody. I hope that would be enough.

As usual I think I will give the ladies the chance to speak first. Dr. Saroja from India. You have the floor.

DR. SAROJA
Thank you, Madam Chairperson, My Esteemed Colleagues and Fellow Parliamentarians. Ladies and Gentlemen. It is a great honour and pleasure to be here with you to share my views and learn from you. When I get back to my home, I would like to implement and carry home the message from this meeting. I apologize for my inability to be here on the first day. As all of you are aware, there was a very important piece of legislation in the Indian Parliament and voting was there. At the outset, let me congratulate the great country, Japan, for the per capita health expenditure to the tune of 1,382 dollars. This shows their great concern about the health issues.

Just now, the Empowerment of Women 2001 is concluded. The Empowerment of Women 2001 is for the social, political, economic empowerment of women. I will try to get the final note on this specific issue on how far we have achieve, on we have to achieve, and on what are the strategies in this regard.

Fifty percent of the population are women, all over the world. The current topic assigned to me is "Parliamentarians and Water Management." I may be permitted to say--women contribute to all works of life in every department, ministry, and scheme for the improvement, upliftment and achievement of any goal; for any country for that matter. According to UNDP's administrative definition, sustainable development empowers people rather than marginalising women. It is the development that is provided through women, through children, and through nature. Women do not yet determine their own fertility and still are in poor health, and this fact needs a deep concern.

The empowerment of women, to my observation, has a long way to go. Women are no longer a mere target group. They are active agents who can contribute in decision making, policy making, mobilisation of labour, provision of resources, determination and implementation of innovative strategies. By involving women, particularly in planning, designing, operation and maintenance of stages as well as complimenting health education programmes, water management and sanitation projects can expected to be more effective. It will achieve the ultimate objects of improved water quality, quantity and health, and active participation of women can lead to much needed development of women.

Madam Chairperson. I am a medical doctor and a parliamentarian. I am actually participating in the family welfare programme in my state and also in my country. The population in India is second in the world, but as far as the achievement is concerned, we are not ranking in spite of the population explosion. We are able to move in a positive direction, because India has introduced the national health policy and water policy for the whole of India; every province has got its own strategy, the method of implementation and also its achievement. I appeal to all parliamentarians to have a comprehensive national policy for every country so that they will help their regulation on the environment and sanitation; through all the inter-ministerial cooperation and coordination, we will be able to achieve our goal.

As far as the safe water is concerned, I will confine myself to the topic which I have been assigned to. The water policy that the Government of India has brought forth specifically classifies the following categories. According to the priority, the water management has got its place in the implementation and also the allocation of funds. In that respect, the first category is the allocation of water for drinking water purpose. The drinking water is a major issue for the health and other related subjects such as agriculture.

Next to the drinking water comes the irrigation for agricultural purposes. In agriculture, it should be prioritised according to the food production. The third comes the industries. Even among the industries, those industries that treat their effluents and sewage should be given top priority compared to those industries that do not have the facility.

Next comes the navigation. As far as waterborne diseases are concerned, it was debated in the morning in depth about the waterborne diseases and the infectious diseases. There are more fluoride, nitrate and other heavy metals--they affect the bone marrow, the skin system and the dental system.

I would rather impress upon the parliamentarians on this issue in developing countries, which are facing financial crisis, than all the countries, though we must keep in mind that all the

technology transfer are not uniform in all underdeveloped countries. Now the Government of India has researched the rain water harvest and it is given a deep thought. It is cost effective, cheap, and as for the method of collecting the rain water, UNICEF has come up with cheap technologies that are useful and can easily be implemented in the rural areas. They are also creating awareness among the local government, environmental and social groups, involving the government missionary, involving the local electorate representatives, and involving the rainwater harvest places to take a major role. Also, 80 percent of rural Indian people are able to understand the importance of rainwater harvest.

On this juncture, I would be proud to say that, recently I have arranged the meeting of rainwater harvest with the community participation, with the local government involvement, and with the electorate representatives, under the chairmanship of the district administration. I was able to take down the message of rainwater harvest to the grassroots level. In addition to this, the leader of my province, she has come out with the proposal of a comprehensive scheme involving all the government schemes under one roof to create awareness for the grassroots level.

In that way, the district administration has allocated small amount with the participation of self-help groups--there are many self-help groups that have come forward to contribute their ideas, their technology and how to protect the harvested rainwater within their home. Our leader has brought the government order that every house that is being constructed hereafter will have to have a provision for rainwater harvest. In that way, we are insisting, we are giving more trust on the rainwater harvest. I feel that we must take into account the cost-benefit ratio and the variations in technology from nation to nation. WHO, UNICEF and all the donor countries have to come up with the standard policy, programme, method and implementation so that all the developing countries will have uniform benefit of this rainwater harvest. With these few lines, Madam, I conclude.

MS. OMAR

Thank you Dr. Saroja. You actually stopped right on the dot--15 minutes. I will not comment on what you have said, but you have covered a wide area; you have talked about the rainwater harvesting, which is very good, and calling upon WHO and UNICEF to harness all the cheap technology and distributing to others. Thank you. Now I would like to call Ms. Phillida Bunkle from New Zealand. The floor is yours.

MS. BUNKLE

Thank you so much. I have learned a huge amount from participating in these sessions that we have had; both this and others. I thank the organizer for that opportunity, and I thank them for involving Australia and New Zealand, because I believe that it is very important that we move into a perspective which is more informed about near neighbours. Many of us come from European experience, and to learn more about the pattern of the world we really live in is for me, a high priority. So, I thank you for the opportunities that I have had. I know that I will go back from these sessions with a very clear idea of the problems that the world really faces. But, I am often feeling very ineffectual about how I can contribute. Thus, I want to start by saying that perhaps the insight that we need to hold onto the most is the fact that we are all in this together. In our very first lecture, we were told that out- of-space perspective showed that before people went outside nature, they were part of nature and natural cycles. I thought to myself, it took space travel perhaps to rediscover the truth that every indigenous culture already

knew, and perhaps that insight is the one that can be a starting place for whatever culture you come from--that however developed we are, we cannot stand outside the natural cycles that sustain us. The professor who gave us that first lecture made the point that this is after all the only earth we have.

So I take this as my starting place, and then the next professor gave us four elements that contributed to the current crises. One of those was the deterioration of our environment in the 1990s as we found ourselves accelerating the globalised market economy. We all find ourselves at fiercer competition to make cheaper goods. As we compete against each other, we reduce our labour standards, we undermine environmental protection, we use more land and resources, and we borrow from future. Somebody raised the issue of underground water. It is, of course, mining underground water that is not renewed—it is another form of mining. We all precipitate into a race to the bottom. I think we can say that we need to address that race to the bottom. You might say to me, "Well, you're from New Zealand and probably the most privileged in terms of nationality." And I want to say that there is some truth in that. Perhaps New Zealand is the only country that ever grew rich on the basis of primary production. But, we find ourselves in the same position. We find ourselves competing with the grasslands of Poland, or the orchards of Ukraine, or the sheep of Argentina, or the forest of Indonesia. Thus, the pressure is the same to produce commodities more cheaply. So we overgraze our soils, and our soils begin to run into the sea. I fly over New Zealand all the time and I have noticed that the big fans of the river mouths are getting bigger and bigger, and the grass cover is becoming thinner and thinner. We experience overgrazing and soil loss.

We also experience the consequences of climate instability. When I left, the pilot said that the visibility this morning is 50 kilometres. And so it was. There was not pollution. You can see all the way to the Arctic and the air was fresh, and pollution is something I never think about. But we have no ozone, and I look in the newspaper to see what the burn time is, and the burn time on the day I left was 12 minutes. We have no ozone, because the Arctic has no ozone, and that is because of the use of cars in Japan and in the U.S.A. I know that if we go on that way, you will not have ozone either. I think if China gets off from 2 wheels and on to 4 wheels, none of us will have any stability in our climate. But, who am I to say that China can not have cars? If I drive my 4-wheel drive with a 2.5 litre engine to the gym, get out of the car and go stand on a treadmill or the bicycle machine; we have got some imbalances that I think we need to owe personally.

I would like to talk about some of the ways I think that parliamentarians should feel that they can make a personal contribution to the credibility of the agenda for the survival of our planet. I think we can make a personal statement, because we have prominence in our society. I think that that can really add credibility to the urgency of the issue. Sometimes, it is difficult to do that individually but this organisation of parliamentarians is a multi-party one. Sometimes, if you do it together, you are more protected. I know that politicians focus on their little patch, but if we can build on some of the multi-party organisations, we can begin to speak for a wider agenda. For example, we can say that we are going to cycle to work or we are going to walk to work. We are not going to drive to the gym. We are going to get our exercise on our own feet instead of our 4 wheels. We can begin to make personal statements of that kind. I think that is of real significance, because we are leaders in our community. I think the multi-party group can often be really effective. I will just give you a little example of why perhaps it is useful. When I had to choose a ministerial car, I chose one that ran on LPG, because it is not

so polluting, and became a party issue about ministerial entitlements. So, I got the multiparty group to make a statement about our personal responsibility for climate change and stability. Now, half the government's fleet is buying LPG cars. So, if we protect each other and respect each other, we can sometimes make some gains.

When we went home from the last meeting, a multi-party group passed a motion in the House that was non-party, urging President Bush to restore the funding for family planning. I believe that we can help each other in these ways. We have the facilities to communicate, because we are parliamentarians. We have the networks, and we have the mechanisms that would allow us to begin to give credibility to the need to live our lives in different ways. I believe that one of the things we should do is, in a multi-party way, support the rectification of the Kyoto Protocol. I congratulate the Japanese Government for beginning to move ahead despite the setbacks to that agreement. But, there is one way I believe that every parliamentarian in this room can really assist in personal ways. I think that one of the messages was that there is an intimate connection with the issues of water use and empowerment of women, especially in our rural societies. I think every one of us has an opportunity to make a difference.

Yesterday, a Japanese professor said that women must organise to empower themselves. And indeed so they must. But, we will make much faster progress if we have the support of men of good will in doing so. My experience is that politicians who support the dignity and opportunity of women and children are, at least in societies where women vote, will not be disadvantaged in taking the stand. You can employ women in your offices. You can make sure that your own staff deals with women and children in a way which reinforces their dignity. But, most of all, I think you can all say that you will never allow cultural issues to become an excuse for cruelty or suffering of women and children.

The empowerment of women and children is critical. I think that when we look at population, what we need is for every woman to be given the opportunity to make a choice. If they have opportunity to make a choice, then they will make the best decisions for the welfare of their families. That is not something that can be sacrificed to cultural issues. So, I believe that the way to make that part of this agenda, to make some starts in that, is for women to organise for themselves, but call upon the good will of men in their communities. I do not believe that this is a political risk. Thirty years ago, when I entered public life, it was an issue in New Zealand. Now, the top five positions are taken by women, prime minister, leader of the opposition, the governor general, the attorney general and the chief of justice. We have 37 percent of women in the Parliament and more than half in the Cabinet; it is not an issue any longer. But we would not have got there, if it was not for the good will of men in public life as well as women. I think every one of us can actually make a difference in that way. I believe that taking that message of empowerment of choice is one of the things that we can share.

I would just like to say that one of the things we have done at the moment is that we have a new bill for local governments, and that bill has a provision on the privatisation of water. New Zealand has had a very bad experience in privatising its infrastructure. We have had to buy back a lot of that infrastructure because it has run down. A woman minister is passing a bill to prevent privatisation of water, and in the bill, there are very strict standards for water quality, for planning, and for the efficient use of energy within our own homes, and within our own personal environment, as well as with local and national government. That is one example of empowerment of women directly addressing the policy as well as the personal issues. Thank

you.

MS. OMAR

Thank you, Ms. Bunkle from New Zealand. One of the ideas that she is suggesting is the empowerment of women would help us in achieving our water-related goals. I believe New Zealand does not have as much a problem, but it is better for us to start addressing our water problems now. Water is essential to life and as we have heard from the speakers throughout these 2, 3 days, it is becoming a scarce commodity. Let's now move from New Zealand to China, one of the countries that has more than 1 billion population. Let's hear what the parliamentarians can do to create awareness and also to maximise the use of water in China. So Mr. Yu, you have the floor.

MR. YU EN'GUANG

Thank you Madam Chairperson. Ladies and Gentlemen. I am very pleased to come to Tokyo in the season of cherry blossom to attend the 18th Conference of Asian Parliamentarians on Population and Development. In the past two days, we have exchanged views on a very important issue; that is water resources. This is very constructive and very helpful to all of us.

China is a country with shortage of resources--water shortage in particular--considering its big population. We have a total volume of 28,010 billion cubic meters of unsalinised water resources. The volume of every person on average is just equivalent to one-fourth of that of the world as a whole. In rural China, the situation of water shortage is different and very much unbalanced. We have 80.4 percent of water resources located at the source of Yangtze River. While the population in this area just makes 53.9 percent and cultivated land is only 2 percent, cultivated land in northern part of China accounts for 14.7 percent.

Following the increase of population with the development of cities, one third of rivers in China have been polluted. Ninety percent of rivers around or in the cities have been seriously affected. One fourth of lakes are suffering from eutrophication; It means pollution is very serious.

China has attended with great importance to the protection of reasonable development for the protection of these resources as well as protection of water from pollution. For this, we have adopted various practical measures and achieved success. We have safeguarded the security of water for industrial use and for the use of ordinary people. We have built up the foundations for sustainable development of agriculture. All these played important roles in solving the people's eating problem in China. That is the biggest problem in China--eating.

I think China now has only 7 percent of cultivated land and has 22 percent of population of the world. On the subject we are now discussing, I would like to make 3 remarks.

First, National People's Congress of China--that is the parliament--is the highest authority organ and the highest legislative organ in China. National People's Congress stresses very much on legislation and preservation of water resources. In addition to education, science, culture and public health committees, we also have agricultural committee and resources and environment committees. These committees are all involved in reasonable exploitation and development of water resources and protection of water from pollution. As we all know, since 1979, when China launched policy of reform and openness, right from the beginning of this reform and

openness, the Standing Committee of National People's Congress put protection of water from pollution on its agenda. It has passed several laws concerning this issue. Since then, the Environmental Protection Law and the Land Protection Law, as well as the Law for Water Protection from Pollution were enacted. I can say that we established a basic legal system concerning management, exploitation and development.

Secondly, aside from the establishment of these laws, the Standing Committee of National People's Congress and its special committees--which we have 9 altogether--have often sent their members to the major rivers for protection from pollution. Through water projects in rural areas, the MPs asked the Central Government and local governments at various levels to increase the investment and enhance the efforts in various water areas. Through this work, problems at some major rivers and lakes, such as River [Wai?], which runs from north to south, on the east part of China have improved greatly. If you have an opportunity to visit China, you can see with your own eyes.

The third point; the deputies of National People's Congress, including myself, present every year a lot of draft bills and different suggestions on the resources issues. Some of these have been on the agenda for legislation. Some were passed to the central governmental department and to the local governments at different levels. They have adopted concrete steps to put those reasonable suggestions into practical operation. I believe that the Chinese Parliament will play more and more important role in the water resources area in the coming years of the future.

Parliamentarians are representatives of the people, as well as bridges between the government and the people. Their role in water resources management, planning as well as reasonable exploitation and development cannot be replaced by other people or other organ. National People's Congress would like to continue its efforts to strengthen the exchange and cooperation with the parliaments and parliamentarian of all other countries, like we are doing in this conference. We hope that such exchange and cooperation will consistently go forward widely and in a larger scale. I believe that we will achieve new success and benefit the people as a result. Thank you.

MS. OMAR

Thank you Mr. Yu En'guang. You have in fact covered your 15 minutes, with a bit of extra time. He has covered a wide area, but more important was towards the last part of his statement, which he believes, as a parliamentarian and as a representative of the people, of what he can personally do, because all of these policies that are made by whatever body must be translated into actions, and it begins with us. The very fact that we are all here is already a good beginning. Well, Ladies and Gentlemen. Thank you once again to Mr. Yu. Now, from China, we will move down to Indonesia. Dr. Surapaty. You have the floor.

DR. SURAPATY

Thank you Madam Chairperson. My Fellow Parliamentarians. Speaking about parliamentarians and water management, first of all, I would like to share with you the goal of the state-building. According to the Indonesian Constitution, there are at least three. One is improving the public welfare. Two, enlightening the lives of the people. Three, participating in protecting the world order and safety in collaboration with all other countries or states. Parliamentarians as elected representatives of the people in certain state should actively participate and lead the initial effort to reach these goals. Accordingly, the functions of the

parliaments are at least legislation, as you know, budgeting, and controlling the executive and implementing every development programmes. Indonesia's population is around 220 million, inhabited in at least 4,000 islands in which 5 are great islands. This population is represented by 500 members of the Parliament, coming from 10 parties.

According to UN report, human development index in 2000 was 102 among 160 countries. Water is necessary for human welfare. It can be said that apart from oxygen, no water no life. Water has continued to be a concern for the majority of humanity and has become a political issue in the world community in the course of the 1990s. This is according to yesterday's presentation by Professor Takahashi. Water is closely related to governance, peace building, finance, technology and trade. Therefore, water has to be managed carefully and innovatively in every place of sustainable development from the beginning of the planning of states.

Sustainable development is development where people's needs are met and their quality of life is improved at the present by safeguarding the ability of future generations to meet their own needs. Global environmental degradation, including global warming, that brings about freshwater scarcity, is an indication that the environment is not sustained. Therefore, there has to be a political will to raise the awareness of every political leaders that development paradigm must be shifted from extractive way to innovative one, from sectoral to regional environment, and from commodity to humanistic approach. In realising this, the role of parliamentarian is very crucial in order to overcome the challenges of our human kind. For the first and foremost, parliamentarians must be aware of the fact that access to water and sanitation is a necessary precursor to sustainable development.

Water management is one of the most important activities that have to be taken into account in every development programme to reach the goal of nations and countries. So I conclude that I would agree if our conclusion in this meeting adopts Mr. Steklov's proposal that the role of parliamentarians to create an enabling environment for action to start a sustainable water exploitation and to improve access to water supply and sanitation services at accelerated rates by pursuing policy reforms, as many policies need revision to reflect the current realities. In this the legislative function of the parliament body to enhancing institutions, streamlining institutional frameworks, establishing mechanism for coordination, promoting autonomy and accountability. The second is controlling the executive. In my observation, coordination is a very difficult one. There is a sectoral egoism. The third, promoting the capacity-building for planning management and development. This is the function, of course, of the parliament that we call budgeting. With this I conclude my speech. Thank you.

Discussion

MS. OMAR

Thank you Dr. Surapaty. It was very short, concise and to the point. Ladies and Gentlemen. That leaves us a lot of time now for discussion from the floor. I thank once again Dr. Surapaty for bringing our attention to this piece of paper that has been put on your table. I think also that this is a paper that we should adopt at this conference, and if it needs any addition, if you want to make any addition, or any subtraction, you are welcome to do so. Actually, we have an hour to do it. But since we come from all over Asia--some tropical country, some dry country, from Central Asia where there is less water, and tropical countries where there is a lot of water--I am sure whatever we adopt here, whatever programmes we want to bring to the grassroots, it will probably differ from one country to another. But, bearing that in mind, I think what has been written here applies to all of us. But, I must also add here a little bit, that the women who are participating here had a few minutes together while having their tea. And we did say we women parliamentarians have a role to play too, by mobilising women because they are the 50 percent of the consumers at the grassroots level. And we should have programs for them. I am sure Dr. Malinee has a few words on that. So does the princess from Cambodia.

So let me inform you that I would like to give a few minutes to most of the participants that come from countries that are not represented here. For instance Kyrgyzstan and Kazakhstan. From Central Asia we haven't heard. From Iran too we would like to hear. Would you agree if I give to floor now to... I thought I would save him for the last! In the western menu, dessert is always the last. Can I give the floor for a few minutes to the others? From Kyrgyzstan first and then from Kazakhstan in the Central Asia region and then to Iran.

INDIA

I want to say something about the declaration which we have put before the house. We have deletion or addition someone would like to make. I think it is an excellent document, but in this age of information revolution that we have, I think the role of media is not mentioned here, which is very important role in enhancing capacities and understanding of the people. But, I think the role of media should be added to this in propagating our objective. Thank you very much.

MS. OMAR

India would like to add it here. Enhancing institutions, streamlining institutional framework, establishing the mechanism for coordination.

MR. ASHENAGOHAR

I am Mr. Ashenagohar from the Islamic Republic of Iran. Actually, I am an interpreter from the Embassy of Islamic Republic of Iran. Mr. Gharibani gives his thanks to all distinguished participants, chairpersons and other persons who are attending this program. Mr. Gharibani has mentioned that the meeting was very fruitful for him, and as a member of parliament, I have decided to hold a program and meeting in my country in the near future. We need your plans to make the program more fruitful and to work practically--simply delivering the speech is not sufficient. Also, we are parliamentarian members, so for the budget for taking the decision and

policy of the budget, we may do everything. But as you are not scientists, we need to gather and make new decisions and new policies. I need your help in starting a new meeting that I am planning to hold in Iran. I would really appreciate it if those representatives from Asian countries attend the program and cooperate with me in this respect. Iran is very beautiful and has so much capacity to do everything in respect of population, family planning, health and water management. Thank you very much.

MS. OMAR
Thank you to the delegate from Iran. If I understand you correctly, you are inviting us all to come and help you in Iran, especially with technical matters. We should ask our Japanese host to perhaps gather again all the experts and bring them to Iran.

MR. ASHENAGOHAR
Definitely.

MS. OMAR
Where is Mr. Gharibani? Is he around? We can convey that to him. I am sure you can convey that to him. Thank you. We will all be happy to go to Iran. Are there any other countries that would like to say a few words? Kazakhstan? Dr. Malinee, you have the floor.

DR. MALINEE
Thank you Madam Chair. Actually, in my point of view, I think that, first of all we have to understand that one of the methods for solving the problems of natural resources and the environment is the concept of community base and effective management system. So what I do in my country, I selected 11 provinces and got the tambon leaders--a tambon consisting of 8 to 12 villages--of these 11 provinces with the tambon leaders. So I educate them about HIV infection. But actually, we have message that we would like to send to them regarding these matters to improve the quality of life in tambons and in villages. It means that we go to the grassroots and then I move on to the second step, which is media, and let most of the people in the country understand about the real problem with water resources and sanitation. From that, we alert the people through such education and perform our duty in legislation and budgeting system later on. Otherwise, they will shock the people by saying that, "OK., we will have to charge tax on the water." Get the education first—that is my point.

One thing I noticed was that, when we need participation, we go to the women first because if we have a villager that needs a loan for 1 million baht, I ask the government to have women to arrange that money. We can get back about 90 percent of the time. If we do not use women for this job, we will lose nearly all of them. So, women may play a big role in this kind of matter. Thank you.

MS. OMAR
Thank you Dr. Malinee from Thailand. Are any other questions? Bangladesh.

MR. HOSSAIN
Thank you, Madam Chairperson. I would like to make a short comment. This is the first experience for me. These activities and situation are not so known in our country, but I have found it to be very fruitful for the last 3 days--the discussion has been of much benefit to us and very useful to a country like Bangladesh. And the activities of the organisations should be

made more popular amongst the parliamentarians of the Asian countries. The organisers, particularly Japan, which is the headquarter of this organisation and which is demonstrating leadership in this respect, should take effective measures for making the parliamentarians more informed and interested in the activities because it is the parliamentarians who ultimately devise national policies on population and development. So we are pleased that the organisation takes note of my views for making it more among the parliamentarians of the Asian countries. Thank you.

MS. OMAR
Thank you. I believe that the Asian Forum for Parliamentarians will be reactivated in Bangladesh. So, what you have requested is already on the pipeline. I am sure we will be coming to Bangladesh. It will be reactivated. Thank you. Iran?

MR. ASHENAGOHAR
Yes. I have a question. Can you explain a little bit, New Zealand and advise me in this respect? Actually, we know that in those countries that have distinguished religions and customs, consumption of water in those regions sometimes depend upon religions. For example, in India, when they want to go for a shower they use 5 to 10 litres of water. In other countries, according to their religion, they may use more or less. The question is that, to make a standard for use of water for people with different religions and customs, what we should do advise the people. Is there any standard or suggestion for advising the people about the usage of water or other things? Is there any outline or guidance in this respect?

MS. OMAR
If I am not mistaken, you are asking if there is any standard formula for the use of water per person?

MR. ASHENAGOHAR
That is right.

MS. OMAR
I am sure the UN office can say something. Would you like to come forward?

MR. STEKLOV
In fact, there is no standard for water use but it depends on specific situation of each country and each city. For example, in Singapore, per capita daily consumption is about 160 litres per day. In some other countries, it might be more. Yesterday, somebody mentioned it is about 300 litres per day in Japan. But, we are trying to encourage reduction in per person use of water, to conserve water. It is a message from United Nations now to reduce use to conserve water. Thank you.

MS. BUNKLE
Can I just make a comment? One of the suggestions that the gentleman made in the last session was for the water tariff to be higher the more you use. That has been discussed in New Zealand and it has been adopted. I will just tell you the discussion, because I think it is valuable. It was a part of privatisation discussion. Our thoughts were, with privatisation, there is a pressure to encourage more use in order to increase the profitability. A part of the resistance to privatisation was saying that it was opposed to conservation. The suggestion was

that we might accept privatisation if they had the inverse tariff; whereby the cost was low for the basic amount for each household and if the household used a great deal of water, they would pay proportionately more as it went above the basic to prevent the profiteering from lack of conservation. Adoption of such proportional tariff was seriously discussed, because it turned out that 10 percent of households used hugely more than the average, and those households were washing their boat, spraying their garden--I do not know what they did--they must have had hundreds of showers a day or run a swimming pool. The idea was that, if you had privatisation, you encourage more use, then you had to provide the infrastructure, and then water became expensive for the ordinary person, for whom it was an essential health benefit. In the end, this debate ended up with a bill which is currently before Parliament, to say that we do not want privatisation at all, because we want to promote conservation and efficient use, rather than saying that this is a profitable commodity. So that is how our debate has gone. But, my own belief is that we had somebody yesterday, talking about the need for more private sector involvement. I would like to say that everyone has a human right to a basic level of clean water; and the tariff goes up more, the more you use. I think that is an essential add-on, if we are going to have a massive private sector involvement in developing water supplies.

MS. OMAR

Thank you New Zealand. You see, Honourable Participant from Iran, it seems that there is no standard formula for the amount of water that anyone uses. It ranges from 160 litres per day per person of Singapore. But speaking to my neighbour from China, a big country with lots of people over 1 billion, he said that the Government has asked the people to conserve and save water. I did not know about India--22 to 40 litres per day. And you go down to New Zealand, there is limit. The more water you use, the more profitable it is for privatised company because it is a privatised project. So New Zealand has already opposed privatisation. So, there you are Ladies and Gentlemen. I think the best policy is to use little and conserve water. Yes, from Cambodia. You have the floor.

PRINCESS SANTA

Thank you Madam Chairman. I would like to make a comment from a developing country's point of view, because like Cambodia, many developing countries relied on the international donors for their development. So, now we have a performance-based allocation. In performance-based allocation, we do not get the money right now to do anything. You have to perform first in order to get your loan or donation. I think in that part it is very difficult for us to make a realistic plan. We do have plans in Cambodia, and I am sure most of the developing countries they have plans also. But, as the water supply and sanitation are in crisis, we have to do something about it. Otherwise, many people will die from pollution or diseases coming from the water situation.

I feel that for most developing countries, NGOs are very much involved in the development part. But they are involved mostly in education and they have more money for training and education. I feel that maybe there are NGOs, because of the easiness in getting grants, they should be more active in implementation, more action taken for this water management and supply. This should be the way in developing countries. We cannot wait, you know, for the bureaucracy or ministerial problems and red tapes and all that. I will only talk about the Cambodian situation. We have the Ministry of Water, we have another ministry, Ministry of Rural Development, and we have another ministry that manages another kind of water, so all of them do not agree on something.

Even building a dam is still a problem, because you have to request that to the Ministry of Construction, then the water agreement... To make it short; this is a problem for bureaucracy to take part in that. I think NGOs are more convenient for the most developing countries to make the implementation a reality. Thank you.

Ms. Omar

Thank you for your contribution, Cambodia and for sharing with us some of your problems. I feel that maybe this is a role for the parliamentarians. Like in Cambodia, you can be the person to mobilise the NGOs, to make them aware, give them the information and lead them towards better management of water. Maybe there are countries that can follow the lead of what Cambodia has suggested. Ladies and Gentlemen. I feel I have given enough time for people to participate. Now we get to our dessert, the last speaker in this panel. Now, without much ado, I would like to invite the representative from the Philippines, Mr. Emilio Macias. You have the floor.

Mr. Macias

I was promised an hour. I would like to thank the organisation for extending to me and my colleague, the representative from the province of Albay in the Philippines, the Honourable Luistro. She is a nurse, and obviously, you know, she is a beautiful lady and will be giving birth to another child. In the Philippines, we have 3 births per minute, and she will add to the population of my country.

I am very fortunate to be able to come to this forum, because I saw that we give force to the problems that affect a lot of countries, the details of diagnosis, the treatment, the rehabilitation of the particular problem. I was scared when I came here, because I felt uncomfortable because the car I was riding was driving on the wrong side of the road, since in the Philippines, we drive on the right side. In Tokyo, it is on the other side. This is the only conference in which the Philippines is right in front—we are always found at the back.

For my friends, especially those are in Central Asia, may not know where the Philippines is. It is only 4 hours by jet, south of Tokyo. We are 1 hour behind in time. The Philippines is an archipelago. It is made up of 7,100 islands and has 700 dialects. So we need to speak English in order to communicate among our people. We have a national language, Tagalog, but that's foreign language to some of us who are in the Visayas. So we speak English in the way we are taught.

It might be interesting to know that there are 77 million Filipinos today. I was looking at our little calculator. It seems that we are going to have 3 births per minute in my country. So if I take 1 hour, that will be 60 minutes times 3, then you will know how many children were born while I wasted time talking to you like this here this afternoon.

Giving rights to women in the Philippines is not really a problem. I come from a family where my father was very strict and he said that women should have better rights than men because they are disadvantaged by being females. I do not know, but I think that the reason was not the same when he was advocating women's rights.

We are a predominantly a Catholic country--that is a problem. You mentioned about religion

and water. Our problem is religion and population. Since population is related to water problems and sanitation, and to quality of life of the people of the country, that is one problem. The Roman Catholic Church thinks that you cannot even use artificial ways for preventing male sperm and female egg to join together, because that would be a sin. It is left to the individual members to think that if they do this that would be a sin. I am a surgeon and I consider myself a good surgeon. My wife was my classmate and she is also a good obstetrician. She is in obstetrics, but since she is a Roman Catholic, we have 6 children, because we followed the rhythm method of Roman Catholic Church. Often times, we mates do not bother about the rhythms. It does not come at the right time that we need it. So, you see, even those educated women in our country fall prey to all of these disadvantages because of religion.

One time, I was asked whether I should consider becoming the Minister of Health in my country. The only question he asked me was "What do you think of family planning?" Of course, I said, "It should be smorgasbord thing. You put every method on the table and it should be up to every individual to choose what he wants to get." But in my country, members of the cabinet are easily removed so I thought that being a parliamentarian was far better. So I said, "Njet". I remembered that Russian word. For those who do not understand Russian, that means "no."

Our sources of water are almost the same as most of the counties in Asia. We have good rainfall and have two seasons--the dry season and the wet season. Often we get typhoons. We get something like 30 to 40 typhoons a year, and this is where we get our water. We also have rivers. We have river basins that range from 40 square kilometres to 25,000 square kilometres in area. Our groundwater is about 50 square kilometres, and it is estimated that the volume would be 251,158 million cubic metres. Our problem therefore is not volume. It is distribution and quality of the water. Earlier today, one of our speakers showed a picture of the Philippines where you saw a lot of containers. I think the Japanese thought that that should be corrected. But these containers are from Japan, and since we are not buying them because in most of our rural areas we have the water pipe system. We have done away with those containers. But another thing that we have done away with was that often times that place was the meeting place of young men and young women when they were waiting for the water to pump and they also talked love to one another. So that way we reduced population.

The form of government. We have a presidential form of government with three branches. There is the Executive which is headed by the President. In my country, that is a powerful position, although if you look at our history, very recently, we removed two presidents by people's power. There is no assurance that leader's power, the most powerful person in my country, would rest in the hands of the president. There is no guarantee that he cannot be removed.

Number two is the legislative. But, the legislative is comprised of two houses. So that if a bill is filed in the House of Representatives, it must have the counterpart measure in the Senate. Often times, they are not of the same wording or the same volume. Then, there is another body, the Conference Committee. So, there would be three effective bodies that decide when a law is made before the President signs it.

So you can imagine the difficulty of passing a particular bill in the House of Representatives. But measures like this--measure that improve the environment, measures about women's health, women's rights--these are easily supported by the politicians. There are about 37 Women in

the House of Representatives out of position of 214 seats. Another 14 seats for the party-less.

Now there are 3 pending bills right now, but let me go back to 1976. When we talk of laws, laws are only good if they are implemented properly. In 1976, we already had a water code in the Philippines, because we noticed the lack of industrial needs. It was being pumped out from the earth, reducing our groundwater. In that particular code, we had already put the standards--what to put up, and how much to remove. Because in most of our coastal cities--the big ones like Sebu, Manila--the sea has come in into the land and you got salinated water.

In 1976, the law did nothing for the local government--maybe this is one of the reasons--local government and the community. Right now, there is a bill that is being considered in the House of Representatives which provides for comprehensive water quality management for other purposes. The problem with this very long bill is that it might be good but some of us parliamentarians may find something in one of the pages and it would take some time to proceed. But, I do not see any serious objection to passing this particular bill. We also have pending another bill, the Reproductive Health Act that creates an environment where choices can be made and rights can be exercised by women. The last one is on population and human development with focuses on the quality of life of the population, not only merely bringing down the numbers but also making that lowered number population enjoy life--giving more life to the years that these people enjoy. Then, we also have interrelationship between population and the environment. In other words, you cannot just push the population without thinking how it affects the environment; how it affects the education; how it affects health.

So this is the situation we find ourselves in the Philippines. As a parliamentarian, I see that we have a great influence. Maybe not in the upper structure of the government but especially below, as mentioned by a doctor from Thailand to go to the masses. Yes. This is where we are effective. That is why we are elected as representatives of our districts. It needs our advocacy. It means that we need to support strongly and make decisions. These people admire us. Maybe they do not tell us, but if they know that we are for that, this must be something good. So, I suggest that we do this. We can make, we can file this. We can have several laws. In the Philippines, we have several laws that are dead. They are not being implemented, or no one wants to implement it. We need these because I see that we cannot wait. It is something that is starting us into our faces. Water and population. Maybe we can suggest. I do not know who will tell the Pope. But maybe the Pope should be told too, to see to it that there is a problem. He is an intelligent person. Because if you talk to him and you convince him, then you will convince a lot of Catholics in the world.

Allow me to thank every one of you. I only regret that I did not have the time to converse with you, and I hope that after Iran, you should hold this in the Philippines so that we can return the favour, especially to the Japanese who have been a very wonderful host.

MS. OMAR

Thank you for the beans. Didn't I tell you that is our dessert for the evening? Thank you very much for your presentation. Ladies and Gentlemen. We have come to the end, but before I do that, once again I would like to thank all the panellists who are here and also to all distinguished delegates for participating in this afternoon's session.

As parliamentarians, the question that has been put to us is "What are our roles as

parliamentarians?" And in the discussion, we have said what would like to say and I would like to take the suggestion and I hope that Mr. Shiv Khare is around hearing this. The next place is Iran. They would like to have a similar discussion in Iran. Then Bangladesh would like to host it. The Philippines too would like to host it. And India as well. It looks like in each of the 23 countries that are members of AFPPD, we will continue to have similar forum in these countries so that we are able to create this awareness with our parliamentarians who we hope will go down to the grassroots to start the movement for us to look after our water sources and to manage our water properly.

So Ladies and Gentlemen. I just asked my neighbour here from China, and he said in China there are 2,987 parliamentarians. If we add up all the members of parliament in the 23 countries, I'm sure we're a force to be reckoned with. I am sure our voices are heard as Mr. Macias said, we are loved by the people. Otherwise we will not be elected. I am sure what we have to say will be understood and we will be able to translate all of these policies that are talked at the high level down to the grassroots level and make our plans of action. I think, we have done our job for this afternoon, and for me, personally, I would like to thank all the panellists who have made my job as moderator very easy. Thank you to all of you too, who have made it very easy for me this afternoon. I would like to say a special thank you to our hosts from Japan for having us all here and I personally would like to say thank you. Ladies and Gentlemen. We have come to the end of our session and once again thank you very much. *Arigatou gozaimasu.*

Closing Ceremony

Address

Dr. Taro Nakayama, MP
Chairman, APDA

Address

Mr. Zhang Huaixi, MP (China)
Vice Chairperson, AFPPD

Address

Dr. Taro Nakayama, MP
Chairman
Asian Population and Development Association

MR. HIROSE
Distinguished Delegates. Ladies and Gentlemen. I would like to thank you very much for your fruitful and stimulating discussion over the past 2 days. Now, I would like to declare the start of the Closing Ceremony. To begin, I ask you to please welcome Dr. Taro Nakayama, Chairman of APDA.

DR. NAKAYAMA
Mr. Yoshio Yatsu, the Chairperson of AFPPD. Dear Parliamentarians from different parts of the world. Distinguished lecturers. Thanks to your dedication and participation. We are about to close the 18th Asian Parliamentarians Meeting of Population and Development in great success. I would like to express a sincere appreciation.

Water is so close to our heart in day to day life. In many countries of Asia, even today the stable supply of water is an unsolved issue. And fetching water and other related works are on the shoulders of women and children. Though some improvements have been made, today the waterborne diseases are still the major causes of death that brings so much sorrow to many mothers. We have decided to focus on the question of water which is truly a relevant issue for many developing nations of Asia.

We hope that this conference has proved to be informative and that your discussion will be better effected in your future activities and policies.

APDA has come this far. The past 20 years of history has been two decades of turmoil and dramatic changes in terms of population and politics. Two decades are just one passing point. Population and development issues are becoming even more serious from a global perspective. We have no time to lose to find better solutions for the environmental protection and sustainable development. Had we not done anything for the last 20 years, what would have happened if we remained idle during the past 20 years? What would have been the population of the world today? I am sure the world before us would have been much gloomier than what is today. The population issue is becoming even more pressing. But, I also would like to acknowledge our efforts and endeavours have generated tangible results and advancements.

APDA, whilst a small organisation, will continue to work to contribute to the population problems in the world. We take pride in making such a modest contribution.

After closing this, I would like to continue to be active in this area. APDA conferences would be organised in the future. We will listen very carefully to your views and suggestions so that we can always identify the timely subjects and so that we can make contributions on our part in your endeavours to find solutions for population and development.

I take this opportunity to seek your continued support and guidance. Beautiful cherry blossoms welcome you, and we are very pleased that we were able to prepare such an environment. We would like to thank you for your very active participation during the past 3 days and would like to close by thanking you very much.

In October of this year, General Assembly of AFPPD will be organised in Beijing and I look forward to seeing every one of you there. Thank you very much.

Address

Mr. Zhang Huaixi, MP (China)
Vice Chairperson
Asian Forum of Parliamentarians on Population and Development

MR. HIROSE
Thank you very much Dr. Nakayama. Now, we would like to hear from Dr. Zhang Huaixi, Member of Parliament from China, and Vice Chairman of AFPPD, to deliver his address.

DR. HUAIXI
Distinguished Parliamentarians. Ladies and Gentlemen. Thanks to the thoughtful arrangements of our Japanese host, with the passionate participation of you distinguished parliamentarians, the 18th Asian Parliamentarians Meeting on Population and Development has borne fruits and is to be concluded soon. Before the two-day meeting, we participated in the celebration and workshop of the 20th anniversary of the founding of APDA. Over the past 20 years, APDA has been supporting the forum, promoting the communication and collaboration among parliamentarians. They have done a lot of job, and they certainly deserve our adequate favour and heartfelt gratitude. We hope that APDA will continue to play a positive role in future.

Fellow parliamentarians, the theme of the meeting year is about water and sanitation. These issues are of immediate significance for the Asian countries. I would like to thank the wonderful speeches by the experts. They have provided for us a wealth of knowledge, statistics, information and proposals, which is very meaningful for us in our own countries. You parliamentarians have put forward a variety of valuable ideas. By putting forward ideas, we enhance communication. Also, we have opportunities to learn from each other. Our mutual understanding has been boosted, and friendship among us has been cultivated. We also met much consensus on the issues concerning water. The meeting has created favourable conditions for further exchange and cooperation.

I would like to point out, in particular, the APDA meeting is being held in the season of cherry blossom. The famous flower in Japan. The beautiful cherry flowers are really an eye feast to all of us. This year, the cherry blossom comes a little bit earlier, which has added lustre and atmosphere to the meeting this year. I would like to thank our Japanese friends for choosing such beautiful days.

Representatives from UNFPA and IPPF have been giving due attention to the forum. Their speeches, guidance and support are of critical important for Asian countries to launch their activities concerning population and development.

Fellow parliamentarians, AFPPD is now 20 years old. The Executive Committee has decided that the 7th General Assembly will be held in Beijing this October. At lunch time, Mr. Chairman has announced the decision to all of you and extended cordial invitation to all of you. The forthcoming General Assembly will be the first of its kind in the new century. Therefore, it certainly carries weight. China's National People's Congress is deeply honoured to have the

opportunity to shoulder this task and attaches great importance to the 7th General Assembly of AFPPD. In the 5th Session of the 9th National People's Congress, which was concluded just days ago, Chairman of the Standing Committee of NPC, His Excellency Mr. Li Peng, referred to the 7th General Assembly of AFPPD as a very important event for China's NPC this year in his report. The General Assembly has been put on the agenda. He directed to us that we must make the General Assembly a success. And yesterday evening, the Executive Committee of the forum held a discussion and decided that the 7th General Assembly of AFPPD is to be held in Beijing in mid-October. We suggested that the specific timing shall be between October 15 and 18 because October 16 is the World Food Day and October 17 is the International Day for Eradication of Poverty.

Food and poverty. These issues are compatible with the principle of AFPPD. If we choose these two days to hold the meetings, it will make the 7th General Assembly more significant and meaningful. The Executive Committee also agreed that the theme of the 7th General Assembly will be "Asian Population and Development in the 21st Century." This is the general theme. According to the proposal of the Executive Committee, Mr. Chairman of the Forum will report on the history of the Forum over the past 20 years. And Mr. Chairman is expected to look forward to the future of the Forum. Meanwhile, we should research some amendments to the Constitution of the Forum.

We also discussed issues like the activities we launched before, the budget and the future plans, etc. Under this general theme, we discussed and decided to select several sub-themes, for example, urbanisation, because the process of urbanisation in Asian countries has brought about great impact on the change of populations, structure and distribution. So it deserves our discussion. Another sub-theme might be poverty alleviation. This is an important issue that the developing countries in Asia are concerned about. Another sub-theme is aging society. This is also a significant social problem facing, or to be facing, the Asian countries.

Aging society is also a prominent and outstanding issue related to population. These issues are important issues we are facing now, and parliamentarians from every country are concerned about them. As for the specific timing and content, you will be informed later. According to the requirements of the Executive Committee of AFPPD, China's National People's Congress will make earnest effort in preparing for the General Assembly. We will strengthen coordination and cooperation with AFPPD Secretariat, with the view to getting well-prepared for the General Assembly.

We will follow the advice of Mr. Chairman and members of the Executive Committee and also with the advice of you parliamentarians, we hope to make the General Assembly a huge success.

The weather is fine in Beijing in October. It is very pleasant. Autumn is a beautiful season in Beijing. Filled with passion and zest, we would like to open our arms wide to welcome you distinguished parliamentarians to Beijing. With concerted efforts, we are sure to make the assembly successful and memorable.

In conclusion, I would like you to join me in extending our heartfelt gratitude to the staff members--those who have been working hard for the success of the 18th Asian Parliamentarians Meeting. Let us meet again in Beijing. And I wish all of you, Ladies and Gentlemen, a safe

and pleasant voyage back home. Bon Voyage.

MR. HIROSE

Thank you very much. Honourable Dr. Zhang Huaixi. We look forward to seeing you again in China in October. This will bring us to the closing of the 18th Asian Parliamentarians Meeting on Population and Development, which we have had the privilege to organise. APDA takes this opportunity to express our deep sense of gratitude to honourable parliamentarian and other delegates around Asia who are here today. As always, it has been our great pleasure to have your support. And we look forward to seeing you all again in Beijing. Our Chinese friends have promised a wonderful golden season in Beijing. Till we meet again. Bon voyage. Safe journey home. Sayonara.

List of Participants

Australia	Ms. Kelly HOARE, MP	Federal Member for Charlton, Parliament of Australia
	Mrs. Margaret MAY, MP	Member for McPherson Australian Parliament
	Ms. Dianne PROCTOR	Executive Director, Australian Reproductive Health Alliance
Bangladesh	Mr. Khondker Delwar HOSSAIN	Chief Whip, Bangladesh Parliament
Cambodia	Princess Sisowath SANTA, MP	Member, Commission on Public Health, Social Work and Women Affairs
	Mr. Hap OMALY	Administrative, Cambodian Association of Parliamentarians on Population and Development (CAPPD)
China	Mr. Zhang HUAIXI, MP	Vice Chairman, Education, Science, Culture and Public Health (ESPCPH) Committee of NPC
	Mr. Yu EN'GUANG, MP	Member, Foreign Affairs Committee, NPC
	Mr. Li HONGGUI, MP	Member, Education, Science, Culture and Public Health (ESPCPH) Committee of NPC
	Mr. Zhong RONGLAI	Director, Foreign Affairs Bureau, General Office Standing Committee, NPC
	Mr. Liu SHENGLI	Director, Bureau of Secretaries, General Office Standing Committee, NPC
	Mr. Yang SHENGWAN	Director, Education, Science, Culture and Public Health (ESPCPH) Committee of NPC
	Mr. Jiang HENGWEI	Official, Foreign Affairs Bureau, General Office Standing Committee, NPC
	Mr. Cao XIONGWEI	Official, Foreign Affairs Bureau, General Office Standing Committee, NPC

India	Dr. V. SAROJA, MP	Indian Association of Parliamentarians on Population and Development (IAPPD)
	Mr. R.L.BHATIA, MP	Former Foreign Affair Minister
	Mr. Manmohan SHARMA	Executive Director, Indian Association of Parliamentarians on Population and Development (IAPPD)
Indonesia	Dr. Surya Chandra SURAPATY, MPH	Chairman, Indonesian Forum of Parliamentarians on Population and Development
Iran	Mr. Ali Mohammad GHARIBANI	Member of Parliament, Islamic Consultative Assembly
Japan	Dr. Taro NAKAYAMA, MP	APDA Chairman Member of House of Representatives
	Mr. Yoshio YATSU, MP	AFPPD Chairman Member of House of Representatives
	Mr. Takashi MITSUBAYASHI, MP	Member of House of Representatives
	Mr. Yoshihide SAKAUE, MP	Member of House of Representatives
	Mr. Shin SAKURAI, MP	JPFP Vice Chairperson Member of House of Councillors
	Ms. Kayoko SHIMIZU, MP	JPFP Secretary General Member of House of Councillors
	Mr. Katsutsugu SEKIYA, MP	JPFP Vice Chairperson Member of House of Councillors
Kazakhstan	Mr. Beksultan TUTKUSHEV, Senator	Chairman, Group of Parliament of Kazakhstan on Family and Population
Kyrgyzstan	Mr. Alymbay SULTANOV, MP	Member of Parliament, Legislative Assembly, Parliament of Kyrgyzstan
	Mr. Alisher ABDIMOMUNOV, MP	Member of Parliament, Legislative Assembly, Parliament of Kyrgyzstan
Malaysia	Hon. Datuk Zainal Abidin ZIN	President, AFPPD Malaysia
	Dato' Napsiah Binti OMAR, MP	Deputy Secretary General, AFPPD Malaysia
	Datin Paduka Hjh. Rahmah OSMAN	Executive Director, AFPPD Malaysia

Mongolia	Mr. Navaansamdan GANBYAMBA, MP	Member of Parliament, Parliament of Mongolia
New Zealand	Ms. Phillida BUNKLE, MP	Member of Parliament, New Zealand Parliamentarians' Group on Population and Development
Philippines	Rep. Cielo Krisel LAGMAN-LUISTRO	Board Treasurer, Philippine Legislators' Committee on Population and Development, Inc.(PLCPD)
	Rep. Emilio MACIAS II	Member, Philippine Legislators' Committee on Population and Development, Inc.(PLCPD)
Republic of Korea	Mr. Hae-Chan LEE, MP	President, Korean Parliamentary League on Children, Population and Environment (CPE)
	Mr. Young-Keun AHN, MP	Executive Secretary, Korean Parliamentary League on Children, Population and Environment (CPE)
	Ms. Sang Mi LEE	General Director, Korean Parliamentary League on Children, Population and Environment (CPE)
Thailand	Dr. Malinee SUKAVEJWORAKIT, MP	Senator, The Thai Senate
	Ms. Pompich PATANAKULLERT, MP	Member of Parliament, Parliament of Thailand
Vietnam	Mme. Nguyen Thi THAN, MP	Chairperson, Vietnam Association Parliamentarians on Population and Development (VAPPD)
	Mme. Nguyen Thi XUAN MY, MP	Vietnam Association Parliamentarians on Population and Development (VAPPD)
	Dr. Truong Minh THANG, MP	Vice Chairperson, Vietnam Association Parliamentarians on Population and Development (VAPPD)
	Dr. Nguyen Van TIEN	Executive Director, Vietnam Association Parliamentarians on Population and Development (VAPPD)

International Organizations

AFPPD	Mr. Shiv KHARE	Executive Director, Asian Forum of Parliamentarians on Population and Development (AFPPD)
AFPPD	Ms. Romchalee NGAMWITROJ	Administrative Associate, Asian Forum of Parliamentarians on Population and Development (AFPPD)
UNFPA	Mr. Kunio WAKI	Deputy Executive Director, United Nations Population Fund (UNFPA)
IPPF	Mrs. Ingar BRUEGGEMANN	Director General, International Planned Parenthood Federation
FAO	Mr. Teiji TAKAHASHI	Director, FAO Liaison Office in Japan
FAO	Mr. Tetsuji NAKATA	Project Manager, FAO Liaison Office in Japan

Resource Persons

ICU	Dr. Kazuo TAKAHASHI	Professor, International Christian University
Hokkaido Univ.	Dr. Eimatsu TAKAKUWA	Professor, Emeritus Hokkaido University
Kinki Univ.	Prof. Nobumasa HATCHO	Professor, Kinki University, Department of International Resources Management, School of Agriculture
JICA	Ms. Keiko YAMAMOTO	Senior Adviser, Institute for International Cooperation Japan International Cooperation Agency
Hokkaido Univ.	Prof. Yasumoto MAGARA	Professor, Hokkaido University, Graduate School of Engineering
ESCAP	Mr. Yuri STEKLOV	Economic Affairs Officer, Environment and Natural Resource Division, ESCAP

Observers

Thailand	Prof. Dr. Prasop RATANAKORN	Chairman, Advisory Board, Senate Committee on Public Health

Embassy	Dr. Z. BATJARGAL	Ambassador Extraordinary and Plenipotentiary of Mongolia to Japan
Embassy	Mr. A. ASHENAGOHAR	Cultural section, Embassy of the Islamic Republic of Iran
Embassy	Mr. Anuarbek AKHMETOV	Third Secretary, Embassy of the Republic of Kazakhstan in Japan
MAFF	Mr. Ken SHIMOKAWA	Official, International Cooperation Div, Ministry of Agriculture Forestry and Fisheries

Asian Population and Development Association (Organizer)

APDA	Mr. Tsuguo HIROSE	Executive Director, Secretary General Asian Population and Development Association
APDA	Mr. Osamu KUSUMOTO	Assistant Secretary General, Asian Population and Development Association
APDA	Mr. Masaaki ENDO	Project Manager, Asian Population and Development Association
APDA	Ms. Yuko KATO	Manager of International Affairs, Asian Population and Development Association
APDA	Ms. Junko MOCHIZUKI	Asian Population and Development Association
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