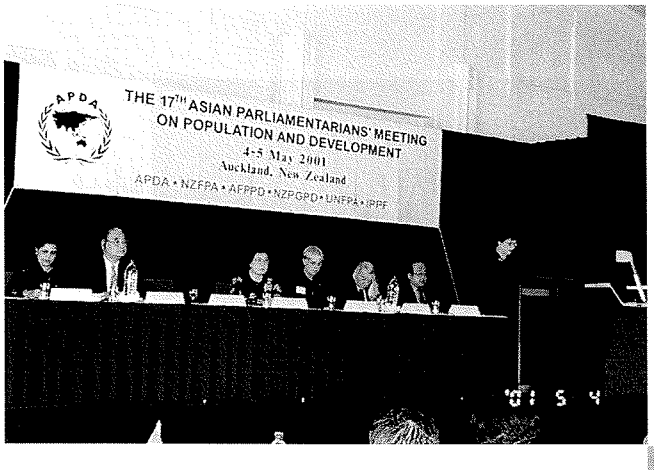
THE SEVENTEENTH ASIAN PARLIAMENTARIANS' MEETING

ON POPULATION AND DEVELOPMENT

Auckland, New Zealand
May 4-5 2001

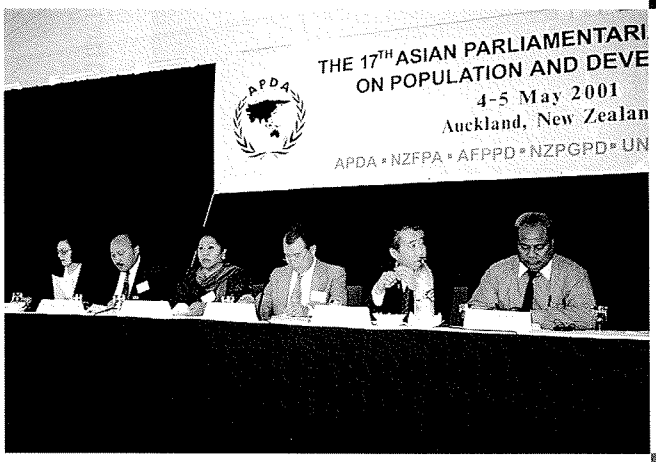
THE ASIAN POPULATION AND DEVELOPMENT ASSOCIATION
(APDA)

Participants of "The 17th Asian Parliamentarians' Meeting on Population and Development"



Opening Ceremony: (from right) Hon. Ms. Judith Tizard, NZ Minister of State, Mr. Kunio Waki, UNFPA Deputy Executive Director, Mr. Colin Hollis, AFPPD Secretary General, Ms. Steve Chadwick , NZPGPD Chairperson, Ms. Kayoko Shimizu, APDA Vice Chairperson, Mr. Yoshio Yatsu, AFPPD Chairperson, Dr. Raj Karim, IPPF East & South-East Asia and Oceania Regional Director

Keynote Speaker:
Ms. Luamanuvao Winnie Laban, MP



Panel Discussion: (from right) Mr. Falemoe Leiataua Tolfuaivalelei, MP (Samoa), Mr. Muneaki Samejima, MP (Japan), Prof. Vo Tong Xuan, President of Angiang University (Vietnam), Dato' Napsiah Binti Omar, MP (Malaysia), Mr. Alymbay Sultanov, MP (Kyrgyzstan), Russian Interpreter

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PROGRAMME

The 17th Asian Parliamentarians' Meeting on Population and Development

Theme: Food Security, Water Resource and Population Issues in Asia and the Pacific
—Sustainable Development for the Future of humankind—

Friday, May 4, 2001 (1st Day)

Opening Ceremony

9:30 – 10:30	Welcome Address:	Hon. Ms. Judith Tizard, Minister of State of NZ read address of Hon. Ms. Annette King, Minister of Health /Racing (NZ)
	Welcome Address:	Ms. Steve Chadwick, MP, Chairperson, NZ Parliamentarians' Group on Population and Development (NZ)
	Opening Address:	Ms. Kayoko Shimizu, MP, Vice Chairperson, APDA read address of Dr. Taro Nakayama, MP, Chairperson, APDA (Japan)
	Address :	Mr. Yoshio Yatsu, MP, Chairperson, AFPPD (Japan)
	Address :	Mr. Colin Hollis, MP, Secretary General, AFPPD (Australia)
	Address :	Mr. Kunio Waki, Deputy Executive Director, UNFPA
10:30 – 11:00	Tea Break / Group Photo	
11:00 – 11:45	**Keynote Address: "Population and Development in the Island Nations of the Pacific"**	
	Speaker :	Hon. Ms. Luamanuvao Winnie Laban, MP
12:00 – 14:00	Lunch (hosted by Asian Population and Development Association: APDA)	

Session I: "Carrying Capacity in Asia and the Pacific"
—Focus on Food and Water Resource—

14:00 – 15:30 Chairperson: Mr. Zhang Huaixi, MP, Vice Chairperson, AFPPD (China)

① Carrying Capacity of Asia as Influenced by Environmental Resources
Speaker: Dr. Zembei Uchijima, President of Miyazaki Municipal University (Japan)

② Case Study of Sri Lanka.
Speaker: Mr. A.T. P. L. Abeykoon, Director of Population Division, Ministry of Health (Sri Lanka)

③ Population Carrying Capacity in the Pacific
Speaker: Dr. Chris McMurray, Demographer, Secretariat of the Pacific Community (New Caledonia)

15:30 – 15:45 Tea Break

15:45 – 17:00 Discussion

18:00 – Welcome Dinner Reception (hosted by NZ Parliamentarians' Group on Population and Development: NZPGPD)

Saturday, May 5, 2001 (2nd Day)

Session II: "Food Security and Population Issues"
—Environment and Sustainability—

9:00 – 10:30 Chairperson: Mr. Lakshman Singh, MP, Vice Chairperson, AFPPD (India)

① Sustainable Food Security for All
Speaker: Prof. Vo Tong Xuan, President of Angiang University (Vietnam)
② Population and Food Security: Early Research Results from the Philippines
Speaker: Prof. Ian Pool, Demographer, Waikato University (New Zealand)
③ Food Security, Population and Free Trade
Speaker: Sen. Dr. T. Marimuthu, MP (Malaysia)

10:30 – 10:45 Tea Break

10:45 –12:00 Discussion

12:00 – 14:00 Lunch (hosted by Asian Forum of Parliamentarians on Population and Development: AFPPD)

Panel Discussion: "Globalization and Sustainable Development
—Future of Asia and the Pacific—

14:00 – 15:00 Summary of Session I & II

Moderator: Prof. Vo Tong Xuan, President of Angiang University (Vietnam)

Panalists :

- Dato' Napsiah Binti Omar, MP (Malaysia)
- Dr. Muneaki Samejima, MP (Japan)
- Mr. Alymbay Sultanov, MP (Kyrgyzstan)
- Mr. Falemoe Leiataua Tolfuaivalelei, MP (Samoa)

15:00 – 15:15 Tea Break

15:15 – 17:00 Discussion

Closing Ceremony

17:00 – Address : Ms. Kayoko Shimizu, MP, Vice Chairperson, APDA (Japan)

Address : Mr. Yoshio Yatsu, MP, Chairperson, AFPPD (Japan)

Address : Dr. Gill Greer, Executive Director, Family Planning Association (NZ)

Farewell Address: Ms. Anne Tolley, Vice Chairperson, NZ Parliamentarians' Group on Population and Development (NZ)

18:30 Dinner Reception (hosted by Asian Population and Development Association: APDA)

OPENING CEREMONY

Welcome Address

Hon. Ms. Judith Tizard
Minister of State of New Zealand
Read the Address of
Hon. Ms. Annette King, Minister of Health /Racing (NZ)

Opening Address

Ms. Steve Chadwick, MP (NZ)
Chairperson, NZPGPD

Opening Address

Ms. Kayoko Shimizu, MP (Japan)
Vice Chairperson, APDA
Read Address of
Dr. Taro Nakayama, MP, Chairperson, APDA (Japan)

Address

Mr. Yoshio Yatsu, MP (Japan)
Chairperson, AFPPD

Address

Mr. Colin Hollis, MP (Australia)
Secretary General, AFPPD

Address

Mr. Kunio Waki
Deputy Executive Director, UNFPA

Keynote Address

Hon. Ms. Luamanuvao Winnie Laban, MP (NZ)

Welcome Address

Hon. Ms. Judith Tizard
Minister of State of New Zealand
Read the Address of
Hon. Ms. Annette King, Minister of Health /Racing (NZ)

Welcome to New Zealand to this most important conference. I hope you enjoy your stay here, and I have no doubt that your deliberations will be of immense importance to the continuing debate on population and development issues, particularly those affecting food and water resources.

The Asia region, home to 60 percent of the world's population, must provide a strong lead to the rest of the world on population and development issues. This meeting provides a strong ideal forum through which to provide such a lead.

Under health reforms that have been put in place since the Labour-Alliance Government came into office in New Zealand in 1999, the Ministry of Health has been restructured to include, among other changes, a public health directorate that will focus on policy issues.

This development has been long overdue. Public health issues are important throughout the Asia region, and New Zealand will now be able to speak with a far more authoritative voice.

I believe it is appropriate today to talk to you briefly about the main changes, both philosophical and practical, this Government has made to the health system in New Zealand.

But before I do so, it must be accepted that New Zealand today is no different to countries the world over in facing many challenges in addressing important population health issues.

In New Zealand, as elsewhere, the demand for health resources will always outweigh the financial and human resources that are available. That means we must ensure that we use those resources we do have as effectively as we possibly can.

That is an important reason New Zealand has developed its first New Zealand Health Strategy for a decade. The strategy was launched in December last year and sets the Government's overall platform for action on health.

The Strategy was developed to restore a public health system people can trust; to provide a system available to everyone when they need it, regardless of their ability to pay; and to provide a system that will help reduce health inequalities.

There is a strong emphasis within the Strategy on taking an inter-sectoral approach to reducing health inequalities, particularly the inequalities between the health status of Maori and Pacific people and other New Zealanders. The inter-sectoral approach recognises that determinants such as poverty, education, employment and housing are just as important as promoting healthy lifestyles and providing accessible health services.

The New Zealand Health Strategy has the broad goals of improving the health status of New Zealanders, reducing inequalities, emphasising public accountability and improving coordination in the health sector. Within this strategy, the Government has highlighted thirteen population health issues to focus on in the short to medium term. A number of these health issues, such as obesity, child health, cardiovascular disease, smoking and diabetes, are common to many countries in the Asian and Pacific region today.

It is worth taking the time to consider some of the health statistics that have led us to establish these priorities.

- One in six New Zealanders (more than 550,000 people) suffer from asthma. Four years ago more than 10,000 New Zealanders were hospitalised with asthma. We have the second highest rate among 14-year-olds in the world. We are unsure whether the rate of asthma is affected by socio-economic factors.

- New Zealand continues to rank far too highly in terms of mortality rates from coronary heart disease. In 1996, for example, 150 New Zealand men per 100,000 died of coronary heart disease. The latest and enviably low figures I have seen for Japan (1994) are 30 men per 100,000, Hong Kong (1994 figures) 51 per 100,000, and in Korea (1995 figures), 22 men per 100,000.

- We have a worsening situation with respect to diabetes, where New Zealand is part of a worldwide epidemic. Diabetes may already consume 10 percent of our personal health expenditure.

- New Zealand is adopting a series of initiatives to reduce smoking. The four-fold approach involves taxation, education, legislation and subsidisation of nicotine replacement therapy. It seems likely that 60,000 smokers will attempt to quit using subsidised NRT.

Those few examples illustrate just how much work we have to do in this country. I am sure many of you face similar problems.

A common pattern exists in all countries where more disadvantaged groups have poorer health, greater exposure to health risks and poorer access to health services. In countries with a colonial past, like New Zealand, indigenous peoples have poorer health, even when social and economic status is taken into account.

Of particular relevance to the theme of this conference are the issues that New Zealand faces in the area of nutrition. Unlike many developing countries, New Zealand has a plentiful food supply and safe water at a population level.

However, there is a growing awareness that the distribution of food at a family and individual level is unequal amongst certain populations. While the health sector can certainly play a vital role in working to address this issue, other sectors across the wider social and economic spectrum must also accept equal responsibility.

Associated with poor nutritional status and obesity is the concept of food security. Food security is an internationally recognised term that refers to the ready availability of nutritionally adequate and safe foods, and to the assured ability to acquire personally acceptable foods in a socially acceptable way.

Food security affects two broad aspects of life: ill health due to poor nutrition and a lower quality of life. Both are important public health issues in New Zealand.

In developed countries indicators of food security are not as pronounced as the more usual symptoms of malnutrition that occur in developing countries. However, issues arising from ill health and poor nutrition due to food insecurity, include increased rates of death from cancers, heart disease and infection, food-borne illnesses, increased obesity, and lower intakes of fruits and vegetables. Quality of life issues include psychological stress and social isolation.

In New Zealand the issues surrounding food security focus on a safe and nutritionally adequate food supply at the national and household level; stability in the food supply; and on ensuring that each household has physical, social and economic access to enough food to meet its needs.

Food security for our indigenous Maori population in particular embraces the much broader issues of the

safety and quality of the water supply, foreshores, forests and other areas of traditional collection of seafood.

Of particular concern is the increasing level of obesity and overweight people in New Zealand. Fifty percent of New Zealanders are now considered as overweight.

Populations within New Zealand that experience higher numbers of overweight people and levels of obesity, such as Maori and Pacific peoples, also experience greater food insecurity.

This association may well be due to the consumption of low cost foods that have high fat and sugar contents, resulting in increasing body weight.

In New Zealand, like other countries internationally, more women than men bear the burden of food insecurity. This may be due to women's poorer social and economic circumstances, and because women are more likely to be responsible for getting in food provisions in a household, and therefore to bear the brunt when there is not enough money to buy food.

Maori and Pacific people experience greater food insecurity than European New Zealanders and are over represented in the lower income groups.

Those on lower incomes are more likely to have less variety in their diets and have inadequate intake of fruit, vegetables and dairy products.

Young adults are also more at risk of food insecurity and more likely to run out of food and rely on food banks than older people. Yet these are the years when healthy eating is important in the prevention of future problems such as osteoporosis, raised blood cholesterol and high blood pressure.

The New Zealand government supports the good work of the Asian Population and Development Association and agrees that affordable, appropriate and accessible food is vital if people are to lead healthy, productive and happy lives.

I hope this meeting moves us towards a greater understanding and awareness of population and development issues, and their impact on the health of all our peoples.

Opening Address

Ms. Steve Chadwick, MP (NZ)
Chairperson
NZ Parliamentarians' Group on Population and Development

Ni hao ma, Konichi Wa and Kia Ora Koutou, noumai haere mai ki Aotearoa.

To Senator Kayoko Shimizu, vice chair APDA, Kunio Waki, deputy Director General UNFPA, Yoshi Yatsu, Chair AFPPD, fellow Parliamentarians from the Asian region, my colleagues in New Zealand, the Hon. Judith Tizard, those from the International Planned Parenthood Federation and the Family Planning Association of New Zealand, welcome to our beautiful country for your two day conference.

You will be confronting and revisiting issues that impact on the balance of our global, Asian and Pacific populations, such as the importance of the environment, water quality, the food chain, access to basic health service provision and education.
These are all crucial components that any country must endeavor to protect to enhance our greatest assets - our own people.

The days of remaining focused only on our own backyard are long gone and every country acknowledges a civic responsibility to participate and contribute to the wider world and assist the developing nations to gain independence through interdependence.

We in New Zealand do need to heed the following proverb or whakatauki:

"Matua whakapai i tou marae, ka whakapai ai I te marae o te tangata."

"First set in order your own courtyard before you clean up others."

In New Zealand

- We are *grappling* with environmental protection that is balanced with primary production and tourism as our prime sources of earnings.
- We are *rebuilding* our connection with communities while facing increasing competition for economic survival.
- We are *defining* our millennium nation state while endeavoring to protect the tangata whenua as the first nation people of the land.
- We are *confronting* our own fabric of society with increasing pressures on morality and changing values.
- We are *developing* skills and focusing on education to meet production demands while facing population shifts of our own children overseas. Immigration policy is being revised to open our country to those with the skills we need.
- We have *reshaped* our health service focus on the prevention of ill health and rebuild democratic participation in decision making.

This new government has a busy agenda and we are maintaining a high profile overseas as well. Our Prime Minister has just returned from a tour to Asia.
As the Chair of the New Zealand cross parliamentarian committee it gives me great pleasure to speak and welcome you all here today.
Our committee has had a most successful year of meetings shared with many dignitaries and visitors from around the world.

We have had nearly half a dozen international visitors to our meetings from such places as Britain,

Bangladesh, Fiji and the US. It's not a bad tally really when you consider that our group only meets every three months.

As a committee, supported ably by FPA, we have developed an agenda item for the next Commonwealth Heads of Government meeting.

This calls upon the Commonwealth to focus on addressing access to quality basic education, especially for girls and women in the Pacific region.

We also asked for a renewed commitment to addressing the HIV and Aids pandemic and requested an audit of the commitments made at the International Conference on Population and development at Cairo in 1994.

We also request that efforts continue to realize the goal of reproductive health for all by the year 2015. To remind you this goal included :

- Maternal care.
- Quality family planning and infertility services
- Prevention and treatment of reproductive tract infections, including sexually transmissible infections and HIV and Aids.
- Information, education and counseling on human sexuality
- Prevention and treatment for cancers of the reproductive system.

These are all aspects this country is working on within our New Zealand Health Strategy which was launched in February this year and was followed by a Primary Health Strategy.
We have a long way to go as evidenced by two major reviews of cancer sufferers that are very topical at the moment. We are also concerned at our worsening sexually transmitted infection rate and teenage pregnancy rates.

- STI

We are facing an increase in chlamydia rates in the under 25 years of age group with 70% of all those infected in this age group.
Rates among Maori have increased by 61%.
Genital warts are still the most frequently seen cases of sexually transmitted infection.
The Environmental, Science and Research (ESR) surveillance data also suggests that we do not have a comprehensive data collection system in NZ and we could be under reporting by as much as 50% because General Practice and some Family Planning clinics not run by FPA are not reporting to ESR.

- HIV/AIDS

There have been a total number of 1336 cases between 1980 and 1998. In 1998, NZ had 105 new cases of HIV/Aids reported. This was a sharp increase and was due to immigration patterns, 43 of these 105 cases were largely from Africa. Since 1984, 178 reported cases were women who had contracted the infection by heterosexual contact while overseas. 1259 cases were male. Seventy six per cent of reported cases till June 2000 were pakeha and six per cent are women.

- TEENAGE PARENTS

NZ has a higher teenage pregnancy rate than other OECD countries. Our rates are similar to those in England, Wales and Scotland.
In the 13-17-year-old age group 9.5 per 1000 live births equates to 2.2% of all live births.
The Maori rate is 26.2 per 1000 live births. This is five times greater than non-Maori at 4.9 per 1000.
Pacific Island rates are 17 per 1000 live births which is twice the average rate.

The newly structured health sector will be charged with addressing these issues at a local level. There is much that needs to be done in our own backyard.
We also need to be forever vigilant on overseas events.

Only this week in the House of Parliament my committee tabled a "Notice of Motion" strongly rejecting the new American administration decision to re-enact the Mexican Gag rule of 1994. This will have the impact of the withdrawal of American Aid funding to 35 developing nations who deliver family planning and abortion education and treatment services. This could result in 73,000 deaths of women forced back to unsupported termination of pregnancy. We are very concerned at this decision.

The influence of an international network such as ours can be very effective if we work collectively to make a difference. We should never be daunted at the enormity of the workload ahead. Occasions such as this conference are so important in the development of a support network on a geographical basis and to also have fun together as we learn about our cultures.

I wish you well in your deliberations and the pleasures of networking to share ideas and fellowship.

Opening Address

Ms. Kayoko Shimizu, MP (Japan)
Vice Chairperson
The Asian Population and Development Association (APDA)
Read Address of
Dr. Taro Nakayama, MP, Chairperson, APDA (Japan)

Hon. Ms. Annette King, Minister of Health & Racing,
Ms. Steve Chadwick, MP, Chairperson, New Zealand Parliamentarians' Group on Population and Development
Hon. Yoshio Yatsu, Chairman, Asian Forum of Parliamentarians on Population and Development,
Honourable Parliamentary Delegates,
Mr. Kunio Waki, UNFPA Deputy Executive Director,
Datuk Dr. Raj Karim, Regional Director of East and South East Asia and Oceania Region of IPPF and
Distinguished lecturers,

As we celebrate the opening of this important meeting let me express my heartfelt welcome and gratitude to all of you for attending the Asian Parliamentarians' Meeting on Population and Development.

My special appreciation goes to Dr. Gill Greer, the Executive Director and members of the New Zealand Family Planning Association for their commitment and generous cooperation. Without the cooperation of the New Zealand Parliamentarians' Group on Population and Development and the members of the Family Planning Association it would not have been possible for us to organize this meeting here. On behalf of the organizer I very much like to express my profound thankfulness to your untiring efforts and cooperation.

As many of you must feel the same, I had personally looked forward to being part of the meeting here in beautiful Auckland. However my public duties prevent me from joining you this time.

This meeting as you know is its seventeenth. We are proud that we have regularly held this meeting in one of the Asian and Pacific countries in the last sixteen years, a feat without parallel as parliamentarian activities on population and development.

APDA and AFPPD were born at the same time as an embodiment of our conviction that it was essential for elected representatives to be deeply involved in order to solve the population problems that have a decisive impact on the future of humankind and to realize a sustainable development.

In the last two decades, AFPPD and APDA have, as twin organizations continued to work closely in a most effective and collaborative manner.

APDA too wishes to congratulate the New Zealand Parliamentarians' Group for becoming a regular member of AFPPD.

The purpose of the APDA meeting is to provide information to the parliamentarians in order to solve global population problems and to realize sustainable development. It is to provide a forum for distinguished members to exchange experiences and thoughts and to equip ourselves to enlist national governments.

The theme of the meeting: "Food security, water resources and population in Asia and Pacific" was chosen to reflect the importance of these issues. The twenty-first century is referred to as the century of water and life. Water, particularly fresh water resources, is a finite resource, most important to humankind.

According to one of various estimations, fresh water resources available for human use is merely 9 out of hundred billion parts of the total water of the earth itself.

A huge body of water surrounds the pacific region but as seawater it is not to be used directly for drinking or for grain production. Water resource humans can use is one that circulates; is heated by solar energy, evaporated and precipitates back to earth as rain water.

In Antarctic and Greenland there are vast fresh water resources as glacier and ice beds. Its use is a challenge because it can cause new problems such as elevating the sea level.

Food is essential for human living. On the other hand, the world population continues to increase notwithstanding the enormous efforts to control the rate of increase.

According to the UN World Population Prospects 2000, the world's population originally estimated at 8.9 billion in the year 2050 was revised upward to 9.3 billion. The reason is that the rate of increase of the population has not been successfully brought down as hoped.

It is estimated that 70 million people will be added every year for some time to come. In the task to supply food to feed this population base the greatest constraint factor is the freshwater resource. How can we support the growing population with finite water resources? This is the question behind the choice of the main theme--water and food security.

We hope that the meeting will not only deliberate on population increase, fresh water constraints and the food crisis that those may cause but also consider what these issues all mean as we strive to survive on the limited planet.

This is the first time in APDA's seventeen meetings that Oceania has been selected as its venue. In contrast to the venues of the past meetings, Oceania represents a vast region surrounded by ocean but unlike Asian region with relatively small population base.

The region has kept the nature in its best. New Zealand suggests the kind of richness a small population base can enjoy. At the same time it is a region that has numerous small island stated than can be adversely effected by environmental vulnerabilities.

Environmental and population problems are both global issues that are not limited to one country or a region. The impacts are felt across national borders even the region and fall on the entire planet. In order to solve regional problems and cope with global issues we as members of parliament have a big role to play. In this context there is a large significance in holding our meeting here in Oceania.

Today many of the developing countries suffer from poverty and population increases while many developed countries continue to consume excess energy and food.

It is the smaller developing countries that are hard hit by environmental destruction and population explosion. Some island states are feared to lose their existences due to rising sea level.

For the humankind to live together on the planet earth the only way is for the developed countries to rethink their excessive consumption while the developing countries would do their utmost to implement programs to abate population increase.

In this sense, it is extremely regrettable that the world's largest energy consumption country, the United States of America has declared its intention to secede from the Kyoto Protocol to prevent global warming.

New Zealand provides the most apt venue for us to discuss the issues of fresh water resources and food security that constrain human survival.

In addressing the important themes we are fortunate to have been able to invite the world's authorities in respective fields of expertise.

Dr. Zenbei Uchijima, the President of Miyazaki Municipal University who is an expert on hydrology and food production, Dr. Xuan of Angiang University who has promoted the green revolution in Vietnam and played a leading role in increasing food production. Most aptly he is a recipient of Magsaisai Award, dubbed the Nobel Prize in Asia. We have Dr. Abeykoon from Sri Lanka who will talk to us on population increase and development. Given the limited space of an island country Sri Lanka's history is one of developing irrigation system amidst population increase. How does one survive in a limited land space? The case study of Sri Lanka should give all of us some enlightened hints in thinking about our future. We also have two speakers from the Pacific region. Dr. Chris McMurray from Australia who is now working as demographer at the Secretariat of the Pacific Community in New Caledonia. We have Prof. Ian Pool, the Director of Population Studies Centre in University of Waikato.

Again we are very pleased that we could all be together in the beautifully green country to address these important issues in the first year of the new century. In closing my opening address let me say I know you will do justice to yourselves in producing the fruit of your thought and leadership.

Thank you for your attention.

Address

Mr. Yoshio Yatsu, MP (Japan)
Chairperson
Asian Forum of Parliamentarians on Population and Development (AFPPD)

Hon. Ms. Annette King, Minister of Health & Racing,
Ms. Steve Chadwick, MP, Chairperson, New Zealand Parliamentarians' Group on Population and Development
Dr. Taro Nakayama, Chairman, Asian Population & Development Association
The Honourable Delegates,
Mr. Kunio Waki, UNFPA Deputy Executive Director,
Datuk Dr. Raj Karim, Regional Director of East and South East Asia and Oceania Region, IPPF
Distinguished lecturers,

I thank each and every one of you for coming to the Seventeenth Asian Parliamentarians' Meeting on Population and Development.

Ms. Steve Chadwick, MP, Chairperson, and members of New Zealand Parliamentarians' Group on Population and Development (NZPGPD), Dr. Gill Greer, the Executive Director of New Zealand Family Planning Association and the members of New Zealand Family Planning Association, I thank you most sincerely for your very generous cooperation. Also a word of sincere appreciation to APDA for organizing this meeting and for its unwavering supports.

Let me take this opportunity to express my congratulations to the members of New Zealand Parliamentarians' Group for at last becoming a regular member of our organization after serving it as a diligent associate member.

The theme of this meeting is Food Security, Water Resources and Population in Asia Pacific. It is most insightful that the most challenging themes of the 21st century were selected for discussion in its first year.

This is the fifth year since the FAO World Food Summit was convened with the commitment to liberate all peoples from hunger. Later in November there will be a meeting at the FAO Headquarters in Rome at which progress report since the adoption of the Rome Declaration and Plan of Action will be deliberated.

Food problems are a sequel to population problems. This is to say that the basic food issue is to feed the growing population.

The Rome Declaration on World Food Security adopted by FAO Summit in 1996 declared at the outset: "*We, the Heads of State and Government, or our representatives, gathered at the World Food Summit at the invitation of the Food and Agriculture Organization of the United Nations, reaffirm the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger.*"

It also pledged: "*We pledge our political will and our common and national commitment to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015.*"

It is still fresh in my memory what Fidel Castro; Prime Minister of Cuba said challenging all whether the world would allow 400 million people to die of hunger even in year 2015.

What then is the present state of affairs? It is estimated that the world hunger rather than decreasing, has

now increased to 1.2 billion from what it was forecast as 800 million in 1996 when the Rome Declaration was adopted. One out of every five people in the world is starving today.

The present problem of hunger is mainly caused by social disparity. Now the issue of hunger is not so much caused by poor harvest or bad weather. It victimizes the poor who have no social ability to purchase food. In other words, today some people are left hungry even in regions where there is a bumper crop. On the other hand there are some that feed themselves shamelessly excessively in regions where harvest is poor.

Needless to say, the biggest social discrepancy lies between the north and the south, between the developed and developing countries. However, even among the so-called rich countries of the developed world there are those who suffer from hunger. And there are people in the least developed countries who continue to over feed themselves and continue to slander resources.

This is a major economic and social problem. The issue has become complex, reflecting domestic and historical circumstances of each country. No panacea has been found nor appropriate measures put in place to solve this dire problem.

We, as members of parliament elected by our peoples to implement necessary policies, must address these issues. There is no question that we must expeditiously improve the present situation where, under rigid class distinctions, the poor are robbed of their educational and other opportunities.

International cooperation, needless to say, is essential to address these important issues. However, they are domestic issues as well and, as such, require political will to adopt needed policies.

The importance of these contemporary issues cannot be denied. But there is a more substantial problem before us.

As an analogy, let us compare the total weight of the earth to that of a human body. It shows that all life is only as big as the size of a single eyelash. This is the shockingly inconsequential nature of our existences. They are sustained mainly by solar energy and fresh water resources, which the plants need for their photosynthesis and, in turn, animals, depend on plants for their survival.

Broadly speaking, if the solar energy we receive is constant then the fresh water resources that circulate with the sun's heat is also basically constant. In other words, our lives are supported by the limited energy and circulating water.

Our life may be ephemeral and fleeting but to each of us it is a precious gift. To protect this precious life today and tomorrow is the mandate of all of us living today. In this context as Dr Nakayama pointed out the activities we undertake to manage population are indeed activities to protect human dignity.

Today the humans are corroding the biosphere. The continuous increase of human population in the biosphere which has limited capacity means that we are robbing life from other species. It must also be noted that human beings are not only multiplying as biological creatures but consuming more energy as a result of technological progress we enjoy and as a result unduly placing a burden on the planet.

The world population today has exceeded the six billion mark and continues to add about seventy million each year. In order for us humans to survive there is a need to continue to supply food to the increasing population

Can we realistically continue to support this growing population? The greatest impediment to increased food production is the shortage of fresh water resources. The amount of the fresh water resources we are able to use is basically limited to hydrologically circulating water.

The fresh water resources are far fewer than we imagine. Across the globe we are witnessing water stress

and water shortage. For example, it was reported recently in the press that neighbouring countries of Israel are offended because it signed a contract to purchase water from Turkey.

The Middle East and North Africa face serious situations due to shortage of water resources. This notwithstanding, the population increase in these regions is explosive presenting a serious challenge to feed the increasing population. It is predicted that in the future, the focus of the world conflict will not be the petroleum and energy but water.

With the shortage of water resources and further pressure of growing population and industrialization, it is feared that agriculture may cause destruction to the environment. The resulting soil erosion can compromise the very foundation of food production. Food of course is essential to human survival. Without being liberated from hunger no man can have dignity. In this sense food is not just a commodity.

Today our world has become interdependent as never before. Food is considered one of the essential commodities distributed to various consuming centers from producing areas around the world. Japan is particularly dependent on food import. In fact, grain import of Japan account for more than seventy percent of her consumption.

Food is traded as an international commodity in accordance with the rules of international trade and, as such, contributes to enriching our lives. In an interdependent world it is extremely important that food be produced where most appropriate. However, the problem is that present trading rules appear to consider food merely as a commodity.

Under the present trading rules the principle of comparative advantage determines suitable places of food production. It is considered that in this way the load on the environment will remain small and that higher production efficiency will maximize the overall utility.

Given the continued population increases and shortage of fresh water resources can we be sure that food supply can be guaranteed under the principle of comparative advantage? Let us assume for the sake of argument that there was an increase in population in food producing countries. Would they continue to export food when there is less excess food for export?

Ruthless application of the present rules of food trade that considers food as a mere commodity means that countries with high population density or disadvantaged from an environmental point of view cannot continue to produce food.

The leading economic principle of comparative advantage does not take into account the possibility of continued population increase, economic effects on environment and water resources and land. In other words the whole assumption is pegged on a stable population and abundant land and water resources to support food production.

When the environment essential to food production is deteriorating or resources becoming scarce the principle of comparative advantage can hardly be regarded as unconditionally correct.

We have already noted that the nature of today's hunger is more an economic and social problem, where there is abundant food but not appropriately distributed. Even today there are 1.2 billion hungry people. What if the environment were to deteriorate further and fresh water resources became acutely short? With less capacity to produce and an overall shortage of food, would the governments around the world be able to maintain the dignity of their people?

Food is an extremely important commodity. Given the high degree of interdependency of our world it is unreasonable for any country to attempt to achieve self-sufficiency. At the same time, however, to rely totally on import for one's own food is tantamount to renouncing one's national food security. It further means that a food-importing country will lose strategic options available to it.

Considering the future of humankind, it will be of great significance to maintain the possibility of food production. Under the present international trading rules and economic perspective, it is essential to have the possibility of food production even if it is not economically viable.

Mindful of further increase in the population, the constraints of fresh water resources and the possibilities of soil erosion and further urbanization, it seems to me crucial that we adopt a global food security initiative. Such a strategy should enable us to maintain food supply to the growing global population and protect the potential of food supply.

Today many of the most powerful industrial countries are food exporters. In this context, food is unmistakably an important strategic commodity. I feel strongly that for humanitarian reasons food should not be used to satisfy a given country's political interest or as a strategic tool.

From this perspective, environmental as well as humanitarian, it is unreasonable for industrial countries to invest profits from their industrial sectors into agricultural sector and to use the export for strategic purposes. Think of the impact this strategy will have in terms of the load on the environment and on food production base of other countries.

As we turn our eyes to the global food security it is necessary that developed countries will change their gluttonous eating habits and consumption lifestyles while developing countries do their utmost to suppress their population increase. At the same time as declared in The Hague Declaration of International Forum of Parliamentarians on ICPD Review in 1999 there is an urgent need to maintain a global perspective as well as establish a long-term rationale in international trading rules.

As politicians elected by our peoples to represent them we have the obligation to feed them and not let them go hungry. In this sense the most important is to maintain the potential of agricultural production beyond economic benefits.

It is expected that the population will increase beyond and above what has been estimated. The rate of increase of population in the high-fertility countries has not been declining as hoped for. Our role as elected representatives has never been so great.

There is fiscal pressure on every country today. However, under the circumstances each developed country, and for that matter, each developing country should face the future squarely and have the discipline to do what it must for the future of the earth.

While Japan is reeling from a huge fiscal deficit, our host country New Zealand has dramatically succeeded in fiscal rehabilitation. We must learn from New Zealand and do what we can to continue to play our international role in the future.

It must be reiterated that what lies beneath all the global problems is the challenge of the population increase. The will of us politicians is extremely important in solving the population problems, realizing the sustainable development and to making our collective future bright. Let us work together for the future.

We are indeed fortunate to be able to meet here in the beautiful city of Auckland and to have the opportunity to discuss these important issues at the beginning of the 21st century with parliamentary colleagues from Asia and the Pacific. I am confident that we will again bring our earnest and serious attention to the issues at hand.

I thank you for your attention.

Address

Mr. Colin Hollis MP (Australia)
Secretary General
Asian Forum of Parliamentarians on Population and Development (AFPPD)

The Hon Mrs Kayoko Shimizu
Hon Mr Yoshio Yatsu MP, Chairperson, AFPPD (Japan)
Mr Kumo Wahi, Deputy Executive Director, UNFPA
Hon Ms Annette King, Minister of Health/Racing of New Zealand
Hon Mr Steve Chadwick MP, Chairperson, NZ Parliamentarians' Group on Population and Development, New Zealand,
other distinguished guests, ladies and gentlemen:

I am pleased to be with you for this important meeting especially as it is being held in one of my favourite cities, Auckland, New Zealand. The individual themes of Food Security, Water Resources and Population deserve a separate forum – but each is interlinked, especially if we are to have a sustainable development for the future of humankind.

The emphasis regarding the question of population and reproductive health has enlarged and expanded over the years to encompass food security, safe drinking water, gender equity, domestic violence, housing and more recently HIV/Aids. If proof was needed on the importance of a topic it is to have a United Nations conference on the topic – in June there will be a forum on HIV/Aids in New York at which the AFPPD will be represented - HIV/Aids is devastating much of the world. The figures in Africa are staggering, but world wide so is the debate, taboos, misunderstanding, misinformation and denial staggering. Too many governments are in denial including, I am sorry to say, many of the Pacific Islands and let me say, although in the Pacific Island Nations the numbers are not as great as Africa, the proportion of the population and its social impact is as great.

To counter Aids, as has been shown in countries such as Thailand and Uganda, needs strong government leadership. The lead must come from Political, Religious and Social leaders. It is a sensitive issue, but so is death and the death of our young people must challenge us all in regards to the sensitivities.

I look forward to the papers and discussion over the next two days – I wish the conference well, thank you.

Address

Mr. Kunio Waki
Deputy Executive Director
United Nations Population Fund (UNFPA)

Hon. Ms. Judith Tizard, Ms. Winnie Laban, Ms. Steve Chadwick, Mr. Yoshio Yatsu, Ms. Kayoko Shimizu, Mr. Shiv Khare, Dr Raj Karim, Dr Gill Greer,

Honourable Parliamentarians, Ladies and Gentleman,

It gives me great pleasure to address this meeting of the 17th Asian Parliamentarian Meeting on Population and Development. Ms. Thoraya Obaid, the new Executive Director of UNFPA, has asked me to convey her warm personal greetings to you all. And I would like to congratulate and thank Dr. Taro Nakayama, President, Asian Population and Development Association (APDA) and Mr. Tsuguo Hirose, Executive Director of the APDA for organizing this meeting in this beautiful city of Auckland. Special thanks to our hostesses, Ms. Steve Chadwick, MP, Chairperson, NZ Parliamentarians' Group on Population and Development and Dr. Gill Greer, Executive Director, Family Planning Association, New Zealand. I would also like to acknowledge the important support provided by the Asian Forum of Parliamentarians on Population and Development (AFPPD) under the leadership of Mr. Yoshio Yatsu, Chairman of AFPPD, and Mr. Shiv Khare, Executive Director of AFPPD.

The theme of our meeting is "food security, water resources and population issues in Asia and the Pacific". I would like at the outset to acknowledge here the contribution of the Asian Parliamentarians including Mr. Shin Sakurai and Mr. Yoshio Yatsu in calling attention to the importance of maintaining a balance between population dynamics and food and water security during the 5 year review of the ICPD Programme of Action.

Last September world leaders came together at the United Nations headquarters for the Millennium Summit to reflect on the role of the United Nations in the 21st century. They looked with satisfaction at the progress achieved - longer life expectancy, better nutrition, better health, and better education. And they also considered the problems that continue to persist, including widespread poverty, inequality, conflict, disease and environmental depletion. The Millennium Declaration, that world leaders adopted, set a number of mutually reinforcing goals to overcome these problems. The goals, based on the global United Nations conferences of the 1990s, mark a strong commitment to eradicate poverty, to reduce maternal mortality, to prevent the spread of HIV/AIDS, to move towards gender equality, to protect the environment and promote sustainable development. .

Population growth remains a phenomenon of major concern, especially in the least developed countries. According to the latest United Nations' population projections, the world's population will grow from 6.1 billion in mid-2000 to 7.9 billion in 2025. That is, nearly 2 billion persons will be added to the global total over the next 25 years. Much of this growth in numbers will take place in the Asia and Pacific region – especially in the already populous countries of India, China, Indonesia, Pakistan and Bangladesh. Over this period, rapid urbanisation will continue, with the proportion of Asia's population living in urban areas growing from 37 per cent today to 51 per cent in 2025.

Population, Food Security and Water Security

The implications of rapidly growing and rapidly urbanising populations remain far-reaching - particularly where poverty levels are high, where air is polluted, where water is scarce, and where land degradation and deforestation are most severe. Simply stated, continued population growth increases food and water insecurity. Natural resources, including water, agricultural land, forests and coastlines continue to be

degraded by over-use. And the urban sprawl also places a strain on land and water resources, threatens sustainability and endangers health. It's the poor who suffer disproportionately, especially women and children.

Food consumption patterns differ between developed and developing countries and between the rich and the poor within countries. Even within families there are gender bias in access to food that frequently disadvantage women. In several countries there has been progress in formulating policies related to food and water security. But countries face capacity constraints in implementing these policies, including lack of suitable data, financial resources and technical manpower.

Through its country and inter-country programmes, UNFPA is providing support for a number of initiatives aimed at clarifying the relationships between population, the environment and sustainable development. For example, in India, where water scarcity is already acute in many parts of the country, the Fund is supporting a research project on the relationship between population growth and distribution, and water availability. The research is looking into the effects of population growth on village water supply for agricultural and domestic use, as well as its consequences for land use, housing and sanitation.

At last month's Commission on Population and Development held in New York, UNFPA was greatly pleased to hear an intervention by Professor Joel E. Cohen of the Rockefeller University and Columbia University in which he asserted that "culture matters". He noted that "without an understanding of [the various] aspects of culture, we have little chance of understanding how population, development and the environment interact." Their interactions, are profoundly affected by components of culture, such as politics, laws, institutions and values. Political institutions, like Parliaments, can play a critical role in this interdependent relationship between population, development and the environment.

Challenges facing Asia in the 21st Century

Asia's successes can not be taken for granted, as the impact of the financial and economic crisis of the late 1990s showed. The crisis caused an interruption and reversal of the region's remarkable development gains. Declining exchange rates and substantial reductions in government budgets curtailed spending on, *inter alia*, population and reproductive health programmes, including family planning programmes. In brief, the crisis exposed the vulnerability of population and development programmes in several Asian countries. Particularly affected were the poorest communities, especially women and children, in contexts where social safety nets were lacking and reliance had to be placed on traditional family support systems. Strengthening and sustaining basic social services, and targeting them towards the poor and other under-served groups, remains a major challenge.

In parts of Asia high population growth rates still persist and exacerbate efforts to reduce poverty levels and improve the quality of life. With increasing population, pressures on food and water security mount. Despite significant gains in food production, there are large numbers of chronically malnourished people living in Asia, especially in South Asia. And one in three Asians lacks access to safe drinking water. Further, water pollution through bacterial waste from human sources continues to threaten good health. Governments will have to continue to give priority to population and development programmes. They will need to commit sufficient resources to increase access to services and to meet the unmet need for family planning information and services.

Adolescent reproductive health continues to be a difficult issue for many Asian nations to address. The ICPD Programme of Action underlined the importance of providing information and services to meet the reproductive and sexual health needs of adolescents. Sometimes the provision of services and education for young people, especially the unmarried, are considered as too sensitive for government agencies to tackle. Yet in most, if not all, countries, there is increasing recognition that high-risk behaviour among adolescents and youth is an important factor in the spread of HIV/AIDS.

Another challenge facing Asian countries is preventing the HIV/AIDS pandemic from reaching the

devastating proportions being experienced in sub-Saharan Africa. Targeting information and services at adolescents and youth not affected by HIV, is a key strategy for meeting this challenge.

Perhaps the greatest challenge that will face Asian countries during the early decades of the 21st century is meeting the needs of the growing number, and proportion, of older persons in their populations. Population ageing in Asia is occurring much more rapidly than was the case with the earlier experience of Western countries. Already the majority of the world's older persons live in Asia. Issues relating to the health, well-being and welfare of older persons are particularly critical in those countries where few provisions for support exist outside of the family. Such problems will become especially acute in low-fertility settings where traditional patterns and practices of support are likely to be unsustainable. The social safety net for the Asian elderly has always been the extended family; but urbanisation has weakened extended family ties. One policy and programme challenge is to promote active ageing and encourage the positive contributions of older persons to society so as to help strengthen inter-generational solidarity.

In conclusion, let me say that parliamentarians have had, and will continue to have, a critical role to play in advocating for, and creating awareness about, population and development issues. You can also play an important role in enacting appropriate legislation to address population and development issues, including creating an enabling environment for civil society and the private sector to also contribute to sustainable development. UNFPA will continue to support your excellent efforts to ensure food and water security for all. But a lack of financial resources remains one of the chief obstacles to achieving the population and development goals of the ICPD Programme of Action. The need for increased resources, both national and international, is especially urgent in view of the common aim to eradicate poverty, as well as for advancing towards other population and development goals. I know that I can continue to count on each of you for your commitment and support to help mobilise people for the achievement of our common global goals and mobilize the needed financial and manpower resources.

Thank you.

Keynote Address

"Population and Development in the Island Nations of the Pacific"

Hon. Ms. Luamanuvao Winnie Laban, MP
Parliament of New Zealand

"So vast, so fabulously varied a scatter of islands, nations, cultures, mythologies and myths, so dazzling a creature, Oceania deserves more than an attempt at mundane fact; only the imagination in free flight can hope - if not to contain her - to grasp some of her shape, plumage and pain." Albert Wendt.

E muamua ona ou ta le vai afei ma ou fa'atulou i le paia lasilasi ua fa'atasi mai. Tulou ou ponao'o Samoa i le afio o Tupu ma E'e. Tulou ou Faleupolu. Tulou auauna a le Atua. Ou te fa'atalofa atu i le Paia ma le Mamalu o le aso.

E nga iwi o te motu, te tangata whenua. Tena koutou, tena koutou, tena koutou katoa.

Malo e lelei. Fakalofa lahi atu. Taloha ni. Ni sa bula vinaka. Mauri. Kia Orana.

Warm Pacific to delegates to the 17th Asian Parliamentarian's Meeting on Population and Development. Thank you for your warm welcome. I am humbled and honoured to be invited to address you at this important meeting.

Today I plan to contribute to the discussion by making four points about 'population and development' in the Island Nations of the Pacific.

The first point that I want to make is that the issues of 'population and development' need to be seen in the context of the wider discourse on development and globalisation. It is increasingly problematic to extract a single issue, such as 'population', and deal with it in isolation. In my view all 'development' issues are inter-related and need to be addressed in a comprehensive manner.

Let me illustrate that point by identifying the key 'development' issues in the Pacific. I will do this by presenting two 'snapshots' of the Pacific.

Snapshot number one. A survey of ten independent Pacific nations identified the following concerns facing the people of the Pacific:

Change of diet from fresh local food to processed, imported, Western food, resulting in health problems such as: diabetes, obesity, heart diseases and alcohol abuse.

Change to a cash economy, from subsistence gardening and fishing, with a consequent need to export products and labour to earn cash, resulting in dependence on single crops and economic vulnerability.

Movement of population from outer islands and rural villages to urban centres and Pacific Rim cities, creating rural depopulation and urban overcrowding.

Lack of the development of a sustainable economic base, in newly independent island nations following decolonisation, with subsequent dependence on foreign aid and remittances to fund basic services.

Loss of traditional values and leadership, and the change of roles of men
and women, due to economic changes, with the subsequent breakdown of families and communities.

Loss of quality of the environment due to the disturbance of the fragile ecosystem by housing, power generation, logging and other extractive industries. Rising sea level, caused by climate change, resulting in the loss of land from coral atolls and low-lying coastal areas.

Dumping of poor quality imported products and hazardous waste from industrialised nations, creating unsafe marketplaces and environmental dangers.

Fragmentation of cultures and customs, and loss of languages under pressure from the international marketplace.

Change from a traditional, village-based communal lifestyle to a modern, urban, Western style of consumerism and individualism.

Uneven sharing of wealth and benefits from development with the benefits going to a small local elite or overseas, whilst the problems remain at home and the people at the grassroots suffer. (Laban and Swain 1996: 8)

In addition to these points, there has been an increase in political instability and ethnic tension across Melanesia. Some commentators talk of an 'arc of instability' stretching from East Timor, through West Papua, across the Solomon Islands to Fiji.

These concerns I have identified, facing the people of the Pacific, are hard to separate from each other. For example, the trend away from subsistence agriculture is linked to migration from village to town, which is linked to change diet and change in health status and to the change in roles of men and women and to changes in lifestyle.

My first point is that 'population and development' must be viewed in the context of the wider discourse on development and globalisation. De-linking these issues is problematic in my view.

My second point is that we need to view Pacific Island nations country-by-country rather than as a region - 'The Pacific'.

My second 'snapshot' is of the Pacific Human Development Report 1999, prepared by UNDP which illustrates the diversity of Pacific Island nations.

The Human Development Index for Pacific Island Countries 1998, illustrates this point. Palau, the Cook Islands and Niue rank amongst 'developed' nations whereas Papua New Guinea, the Solomon Islands and Vanuatu rank amongst 'least developed' nations.

This point is seen in sharper relief when we consider the Human Poverty Index, which rank Papua New Guinea and the Solomon Islands alongside Mali and Burundi and Niue and Tonga alongside Chile and Singapore.

Whilst these illustrations of diversity are dramatic we must also treat them with caution as the data upon which they are based are problematic at best. This brings me to my third point.

Few developing nations have reliable sources of information to base development planning upon. The Pacific Human Development Report for Pacific Island Countries 1999 makes this clear and spells out the difficulties of data gathering and the reservations that must be placed on any conclusions. Furthermore, measures of the state of 'development' of a nation are moving from the simple economic measures of GDP and GNP to more complex measures of Human Development and Human Poverty Indicies require more sophisticated data gathering and analysis.

My fourth and final point is that the development of Pacific nations has been driven by ideas and experts

from outside of the region, whilst the participation and involvement of citizens, outside of state agencies and marketplace organisations, has largely been neglected.

The aspirations of ordinary people, their families and communities, have not been considered of great importance in the 'development project'. The view that local communities have little to contribute to development, and are not involved in the global community, is contested by Pacific islanders. Epeli Hau'ofa suggests that "academic and consultancy experts tend to overlook or misinterpret grassroots activities because they do not fit with prevailing views about the nature of society and its development".

The contribution of local Pacific Island communities and their participation in their own social and economic development is critical in my view.

Which brings me to my conclusions.

First, the issues of 'population and development' need to be seen in the context of the wider discourse on development and globalisation.

Second, Pacific Island nations should be viewed country-by-country rather than as 'The Pacific'.

Third, any plans and programmes that address the issue of 'population and development' in the Island Nations of the Pacific must based on sophisticated, well designed and reliable research findings.

Finally, the participation of indigenous people, on their own terms, is central to good development policy and practice.

From my work, in New Zealand and in many Pacific Island nations, I have learnt that equitable and sustainable economic and social development is a product of many things. Good education, effective health and core public services, good and open government, environmental sustainability, high rates of saving and investment, a dynamic private sector, a vibrant civil society, a healthy trading regime, fair and just work places, an equitable tax regime and safe communities are all required. 'Population and development' strategies are but one part of comprehensive development initiatives to improve the quality of life of Pacific peoples.

I would like to conclude my paper by reflecting on the theme of your conference: "Sustainable Development for the future of Humankind".

To illuminate this theme let me relate to you a story of the impact of globalisation on one of our smallest island nations - Tuvalu.

Some of my ancestors came from Tuvalu, a small and beautiful nation located in the central Pacific. Tuvalu is comprised of nine coral atolls, the highest point of land is three metres above sea level at low tide. Yet our people have lived on those islands for over a thousand years.

When I visit my family on the island of Nukulaelae I see first-hand the effects of global climate change. A sea wall has been built around the island to stop erosion, salt-water is contaminating my family's pulaka pits, which grow our major foodstuff, and during high tides the sea can cover much of the land. Rising sea levels due to global climate is effecting my family on Nukulaelae and many communities throughout the Pacific. If the current rate of sea rise continues, by the middle of this century, the nation of Tuvalu will not exist.

Global climate change is the product of over consumption of fossil fuels in industrialised nations. Too many cars, poorly controlled factories and the smoke from coal and oil fires are slowly polluting the atmosphere which creates a "green house effect" which is heating up the atmosphere, melting the polar ice caps and causing the oceans to warm and expand. Consequently low-lying lands are being flooded. North

Americans are responsible for over 25% of the increase in atmospheric pollution which directly contributes to climate change and sea level rise.

Global climate change shows that the people in Tuvalu and other small Pacific Island nations are connected to the people in North America. Over consumption of fossil fuels in North America has a global impact.

The term globalisation describes a world where we are all connected by trade and telecommunications but it also describes a world where what we do has an impact on others often thousands of miles from us.

Globalisation means that we cannot do things in isolation from others. Globalisation means that every nation must practice sustainable development for the future of humankind.

During this seminar I hope that we will considerable thought into planning ways we can ensure our communities, families and children are protected in a globalised world. Good luck on your ongoing discussions on these important issues facing our people in the Island Nations of the Pacific and our sisters and brothers throughout Asia.

Ia manuia lava. Soifua.

Session I

"Carrying Capacity in Asia and the Pacific"

—Focus on Food and Water Resource—

Session 1

Chairperson:
Mr. Zhang Huaixi, MP (China)

"Carrying Capacity of Asia as Influenced by Environmental Resources"

Dr. Uchijima Zembei
President
Miyazaki Municipal University

1. Agriculture as the fundamental basis for survival of human beings

The 6.0 billion people are living on the Earth, utilizing two kinds of energy: one is the food energy and other the fossil fuel energy. The food energy is the fresh solar energy because crops are converting a part of present solar energy into foods. On the other hand, the energy in petrolium, coal, and natural gas is the fossil solar energy, because these energy was provided through the photosyn-thetic activity of primitive plants during the geological age. As well known, the fresh solar energy within foods is the fundamental energy for the survival of human beings as living things. The fossil solar energy is mainly used to develop and maintain the highly civilized human society.

Food energy is provided with agriculture, animal husbandly, and fishery. Among them agriculture is playing the most important role in supporting the life of human beings. Agriculture is the most oldest industry in the world, because it has initiated 10 to 8 thousand years ago. Since then, many people have concented their effort to increase and stabilize food production in each district of the world. Particularly, the 2nd Industrial Revolution initiated from the half of the 20th century has resulted in the drastic change in agriculture in the world. Namely, the agriculture has shifted from so-called old fashioned agriculture to high yielding agriculture by introducing many agrotechniques and pro-ducts developed in the industrial sector.

Figure 1 indicates secular changes in the human population, cereal production, and average temperature of the world during the past 150 years. As can be seen in this figure ,projected trends of the world human population and cereal production during the coming 50 years period are also depicted with that of the global mean air temperature estimated from global climate models (GCMs).

High yielding agriculture assisted by well developed science and technology has succeeded to increase the world cereal production at a so rapid speed as shown in Fig.1. Namely, the world cereal production increased practically linearly from 0.6 billion ton in the 1950 year to 2.0 billion ton in the 1990s,in-dicating that the average increasing rate of cereal production was 28 million ton / y. Although the world population increased from 2.5 billion people in the 1950 r to 6.0 billion people in the 2000, the per capita production in- creased proportionally from 250 kg / y to 360 kg / y during this period, improving the nutrition level of people, particularly in the developed countries.

The modern high yielding agriculture has been established and operated by using simultaneously the following four resources, in sets, at need, and relatively low cost:

a. environmental resources (soil, water, solar radiation, air, weather, wind etc)

b. biological resources (high yielding improved crops and domestic animals)

c. technological resources (effective fertilizers and chemicals, efficient agromachines, useful

integrated systems for agrotechnological services)

d. energy resources (fossil energy, atomic energy)

The distinct achievement in cereal production during the later half of the 20th century is thought to be because of the two facts: one is the introduction of high yielding agriculture and other the relatively stable world climate during this period. As shown in Fig.1, the world climate for this period was stable, compared with climates before and after this period. It is reasonable to think that the relatively stable world climate contributed partly to the rapid increase in the world cereal production achieved during the second half of the 20-th century.

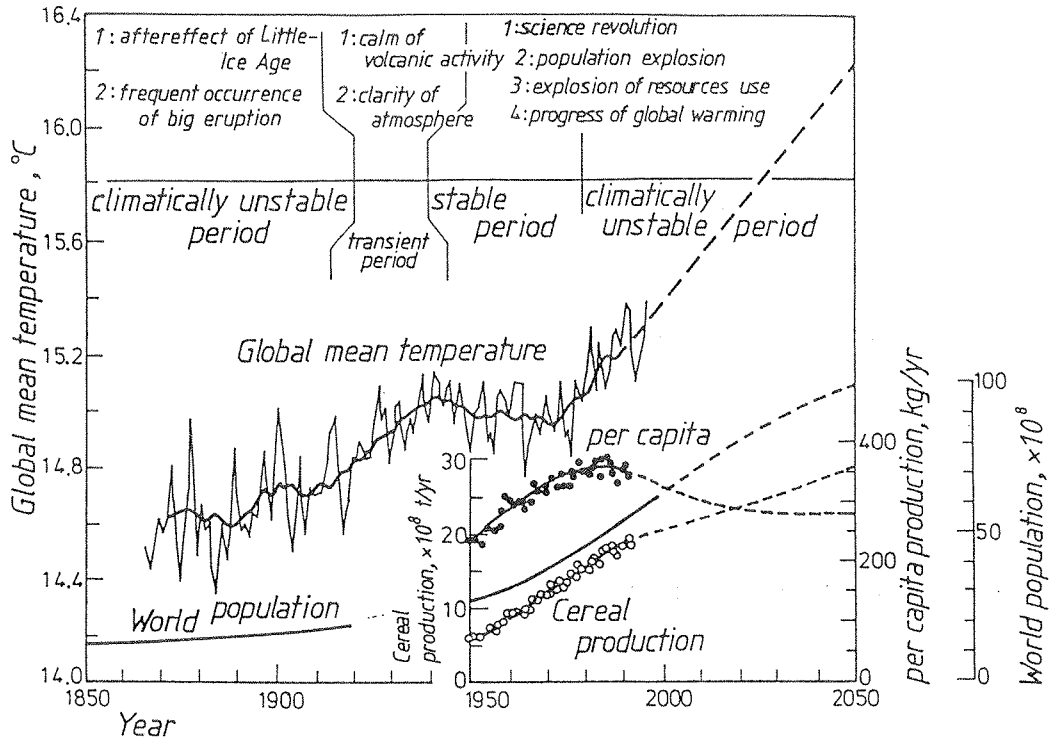


Fig.1. Secular changes in global climate, world population and world cereal production during the period 1850 to 2050.

However, as shown in Fig.1, specialists of the world food problem (e.g., Kendall and Pimentel, 1994) expect that the increase in world cereal production will be weakened in the 21st century mainly due to environmental constraints such as global warming, shortage of water resources, degradation of cultivated fields, and slowdown of development speed of high yielding agrotechnology. Figure 1 shows that the slowdown in increasing speed of world cereal production will result in the decrease of the per capita cereal production and consequently the decline of nutrition level of people, particularly of developing countries.

Figure 2 indicates the drastic increase in the annual production of rice, wheat, and corn (maize) in Asia. Rice, wheat, and corn(maize) are important staple food for Asian people. The rapid increase in the annual production of these crops, as well known, has resulted from the introduction of high yielding agriculture into Asian countries. The rapid increase of crop production due to the introduction of high yielding agrotechnology into many developing countries was an epoch making event in the world history of agriculture, and is well known as the green revolution. The green revolution, though it was temporary, has fairly improved the balance of demand and supply of foods in Asia. By using the production data in Fig.2, the average increasing rates of those three crops over the period 1960 to 1999, respectively, were estimated as follows:

Rice	5.689 Mt / y
Wheat	4.417 Mt / y
Corn	3.333 Mt / y

Since the cultivation areas of these crops have been maintained at nearly constant levels during the period 1960 to 1999, the rapid increase in annual production of these crops is thought to be mainly because of the rapid increase in yield of these crops.

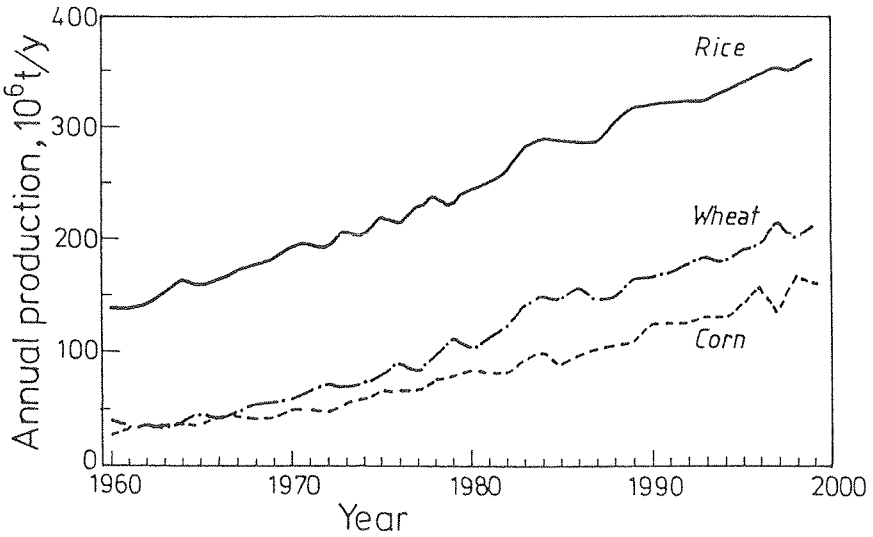


Fig.2. Secular changes of annual production of rice, wheat, and corn in Asia.

Although the high yielding agriculture well supported by modern industrial products is expected to bring about higher production independently of times and regions, as crop production data indicate clearly, the crop production is still sensitive or vulnerable to fluctuation and change in environmental conditions, particularly climatic conditions. Furthermore, the unimpeded growth in the world population, excessive urbanization and expanding industrialization are posing an severe threat to the survival of human beings and other living things on the Earth.

In order to mitigate and/or solve the anthropogenic threat and to make sustanable symbiosis among whole living things, it is needed to make clear the upper limit of human population that could survive using natural resources in a given region and/or country, without giving any disturbance on regional and global environments. This upper limit of human population means the human-carrying capacity of a given region and / or country.

2. Phytoclimatic characteristics of Asia

Asia, the largest continent in the world, has an area of 46.614 million k m^2 and a population (3.8 billion people) of 63 % of the world population. From a climatic point of view the land of Asia is considerably different. Since Koppen (1931) adopted climatic elements such as mean annual temperature, mean annual precipitation, and seasonal variations of these as predictable variables for the classification of major phytoclimatic zones, many studies have been made to describe the geographical distribution of phytoclimates on the Earth. Since then many climatic indexes have been studied and used to characterize a phytoclimatic difference among regions.

In this report, the following radiative dry index (RDI) is used

$$RDI = R_n / l r \qquad (1)$$

where R_n is the mean annual net radiation at surface under actual conditions,

r is the mean annual precipitation,
l is the latent heat of vaporization for water.

Table 1 shows characteristics of phytoclimatic zones in relation with values of RDI. In areas with RDIs between 0 and 2,energy supply counterbalances to rainfall, allowing vigorous development of natural vegetation with higher productivity (NPP, t dry matter/(ha y)). In general, high yielding agriculture has been conducted in areas with RDIs between 0 and 2, and with sufficient solar radiation. With increasing RDI energy supply becomes gradually excessive and rainfall becomes deficient, resulting in the decline of natural vegetation. In areas having RDIs between 2 and 7 natural vegetation is very scarce and its productivity is limited due to the shortage of water resources.

Table 1 Characteristics of phytoclimatic zones

RDI	climatic feature	Vegetation productivity		annual evapo-transpiration, mm
0～2	very humid～sub-humid	lower insolation	lower	200-400
2～7	sub-humid ～ sub-acid	higher insolation	higher	1000-1500
7～10	sub-acid～arid (desert marginal)	lower and unstable (dry farming)		1500-2000
>10	true desert	extremely low and / or zero		>2000

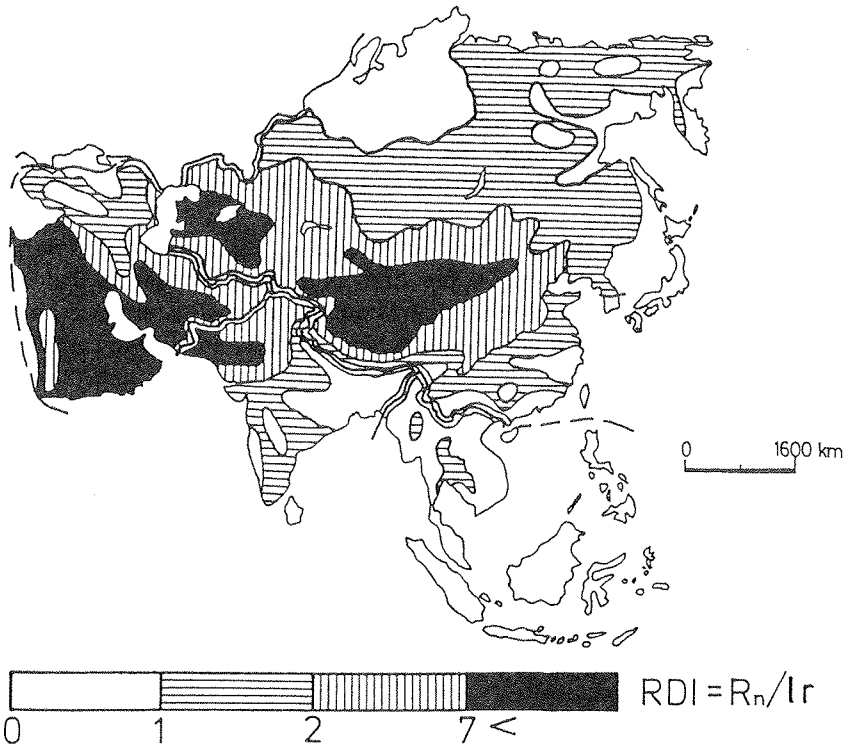


Fig.3. Geographical distribution of radiative dry index (RDI) on Asia.

Figure 3 gives a simplified geographical distribution of RDI in Asia (after Hare,1970). It is clear that the humid and sub-humid regions (RDI < 2) in Asia include the Siberia, Northeast district of Asia, Southeast Asia, and Indian subcontinent. On the other hand, semi-arid regions having RDIs between 2 and 7, and

desert margin and true desert regions having RDIs over 7 are mainly located in West Asia and Central plateaux butressed by ranges of mountains. In that regions natural vegetation is quite poor due to unfavorable climatic conditions, that is ,excessive solar radiation, few rainfall, extremely large annual and diurnal range of temperature etc. As Table 1 indicates, the annual potential evapotranspiration in such regions is more than 1500 mm, implying that much water supply is needed to conduct irrigation agriculture.

The following percentage distribution of lands with different RDIs is obtained from data analysis of Fig.3. This result indicates evidently that the land area

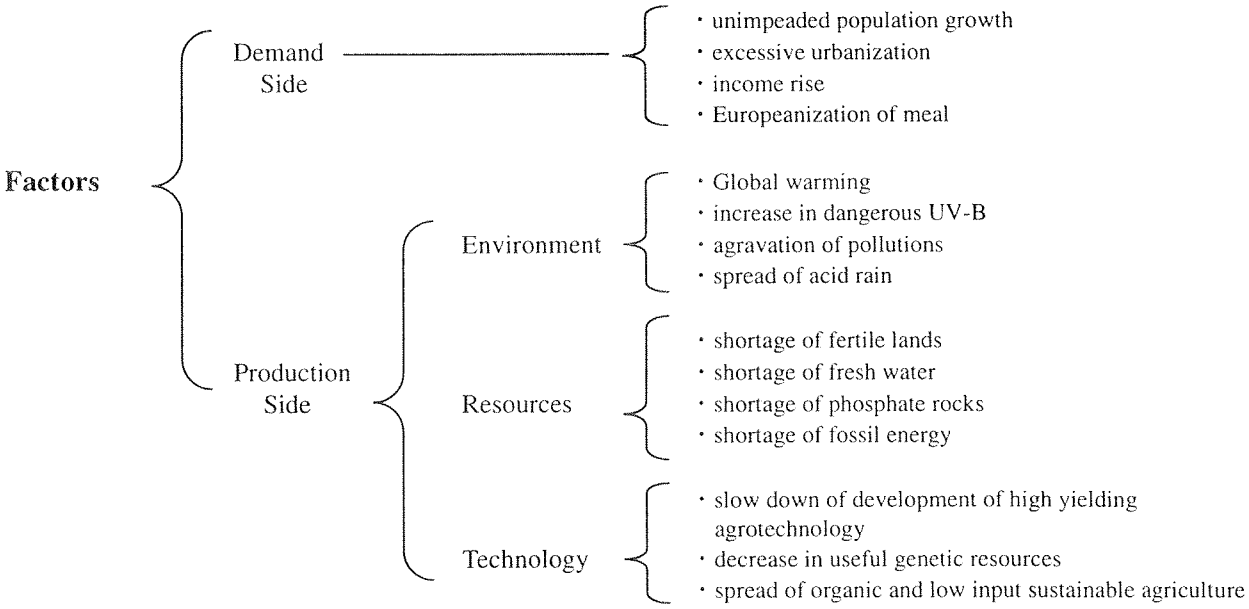
RDI	0 – 1	1 – 2	2 – 5	5 – 10	> 10
Area %	25.3	25.4	19.4	22.9	7.0

with phytoclimatic conditions suitable to the development of natural vegetation and consequently agriculture is about 50 pecent of the whole land area (46.614 million km2) of Asia. Particularly, the land area with climatic conditions (0 < RDI <1) fitted for the rain fed cultivation of rice plants is only 25.3 percent of the whole land area. Therefore the development of water resources should become the most important and urgent problem for spreading irrigation-agriculture toward sub-humid and semi-arid regions..

3. Supply-demand relation of foods and carrying capacity

The carrying capacity of human beings is closely related to the supply-demand relation of foods in a given region. Table 2 shows the factors influencing the supply-demand relation of foods. In the demand side, the population growth and income rise are expected to play an important role in the increase off ood consumption. In the production (supply) side, the combination of environment, resources, and technology could affect the production of foods in given regions.

Table 2 Factors influencing supply-demand relation of foods



Namely the food production should be influenced positively or negatively by the good or bad combination of factors in the production side. If the bad combination of these factors resulted from uncontrolled growth of world population and global economy, the global ecosystems, on which whole living things on the Earth depend closely, should face a crisis.

As described above, the carrying capacity of human beings in a given region depends closely on many factors including natural resources and social conditions. Among them, the amount of cereals produced in a

given region is the most important determinate for the carrying capacity. Therefore, under conditions that any foods are not imported from other regions, the human-carrying capacity (C, people) of a given region can be expressed as follows:

$$C = \Sigma \; A_i \; Y_i \; / \; \Sigma \; e_i \qquad (2)$$

where A_i and Y_i denote,respectively,the cultivation area(ha) and the average yield (t / ha) of the i-th crop, e_i is the per capita annual consumption(t/capita) of the i-th crop. Equation (2) indicates clearly that the human-carrying capacity is strongly influenced by the following three elements:

a. landuse pattern (A_i)
b. climate and level of agrotechnology (Y_i)
c. living standard (e_i)

1) Change in landuse pattern influencing area of arable lands

Human beings are intensively using land resources for the following purposes:

a. providing food, fiber, and others
b. harvesting timber, and firewood 1)
c. locating residential districts
d. locating factory districts
e. constructing transportation systems.

Since the total land area of a given region is constant independently of time, with the increase in population density in particular region, forest lands and / or natural grasslands are converted first into arable lands, then as development proceeds a portion of the arable lands is used for residential and other purposes. Therefore, it is reasonable to assume that the percentage of forest and / or natural grasslands decreases monotonically with increasing the population density. On the other hand, the dependence of the percentage of arable lands on the population density can be characterized by a curve with a peak in an intermediate range of the population density (Uchijima, 2001; Uchijima and Ohta, 2000).

Figure 4 is a schematic graph showing changes in percentages of forest, arable, and urbanized lands with population density in wet and warm climatic zones.

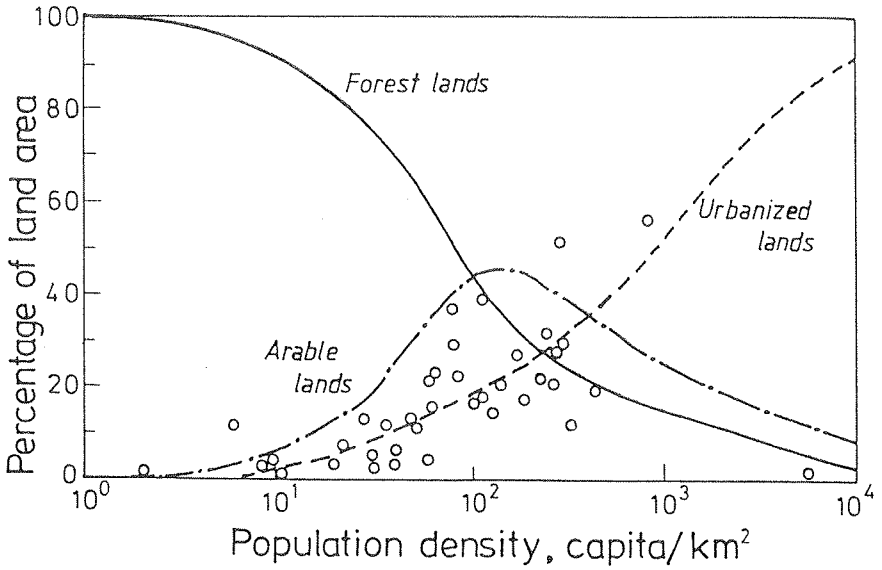


Fig.4. Schematic graph showing change in land use pattern with population desnsity.
Circles in Fig.4 denote the percentage of arable lands for the individual countries in Asia (FAO,1998).

Fairly large scatter of points indicates that changes in land use pattern is influenced not only by the population density but also by other factors such as topography, climate, and industrialization. The following relation is obtained to relate the percentage of forest area (r f, %) with population density (p, capita / km^2) and phytoclimatic conditions (Uchijima and Ohta,2000) where RDI is the average value of RDI on a given region.

$$r_f = 100 \exp [- \{0.018 RDI + (p / 100)^{0.54} \}] \qquad (3)$$

Equation (3) implies that the area of forests and consequently the land area available on the use of agriculture and forestation decreases with increasing the aridity of climate(RDI).
According to the FAO production year book (FAO, 1998), the area of arable lands (including the lands for permanent crops) in Asia is as follows:

$$5.58 \times 10^6 \quad km^2$$

This indicates that 17.5 percent of the whole land area of Asia is already used to produce foods, fibers, and others (in this calculation, the land area of Sibera of Russia is excepted). As already discussed in the foregoing part of this paper, since the land area with phytoclimatic conditions suitable for the agriculture is only half of the whole land area of Asia, it seems reasonable to expect that roughly one-third of the land area suitable for the development of natural vegetation and consequently of the food production has been already converted into arable lands during human history, destroying the valuable terrestrial ecosystem in Asia. In order to solve the food problem to be caused by the increase in the population of Asia during the 21st century, more lands should be exploited. However, there are difficulties in finding new land that could be exploited for agricultural production. This is because most of the unexploited land up to the present is either too dry, too wet, or too cold for agriculture, and the productivity of this new land would be much lower than present levels inland now being cropped.

2) Climate influencing crop yield

Although the high yielding agriculture has succeeded to increase crop yields in the world, the food production is currently limited by fluctuation and / or change in climate. The important climatic limit in the world is insufficient rainfall, severe cold, intensive tropical cyclone and so on. Particularly, insufficient rainfall during the growing period of crops has caused frequently droughts and given severe impacts on regional human society.

On the other hand, the continuous increase in the concentration of greenhouse gases (CO2, CH4, N2O, CFCs etc.) is now thought to alter the global climate. Although there are important differences between the GCMs (Global Climate Model or General Circulation Model),the model experiments project that the global mean surface temperatures will rise between 2.0 and 4.5 ℃ by the end of the 21st century (see Fig.5), that warming will be greater in the winter half of the year than in the summer, and that warming will also be greater at higher than at lower latitudes.

Furthermore, the models project that rates of evaporation and transpiration will increase due to higher surface temperatures, and that convective precipitation with localized intense rainstorms will increase than supersaturated precipitation with uniform rain distribution. Therefore, it is expected that the efficiency of use of stream flow will decrease in many regions, particularly in sub-humid and sub-arid regions.

Another important consequence due to global warming is a sea-level rise, because coastal zones and islands are very vulnerable to the sea-level rise. The models projected a sea-level rise of 0.14 to 0.8 meters for 1990 to 2100, with a central value of 0.47 meters. Since coastal zones in Asia are important producing areas of rice that is staple food for many Asian people and densely populated, the projected sea-level rise, though it seems to be not so dangerous, is expected to cause severe damages to the agricultural production and consequently the society in these zones.

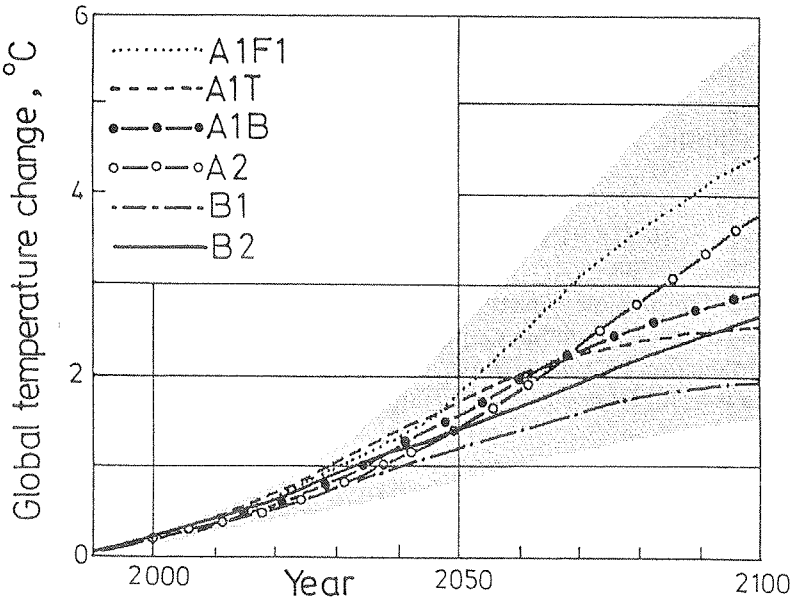


Fig.5. Projected global mean surface temperature changes for six emission scenarios (Source,IPCC,2001).

Global warming is expected to cause not only changes in mean climate, but also changes in the frequency of extreme weather events (such as severe storms, heat waves, severe droughts and damaging frosts). As the history of famines in the world shows clearly, these extreme weather events have been a major threat on agricultural production in the world. In general the relationship between mean climate and the frequency of extreme weather events is non-linear. Therefore, the global warming can induce the significant changes in the frequency of extremes. That is, intensive storm, heat wave, summer drought, tropical cyclone, and so on may become more frequent and give much damages on food production in the 21st century (e.g., Parry, 1990; Rosenzweig and Hillel, 1995; Uchijima, 1993). However, much more work on this issue is needed before we can estimate the effect of expected extreme weather events on agriculture.

3) Carrying capacity of Asia

Assuming a continuation of present trends of the population growth and cereal production, and per capita cereal consumption of Asia, we estimate the human-carrying capacity of Asia for the first half of the 21st century. At first the population growth is assumed to follow the UN-medium projection (UN-Population and Vital Statistics, 1998) leading to about 5.27 billion people by 2050. Next the production data of cereals in Asia (Ito, 2001) were used to project the trend of cereal production for the same period. Figure 6 indicates the cereal production during the period 1960 to 1999 with the secular change in the Asian population. The cereal production data in Fig.6 were substituted into Eq.(4) to project the future cereal production of Asia.

$$P_x = P_{99} + (F \times R \times n) \qquad (4)$$

where P_{60}, P_{99}, and P_x are the whole cereal production in 1960, 1999, and X-year, respectively,

R [$= (P_{99} - P_{60}) / 39$] is the average growth rate of cereal production over the period 1960 to 1999,
n is the number of years from 1999 to X-year,
F denotes a coefficient (0.0 to 1.0) characterizing overall effects of environmental changes and agrotechnologies on the cereal production.

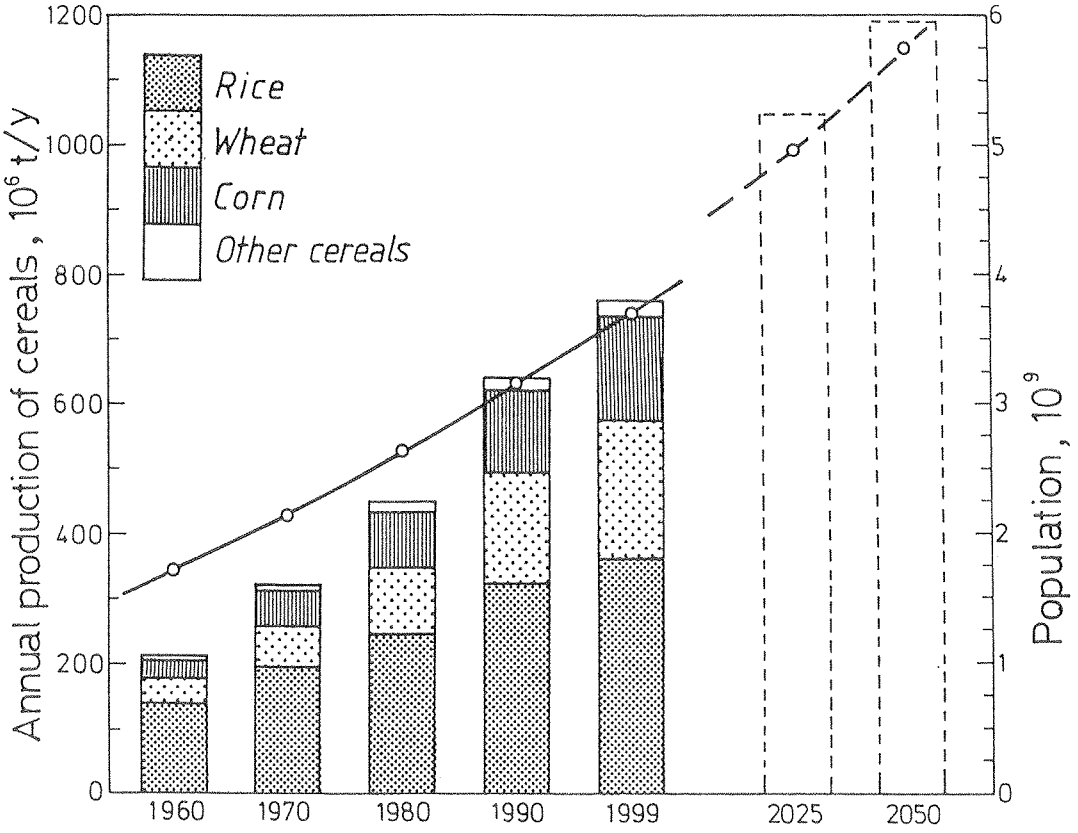


Fig.6. Secular changes and projections of cereal production and population of Asia.

As Eq. (2) indicates, it is needed to project the trend of per capita annual consumption ($E_x = \Sigma\ e_i$) during the period to the year 2050. The data of population and cereal production of Asia for the period 1960 to 1999 were used to calculate the secular change in per capita consumption of whole cereals and its projection. Figure 7 gives the secular change(thick solid line with circle) and the projection(long-dashed line) so obtained.

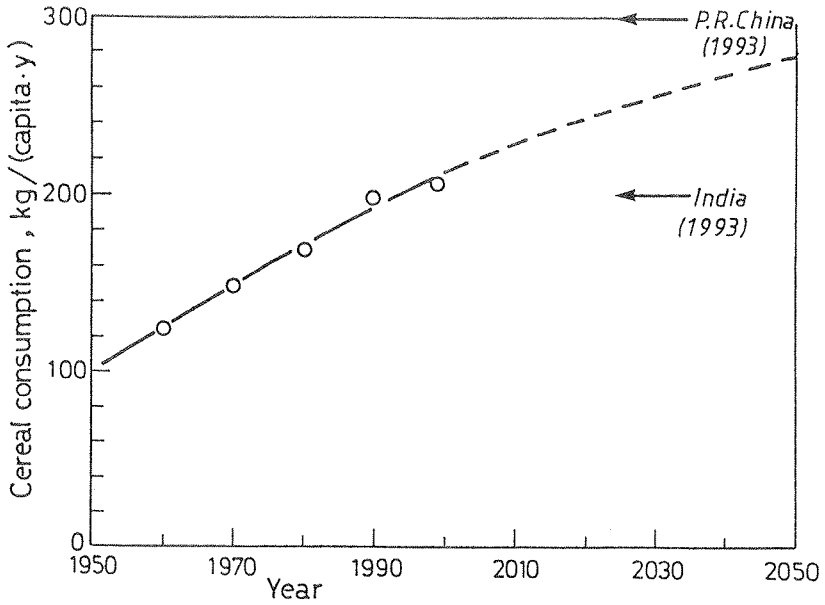


Fig.7. Secular change and projection of cereal consumption (average) in Asia.

By substituting values of P_x and E_x into Eq. (2), we can estimate approximately the human-carrying

capacity of Asia over the next 50 years. The results so obtained are shown in Table 3, with the Asian population projected by UN (1998). In this table, F = 1.0 means that present trends, patterns, and activities relating to the cereal production of Asia assume to continue over the next 50 years. F-values less than 1.0 implies that the growth rate of cereal production will decrease due to possible consequence of climatic changes, degradation of soil, shortage of water resources, ground-level ultraviolet radiation increase, and so on. For example, Kendall and Pimentel (1994) has assumed that the average growth rate of global cereal production over the next 50 years will reduce to about half of that (33.6 Mt/y) over the period 1950 to 1990. Using the growth rate so assumed, they studied the demand and production relation of food in the world over the next 50 years.

As shown in Table 3, the human-carrying capacity projected on the basis of production and consumption of cereals is lower than the UN-projected Asian population. Particularly, the gap between the UN-projection and our projection becomes gradually large due to the proportional decrease in cereal production with the reduction of F-values.

Table 3 Estimated carrying capacity of Asia

	2025		2050	
UN population & vital statistics (1998)	47.2×10^8 people		52.7×10^8 people	
Projection of cereal production	$P_x = P_{99} (F \times R \times \Delta t)$, t / y			
Average cereal consumption	250 kg / (capita·y)		275 kg / (capita·y)	
F	$P_{25} \times 10^8$ t/y	$C_{25} \times 10^8$ people	$P_{50} \times 10^8$ t/y	$C_{50} \times 10^8$ people
1.0	10.844	43.38	14.229	51.74
0.9	10.493	41.97	13.541	49.24
0.8	10.140	40.56	12.847	46.72
0.7	9.759	39.04	12.159	44.21

Since the estimate of F-values depends on many factors most of which are uncertain, it is not so easy to make useful and accurate forecasts. However it is expected that the growth rate of Asian cereal production in the 21st century will become less than 1.0 mainly due to shortages of natural resources and irreversible environmental degradation to be caused by unimpeded population growth and excess urbanization in this continent. Table 3 indicates evidently that the Asian population over the next 50 years is getting close to its limited to be determined by present agrotechnologies and natural resources. Although a part of the food deficit expected from the cereal production and population in Table 3 could be met with the production of tuber crop (potato, sweet potato, taro and cassava etc.) and podded crops (beabs, soy bean etc.), it is reasonable to conclude that the Asian population projected by the UN (1998) over the next 50 years will exceed its human-carrying capacity estimated from the supply and demand relation of foods, that is from its food production capacity.

The following four means are thought to solve the gap between the UN-projection of Asian population and our projection of Asian human-carrying capacity, and to supply enough foods to Asian people.

a: control of unimpeded growth of population ,
b: control of food consumption increase with income rise,
c: import of foods through international trade systems,
d: increase in food, particularly cereals production.

The first two (a and b) are unfeasible as a solution to feed Asian people, because these are expected to face

to great social resistance. If world food production increases smoothly over the next 50 years even though adverse effects of global climate changes are expected, Asian countries could import enough foods from major crop exporting countries such as USA, Brazil, Australia etc. through international trade systems. However many countries in Asia are classified into so-called developing country and thus their capability of food importation may be quite beyond their need. Therefore the import of foods from other countries is not thought to be a major mean for the solution of the projected gap between supply and demand of foods In Asia over the next 50 years. The most feasible mean to solve the projected gap between supply and demand of food in Asia may be the increase in cereal production (d).

This man would require the more expansion of arable lands and greater efforts for increasing crop yield. Although some studies suggest that there may be much potentially available land in Asia, converting it to crop fields would be costly in energy input and expected environment impacts. Furthermore, crop yields of newly expanded crop fields should be considerably low compared with those of existing cropland. The above two facts are thought to limit realistically the more expansion of croplands. Intensification of production through double- or triple cropping and growth I yields of cops on existing cropland should contribute to solve the gap between the UN-population projection and our projection based o supply and demand of foods of Asia over the next 50 years.

If these attempts were made successfully, excessive human appropriation of lands, fresh water, and other natural resources would give irreversible damages on terrestrial and coastal ecosystems on which human beings and many wild lives depend closely. For example, Vitousek et al. (1986) estimated that humans now appropriate nearly 40% of the potential terrestrial productivity, and Uchijima (1993) reported that humans are now harvesting 25% of the actual terrestrial productivity for only human use. The excessive human appropriation of the terrestrial productivity as mentioned above is attended with the overuse of land-, water- and biological resources of each district, resulting in the irreversible degradation of regional environment and regional natural resources. These would bring about human-caused large-scale extinctions of species.

Therefore, problems of supply-demand relation of foods and consequently human-carrying capacity would require highly organized global and regional effort by both the developed and the developing countries as pointed out by Kendall and Pimentel (1994).

In these effort, the study and development of super-high yielding agrotechnologies, by which crop yields much higher than the present level would be produced without causing any degradation and / or pollution of foods and surrounding environments, should have priority both regionally and globally.

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"Carrying Capacity in Asia and the Pacific with Focus on Food and Water Resources : Case Study of Sri Lanka"

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Historically, Sri Lankan civilizations flourished with the development of water resources. Historians have described the early Sri Lankan societies as "hydraulic civilizations". Unlike most ancient civilizations that grew around fertile river basins, the Sri Lankan hydraulic societies were dependent on reservoir systems. The numerous ancient tanks of different sizes and shapes that still exist bear testimony to the growth and development of irrigated agriculture in ancient Sri Lanka. Indeed, the capital cities of the north western province namely Anuradhapura and Polonnaruwa for centuries sustained a remarkable agricultural development and the kings who ruled these cities have left behind evidence of a glorious agrarian civilization based on irrigation. Subsequently, with the destruction of these civilizations and the gradual movement of population to the central and southern regions of the country resulted in the development of river based agriculture.

Population Growth

Various estimates of population of Sri Lanka in ancient times have been made based on food production and irrigation works and some estimates are larger than the present size of population of the country. However, these estimates have been rendered suspect due to the absence of any reliable scientific evidence. The first enumeration of population of Sri Lanka was undertaken in 1789 during the period of Dutch occupation of the country. Although the census was conducted only in the maritime provinces, it was commonly believed that the population of the country as a whole was around 2 million. The first scientific census of population of the country was undertaken during the British period in 1871 where the total population was enumerated at 2.4 million. The census of population carried out in 1953 after gaining independence from the British in 1948, recorded a population of 8.1 million. The estimated population for the year 2001 is 19.4 million. Table 1 gives the growth of population of Sri Lanka since 1871.

TABLE 1
GROWTH OF POPULATION, 1871-2001

Year	Population (000')	Average Annual Growth Rate (%)	Density (per Sq.Km)
1871	2,400	-	37
1881	2,760	1.4	43
1891	3,008	0.9	46
1901	3,566	1.7	55
1911	4,106	1.4	63
1921	4,498	0.9	69
1931	5,307	1.7	82
1946	6,657	1.5	103
1953	8,098	2.8	125
1963	10,582	2.7	164
1971	12,690	2.2	196
1981	14,847	1.7	230
1991*	17,247	1.5	267
2001*	19,370	1.2	300

Sources: Censuses of Population and estimates of the Author *Estimated

Since the first census of population taken in 1871, the population of the country has doubled three times. It is evident from Table 1 that average annual rate of growth of population during the periods between 1871 and 1946 have remained below 2 per cent, and for the period as a whole averaged around 1.4 per cent. However, during the period 1946 to 1963, the growth rate averaged around 2.8 per cent. In the subsequent periods, the growth rate of population has gradually declined. The absolute size of population has increased by 8 time between 1871 and 2001 and as such the density of population of the country has also increased from 37 persons per square kilometer to 300 during the same period.

Water Resource Availability and Development

Rainfall provides almost all surface and ground water in Sri Lanka. The mean annual rainfall of the country is around 2,000 mm which is distributed over a surface area of 65,610 square kilometers. The rain gives an average volume of 131,230 million cubic meters of fresh water. It is estimated that about 31 per cent of it goes as river flow and the balance is used and transpired by crops and natural vegetation or evaporated from the soil directly. (NARESA, 1991).

Rainfall divides the country into wet and dry zones. The wet zone which comprises the south west and central hill country averages 2,500 mm of rainfall. The remaining two thirds of the country which is the dry zone comprising the north and southeast is dry and receives on an average of 1,500 mm of rainfall. The wet zone has only 23 per cent of the land area of the country but contains 57 per cent of its population.

The annual rainfall is distributed over two main agricultural seasons, the wet and dry seasons. The wet season or North-East monsoonal rainfall occurs generally from December to February while the dry season rainfall or the South West monsoonal rainfall takes place from May to September. The rainfall of North-East monsoonal period benefits a larger part of the country.

Sri Lanka has 103 distinct river basins. Most of the main rivers originate from the hill-country and passes through lowlands and flow into the sea. About 35 per cent of the total annual run off is utilized for irrigation and hydropower projects. However, in the dry zone over 50 per cent of the runoff is utilized. Sri Lanka's agricultural needs are mainly met by surface-water resources. In the dry zone water collected in numerous surface water reservoirs is generally used for cultivation and for domestic purposes throughout the year.

During the past few decades, there have been many instances where the monsoonal rains have failed and resulted in prolong droughts. In addition, the demand for water has increased due to population increase resulting in greater use of fresh water for agriculture, industry and for domestic use. As a result, exploitation of ground water started in the mid 1950s. Groundwater is extracted from shallow dug wells as well as deep tube wells. In the dry zone, extensive ground water utilization is seen. Groundwater availability is about 15 per cent of the island's surface water resources.

During the past five decades, the population of the country has increased by 2.5 times and agricultural production by five fold. Manufacturing output of industrial production has increased during the past two decades by 15 times. As a result, demand for water resources were increasing at a rapid rate. The conventional systems of water availability were no longer adequate to meet the increasing demands. Therefore, in 1978 the government of Sri Lanka launched the "Accelerated Mahaweli Development Programme" to divert the largest river in the country namely the Mahaweli Ganga to the dry zone. The project development area covered about 38 per cent of the total land area of the country. It was estimated that the annual average discharge of Mahaweli waters into the sea was 11,061 million m^3 which is about 21 per cent of the total discharge of all river basins of the country. The plan envisaged to harness 5800 million m^3 of annual Mahaweli Ganga flow for agricultural activity of a land area of 364,000 h.a. in the dry zone. Of this, about 100,000 h.a. of existing land already irrigated by tanks and reservoirs but are water deficient and the balance 246,000 h.a. of new land of which some were rain fed. The Mahaweli Ganga Project also installed hydro-power plants with a total capacity of over 500 MW for the production of electrical energy.

Utilization of Water Resources

The utilization of water resources in a country depends not only on minimum needs and availability of water but also on the level of economic development and the extent of urbanization. The three major sectors that use water resources are agriculture, industry and the domestic sector. Globally, agriculture accounts for 69 per cent of all annual water withdrawals; industry about 23 per cent and domestic use about 8 per cent (Population Reports, 1998). These proportions differ from country to country. Developing countries use most of their water supplies for agriculture. For instance, India uses 90 per cent of all water for agricultural purposes, only 7 per cent for industry and 3 per cent for domestic use. It is likely that Sri Lanka's withdrawal of water by sector is similar to that of India given the similar nature of their agrarian systems. During the past century, the demand for freshwater has risen substantially as countries developed economically. Withdrawals of water have increased in all three major categories of use.

Agriculture

The monsoonal pattern of weather in Sri Lanka has encouraged the development of irrigated agriculture. The common system of irrigation in the wet zone is the flood irrigated paddy as in this area the rivers and steams are generally perennial and the rainfall is more or less evenly distributed. Thus paddy cultivation is mostly rain fed. In the dry zone however, the steam flows are not perennial and the rains occur during the north-east monsoonal season. Therefore, paddy cultivation is done by irrigation waters from reservoirs. It can be seen from Table 2 that the area of paddy land irrigated during past two decades has declined mainly due to shortage of water.

TABLE 2
Irrigated Paddy Lands, 1985-1997 (Hectars)

Year	Major Schemes	Minor Schemes
1985	392,824	190,250
1992	379,302	178,407
1997	369,708	143,674

Source: Department of Census and Statistics

In Sri Lanka during the past five decades, population increases have outpaced improvements in agricultural production. For instance, paddy output has increased from 463,000 metric tons during 1951-52 to 2.2 million metric tons during 1996-97. An almost five fold increase in output over a period of 45 years. However, Sri Lanka has not yet reached self sufficiency in rice. During this period more than 10 million people have been added to the country's population. It can be seen from Table 3 that despite the remarkable increase in paddy production, output per person has declined since the early 1980s.

TABLE 3
Growth of Paddy Output and Population, 1951-52 to 1996-97

Period	Paddy Output (000' metric tons)	Population (000')	Output per Person (metric tons)
1951-52	463	7,975	0.058
1960-61	901	10,032	0.090
1970-71	1,396	12,608	0.111
1980-81	2,229	14,740	0.151
1990-91	2,389	17,120	0.140
1996-97	2,239	18,442	0.121

Source: Department of Census and Statistics

Rice will continue to be the main staple diet of Sri Lankan population during the next three decades. On

the assumption of a per capita minimum daily calorie requirement of 2500 kilo calories per person and that 60 per cent of the calorie requirement will continue to be provided from rice, the paddy production requirements for the growing population are shown in Table 4. It can be seen that with slower population growth rates, there will be less pressure on water resources for the production of paddy.

TABLE 4
Paddy Output Required to meet Basic Caloric Requirements, 2001-2026

(000' metric tons)

Year	Projection A	Projection B
2001	4,465	4,532
2006	4,694	4,835
2016	5,109	5,528
2026	5,399	5,994

Source: A.T.P.L. Abeykoon, "Population Environment and Sustainable Development"(1993).op.cit.

Note: Projection A assumes replacement fertility by 2001
Projection B assumes constant fertility.

Industrial Use

Industry is water-intensive. In Sri Lanka, industrial development has increased during the past three decades with the establishment of several new industrial areas. The industrial water supply has not caused major problems as most of the industries that require large amounts of water have been located close to surface or ground water sources. In the Industrial Processing Zone complex of the Greater Colombo Development Area has been provided with tube wells yielding over half a million gallons of water per day. In the late 1960s, the State Industrial Corporations Act brought about a transformation in the industrial sector and investments in manufacturing activities. Under the provisions of this Act the National Salt, Paper, Mineral Sands and Steel Corporation were established. It is evident from Table 5 that manufacturing output has grown rapidly during the past two decades.

TABLE 5
Growth of Manufacturing Output, 1980-1999

Year	Production (Rs. Million)	Index of Change (1980=100)	% to the GDP
1980	11,048	100	17.7
1985	21,849	198	14.7
1990	43,264	392	14.5
1995	94,098	852	15.7
1999	163,103	1476	16.4

Source: Central Bank of Sri Lanka

Domestic Use

At the last Census of Population held in 1981, 21.5 per cent of the total population was living in urban areas and the balances including the plantation sector was rural. Currently, it is estimated that about 26 per cent of the population live in rural areas. About 70 per cent of the urban population is served with pipe-borne water. However, in the rural sector only about 15 per cent of the population have such facility. About 33 per cent of rural population excluding the estate sector obtain their water requirements from

protected wells within premises. Another 24 per cent obtain their requirements from projected wells outside the premises.

The demand for domestic water is expected to increase with increase in population and rising living standards. Falkenmark (1992) developed the concepts of water stress and water scarcity based on an index of per capita freshwater needs. She estimated a minimum need for household use of 100 liters per day per person. Using this index the domestic needs of freshwater for the future are given in Table 6.

TABLE 6
Domestic Needs of Freshwater, 2000-2020

Year	Fresh Water (million gallons)
2000	153,665
2005	161,695
2010	168,630
2015	174,105
2020	178,226

Consequences of Overuse and Pollution

With growing population and rising per capita consumption and pollution, freshwater resources will become scarce in the future. As more water is withdrawn, less remains to maintain the vital ecosystems on which humankind also depend. A significant portion of the total freshwater available in the hydrological cycle is needed to sustain natural ecosystems and millions of other species that they shelter.

Urban Pollution

The main municipalities of Colombo, Dehiwala Mount Lavinia and Kandy already have serious problems of disposing wastes such as sewage, garbage and industrial solids. The Colombo municipality comprises only a population of about 750,000 inhabitants. However, problems of waste disposal in the Colombo city is aggravated because more than 50 per cent of the population live in low income households. Their sewage and garbage are dropped into the surface water canals. It has been estimated that about three fourths of the low income population live on canal reservations. Cities that are smaller than Colombo have similar urban water pollution problems but often receive less attention.

The pace of urbanization in Sri Lanka in the future is likely to be rapid. What is envisaged is the rapid growth of small and medium towns both in number and size as a result of the decentralized development policies and programmes that are being pursued. The proportion of population living in urban areas is expected to increase to 42 per cent in 2030 (United Nations, 1998). This would mean greater demand for freshwater and the resulting pollution of water.

Industrial Waste

Industrial waste water contain many substances that could be harmful to human life and environment when untreated and discharged into the streams. The water users downstream are exposed to their toxic effects. Some of the industries that use surface-water resources from waterways are Steel, Tire, Leather and Textiles. The Central Environmental Authority estimated in 1990 that over 230 plants may be significant polluters which includes both state and private sector enterprises.

Agricultural Wastes

Agricultural waste is essentially the result of agricultural practices and agro and livestock based industries located in the rural areas. Application of fertilizer in Sri Lanka is considered to be high when compared to countries in the region. Intensive agricultural practices in certain districts of the country have already caused pollution of ground and surface water. Pesticide use has also risen rapidly. It has been found that more than 50 per cent of farmers use at least twice the recommended dose. There is no adequate data to assess the impact of fertilizer and pesticides on waterways. However, the need to monitor the pesticide and fertilizer levels in the run-off from cultivated lands has been recognized.

Towards a Water Management Policy

From foregoing discussion it is clear that the demand for freshwater has been growing in Sri Lanka particularly during the past five decades where population of the country has increased by three fold and paddy production by five times. Manufacturing sector output has increased by nearly 15 fold during the past two decades. Thus to avoid a crisis situation in the future it is necessary to conserve water, minimize pollution, manage supply and demand of water resources and slow population growth.

Sri Lanka has been successful in reducing its rate of growth of population from near 3 per cent in the 1950s to about 1.2 per cent today. This has been possible through the implementation of an effective family planning programme and investments in social development particularly in primary education and health care. As a result, the contraceptive prevalence rate has increased from 32 per cent in 1975 to 71 per cent today. The Population and Reproductive Health Policy of the Government has as one of its goals to "maintain current declining trends in fertility so as to achieve a stable population size at least by the middle of the 21st Century".

In the urban municipalities where pipe born water was supplied at no cost to its residents for decades, have now introduced user fees. The utilization of surface and ground water through water supply schemes is the responsibility of the National Water Supply and Drainage Board. The board has already established a number of water supply schemes in urban and rural areas.

The pollution of water and the water-bone diseases have also focused attention of the government of the need for water management. Since agriculture account for a significant proportion of all water drawn from rivers and reservoirs, the greatest potential for conservation lies with increasing irrigation efficiencies.

In industry which is water-intensive reusing and recycling water in the production process and redesigning production processes to require less water per unit of production are being considered.

Thus a workable water management system requires the institutional capacity to balance sectoral needs for the benefit of society as a whole and to consider the needs of the ecosystem. It is necessary to formulate policies that link the supply of freshwater to competing sectoral needs. Meeting sectoral demands is challenging because it demands efficient water management systems and equitable pricing policies.

The attention of the government is currently focused on the need for an efficient water management system for Sri Lanka. The recent drought that prevailed in the country made the government request the people to conserve electrical energy and the domestic use of freshwater in order to conserve the available water resources of the country.

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"Population Carrying Capacity in the Pacific"

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The Pacific is one of the world's least populated regions. Although the Pacific Ocean covers 35% of the surface of the earth, the region has only 0.4% of the total land area. The 8 million Pacific Island residents are distributed between 22 countries and territories (PICTs). The largest, Papua New Guinea, has a population of 5.1 million, while eight have populations of less than 20,000 people. Most PICTs have little or no industrial development. The economic activities are subsistence agriculture and public sector employment, while the main sources of revenue are tourism and exports of minerals and primary produce.

At present the balance between population numbers and available resources is such that, under normal circumstances, Pacific countries can easily feed their existing populations. As shown in Table One, FAO Food Balance Sheets for some of the most populous Pacific countries show that all are producing sufficient calories per capita (FAO, 2001). Much of the Region has relatively low population densities and rich marine resources, and most of the people appear to be well nourished. Those countries that do not produce enough food generally have the means to import what they need. Indeed, in 2000, a British assessment of the Pacific Region concluded that there was no absolute poverty, and recommended discontinuation of British development assistance to the Region.

Table One: Food Availability in Selected Pacific Countries (calories per capita)

Grand Total Calories/Per Capita/Per Day	Year				
	1995	1996	1997	1998	1999
Fiji Islands	2,834	2,860	2,905	2,920	2,934
French Polynesia	2,894	2,936	2,936	2,910	2,969
Kiribati	2,814	2,915	2,901	2,946	2,982
New Caledonia	2,787	2,793	2,788	2,795	2,772
Papua New Guinea	2,204	2,162	2,178	2,174	2,186
Solomon Islands	2,083	2,210	2,221	2,213	2,222
Vanuatu	2,743	2,750	2,738	2,747	2,766

Source: FAO (2001)

However, current population trends indicate that the generally favourable balance between population and resources is unlikely to continue. There is a shortage of land that could be adapted to modern cultivation techniques, and much of the traditional agricultural land has been depleted by over cultivation of food or cash crops, while most PICTs lack the costly equipment and infrastructure necessary to exploit oceanic fisheries. The shift towards modern lifestyles and the growing demand for imported goods is leading to the exploitation of natural resources using methods and at levels that may not be sustainable in the long term. Moreover, the Pacific Region is particularly vulnerable to natural disasters including cyclones, floods, earthquakes and volcanic eruption, drought and sea-level rise. All have the potential to impact on carrying capacity in either the long or short-term.

In assessing the carrying capacity in the Pacific, it is important to consider not only the population/resources ratio, but also the food preferences of the people and population distribution. The food needs of a population can be considered as being met only when sufficient food is produced, and

distributed and marketed while in good condition. Also, to be considered 'accessible' food must be available at prices that are affordable to the local population. Another important consideration is that the availability of sufficient food in terms of calories is not necessarily synonymous with good nutrition. If the foods that are available and affordable are insufficient to ensure a balanced dietary intake of specific nutrients, population health may be impaired.

The availability and quality of water is also a key determinant of carrying capacity. Not only must there be sufficient water for all household needs, but also a supply of safe drinking water. The main source of water in most of the Pacific is surface water, and few countries having the infrastructure to store or purify water on a large scale.

When these factors are taken into account, it is evident that there is currently little surplus carrying capacity in the Pacific Region given present population levels, while many Pacific Islanders are poorly nourished. This situation can be expected to worsen, if current land use practices and population trends continue.

This paper reviews conditions in the three sub-regions of the Pacific, Melanesia, Micronesia and Polynesia. Although the 22 Pacific Island countries and territories (PICTs) exhibit great variety of landscapes and population scenarios, the three sub-regions tend to have distinctive land types, resource endowments and cultures. The following discussion is organised by sub-region, and considers the general characteristics of each sub-region, as well as examining specific country examples.

Melanesia

As can be seen from Table Two, Melanesian countries and territories tend to have generally larger populations, larger land areas and relatively low population densities compared with Micronesia and Polynesia. A distinctive characteristic of indigenous Melanesia is the extent to which traditional society has been preserved. Although this sub-region has had considerable contact with metropolitan countries, through missionaries, occupation during World War II and exploitation of mineral and natural resources, traditional subsistence lifestyles and culture have remained substantially intact.

Most Melanesians retain a strong attachment to their village and to their birthplace, and either live in villages and practice traditional subsistence lifestyles, or return to villages whenever they can. Fiji Islands and New Caledonia have substantial non-Melanesian populations and a generally higher standard of living with more amenities, but their indigenous populations have village-based cultures and lifestyles like Melanesians elsewhere. Throughout Melanesian very remote villages can still be found, in which the people have only sporadic contact with the outside world.

Although the Melanesian sub-region has one of the lowest population densities of the world's regions, its vigorous overall population growth rate of 2.3 per cent per annum is one of the highest (SPC, 2000b). If sustained, this growth rate would double the population within 30 years. Papua New Guinea alone accounts for almost 75 per cent of the total population of Melanesia, and more than 60 per cent of the total population of the Pacific region. The population profile of the Pacific region as a whole, and for the Melanesian sub-region, is therefore determined to a considerable extent by the population patterns of Papua New Guinea, in which by far the majority of the population live a simple subsistence lifestyle in villages with few amenities. Solomon Islands and Vanuatu also have predominantly village populations,

At present, and under normal climatic conditions, Melanesia is able to feed its largely village based populations. The balance between population and resources, however, is more fragile than the low population densities would suggest. Most of the larger islands in Melanesia are hilly or mountainous and naturally forested, and arable land is at a premium. The staple food crops in the region are often grown on sloping land with thin soils.

The traditional land use pattern in upland areas of Melanesia is shifting cultivation of root crops, such as sweet potato, yam, cassava and taro, and vegetables. This involves making small clearings in forests,

Table Two: PACIFIC POPULATION FACT SHEET

Country/region	Year of last census	Population at last census	Mid-year 2000 population	Projected 2010 population	Estimated population growth rate (%)	Crude net migration rate (per 000)	Population doubling time (years)	Population density (people/km²)	Urban population (%)	Annual urban population growth (%)	Annual rural population growth (%)	Total fertility rate (TFR)	Reference period for TFR	Infant mortality rate (IMR)	Reference year for IMR	Life expectancy at birth (E0)			Reference year for E0
																males	females	both	
MELANESIA			6885100	8281600	2.4	0	30	12	21.1	3.6	1.9								
Fiji	1996	775077	824700	945000	1.6	-4	45	45	46.4	2.6	-0.5	3.3 (1996)		20 (1996)		65	69	67 (1996)	
Nouvelle-Calédonie	1996	196836	212700	248500	1.8	2	38	11	70.8	2.7	2.2	2.6 (1996-98)		7 (1996-98)		70	76	73 (1996-98)	
Papua New Guinea	2000	5,100,000	5,200,000	6,200,000	2.4	0	30	11	15.4	4.1	2.0	4.8 (1996)		77 (1986-96)		55	54	54 (1991-96)	
Solomon Islands	1999	420,000	447900	620500	3.4	0	20	16	12.6	6.2	3.1	5.7 (1995)		38 (1980-84)		60	61	61 (1980-84)	
Vanuatu	1999	193219	199800	267600	3.0	0	23	16	21.5	4.3	2.5	5.3 (1988-89)		45 (1989)		62	64	63 (1989)	
MICRONESIA			516100	616600	2.3	-1	30	161	48.2	2.8	2.2								
Federated States of Micronesia	1994	105506	118100	141900	1.9	-6	36	168	26.9	0.4	2.5	4.9 (1993-94)		45 (1990-92)		65	67	66 (1990-92)	
Guam	1990	133152	148200	171700	1.0	-11	66	274	38.2	1.9	2.5	3.8 (1995-00)		9 (1990-95)		70	74	72 (1990)	
Kiribati	1995	77658	90700	112400	2.5	0	28	112	36.5	2.2	1.0	4.5 (1995)		62 (1992-93)		59	65	62 (1990-95)	
Marshall Islands	1999	51800	51800	63200	2.0	-20	35	286	65.3	1.8	1.5	5.7 (1994)		63 (1999)		66	69	68 (1997-99)	
Nauru	1992	9919	11500	13700	1.8	0	39	548	100.0	1.8	0.0	4.4 (1992-95)		13 (1991-93)		54	61	58 (1991-93)	
Northern Mariana Islands	1995	58846	76700	90700	5.5	34	13	163	89.6	5.6	5.9	2.1 (1995)		10 (1992-96)		67	73	70 (1994-96)	
Palau	1995	17225	19100	23000	2.2	8	32	39	71.4	2.9	1.2	2.6 (1994-96)		19 (1994-96)		65	69	67 (1990)	
POLYNESIA			613147	680400	1.2	-8	58	75	38.8	1.7	1.2								
American Samoa	1990	46773	64100	80300	2.9	3	24	321	48.4	4.6	2.9	4.5 (1990)		11 (1990-94)		68	76	72 (1987-93)	
Cook Islands	1996	19103	18700	17900	-0.5	-22	-	79	58.8	0.6	0.4	3.7 (1995-96)		25 (1997-99)		68	72	70 (1995-97)	
French Polynesia	1996	219521	233000	270100	1.6	0	43	66	52.7	1.4	2.5	2.6 (1995-97)		10 (1996)		69	74	72 (1996)	
Niue	1997	2088	1900	1900	-3.1	-43	-	7	35.1	1.2	-2.4	3.0 (1991-97)		18 (1991-97)		-	-	70 (1991-97)	
Pitcairn Islands	1999	47	47	45	0.0	-	-	1	0.0	0.0	0.0	-		-		-	-	-	
Samoa	1991	161298	169200	179100	0.6	-18	110	58	21.2	1.2	0.4	4.5 (1998)		25 (1998)		65	72	68 (1997-98)	
Tokelau	1996	1507	1500	1500	0.0	-25	-	125	0.0	0.0	0.0	5.7 (1991-96)		38 (1990)		68	70	69 (1990)	
Tonga	1996	97784	100200	104100	0.6	-15	117	154	32.1	0.8	0.1	4.2 (1996)		19 (1996)		70	72	71 (1996)	
Tuvalu	1991	9043	9900	10600	0.9	-5	82	381	42.5	4.8	0.0	3.4 (1991)		29 (1996-98)		64	70	67 (1991)	
Wallis et Futuna	1996	14166	14600	15800	0.7	-9	94	57	0.0	0.0	0.7	3.1 (1991-95)		6 (1991-95)		70	74	72 (1991-95)	
TOTAL SPC COUNTRIES			8014374	9578600	2.3	-1	31	14	24.4	3.3	1.8								
Australia/New Zealand			22748000	24822000	1.0	4	68	3	87.9	1.3	0.5								
Australia	1996	17892423	18886000	20615000	1.0	4	68	2	88.5	1.3	0.3	1.8 (1995-00)		6 (1995-00)		76	81	78 (1995-00)	
New Zealand	1996	3434950	3862000	4207000	1.0	3	68	14	85.0	1.4	1.4	2.0 (1995-00)		7 (1995-00)		74	80	77 (1995-00)	

Source: SPC (2000a). Please see website *www.spc.int/demog/* for latest updates and a full explanation of these indicators.

burning the fallen timber to release soil nutrients, cultivating the gardens for one or two years, and then allowing them to lie fallow until the forest regenerates. This system of cultivation is labour-intensive and has a low impact on the natural environment. It is actually a way of utilising forests, which depends on the preservation of the forests, and can support quite large populations, as in the Highlands of Papua New Guinea.

While shifting cultivation is very effective when population densities are relatively low, increasing population numbers lead to shorter fallow periods, loss of forests, and eventually to declining yields. If the forest is cleared completely, or if fallow periods are severely shortened, productivity declines. Larger gardens, greater efforts and expenditure on fertilisers and pesticides are needed to produce the same quantity of food. If soil depletion continues, the land tends to revert to coarse grasses, such as the *kunai* grass that has spread throughout the Papua New Guinea Highlands and which is unpalatable to livestock. Fiji has also lost substantial areas of upland forests to unproductive grasslands.

Cultivation of crops such as coffee, cocoa and oil palm offer villagers an opportunity to enter the cash economy, so have displaced food cultivation to some extent. Where cash crops are produced as small-scale village enterprises, some food gardens are usually retained. An estimated 80% of the agricultural labour in Papua New Guinea is provided by women (Lloyd, 2001). Women are usually the main cultivators of food gardens, while men tend to work mostly on the cash crops. However, where large-scale commercial cash cropping has been introduced, such as the oil palm plantations in West New Britain, it may displace all food gardens entirely, leaving only inferior land for subsistence cultivation.

Although, in theory, cash cropping increases carrying capacity by producing a greater income from the same land, cash crops are vulnerable to price fluctuations as well as to pests and poor yields. When cash crop yields are good, households can afford to purchase their food needs, but if cash crops fail, villagers risk being left without either sufficient food or the means to buy it. Moreover, cash crops tend to be nutrient-hungry and deplete natural soil fertility faster than does food cultivation. Where replacement of soil nutrients is neglected because fertilisers are not affordable, prices are low or there is no access to credit, land may no longer be suitable for cultivation.

Overall, because of the larger proportion of residents living in inland villages, fish tends to be relatively less important as a food source in Melanesia than elsewhere in the Pacific. In island and atoll communities coastal fishing is a significant food source, but most commercial oceanic fishing is undertaken by foreign investors or by foreign countries operating under license agreements.

Throughout Melanesia urban areas are growing at approximately double the rate of rural areas, from both natural population growth and in-migration (see Table Two).
Although some of the movement to urban areas is short-term for employment, there is an increasing tendency for migrants to settle in urban areas. Those who move tend to be the most productive workers from the rural labour force. However, their relocation increases pressure on the agricultural sector by generating a need to produce food for non-agricultural population. In addition, changing food preferences in causing some villagers in, for example, Papua New Guinea to sell more nutritious garden foods to obtain cash to purchase less nutritious foods such as flour, rice and tea (Temu and Saweri, 2000).

Urbanisation promotes more intensive and less environmentally friendly cultivation techniques and over-exploitation of coastal fisheries to supply urban markets. When urbanisation also significantly increases the demand for imported goods, it may contribute to the destruction of environments that support traditional agriculture. Examples can be found in Papua New Guinea and Solomon Islands where mining and logging operations have resulted in destruction of forests, soil erosion and silting of rivers and coastal areas. While these activities bring much needed revenue in the short-term, in the long term they reduce the availability of productive land and reduce carrying capacity (SPC, 1998: 32-33).

Carrying capacity may also be threatened by political instability. For example, recent disturbances in the Solomon Islands severed communications and disrupted urban food markets. Fortunately many urban

residents were able to return to their villages where food was still available. This re-statement of the vital role of villages, including village agriculture, has prompted a recent national Solomon Islands strategy to strengthen villages by promoting decentralisation of services (Liloqila, 2001).

In 1993 National Nutrition Survey of Fiji found that that 94% of rural residents and 70% of urban residents grew at least some food, but none met all their own food needs. Although per capita production of food increased during the 1990s, it is evident that environmental degradation and over-exploitation of natural resources such as fisheries is eroding the long-term capacity to produce food (UNICEF, 1996). Booth (1999) comments that although food security has long been a concern in Fiji, a poverty report of 1997 estimated that 33% of the population were living in relative poverty while 10% of households could not afford a basic diet.

A further threat to food security in Fiji is prolonged political instability, which has had particularly deleterious impacts on food production since May 2000, resulting in a substantial decline in export earnings from the two major revenue earners, tourism and sugar. This, in turn, caused workers to be laid off throughout manufacturing, construction and service industries. Since more than 46% of the population of Fiji Islands lives in urban areas (Fiji Bureau of Statistics, 1996) and is thus largely dependent on food purchases, households that lose their breadwinners experience difficulty in meeting their food needs.

Melanesia is also vulnerable to a greater range of natural disasters than the other sub-regions. Solomon Islands and Vanuatu are very high-risk areas for cyclones, which frequently inflict severe damage on crops. Although severe earthquakes and volcanic eruptions tend to occur less frequently, they can create major food emergencies, as in the case of the 1994 eruption in East New Britain that destroyed Rabaul. The larger and higher islands of Melanesia are also vulnerable to drought and frost.

In Papua New Guinea it is clear that population numbers have increased to a level where safety margins in food production have become small. In 1997-98 a series of late frosts accompanied by much lighter than normal seasonal rains led to general failure of the staple root crops throughout the upland areas. By the end of 1997 it was estimated that almost one million people, or about one fifth of the total population, had insufficient food and needed food relief (AusAID, 1998). Despite costly food relief programmes, most people survived on local food or on provisions purchased by the Government of Papua New Guinea. However, increased reliance on important food had reduced the range of plant stocks and diversity in gardens, which has hindered the ability to recover from adverse climatic conditions (Saweri, 2000).

In addition, many rural dwellers experienced severe shortages of safe drinking water during the drought, on both the mainland and in the islands. Melanesia normally receives good rains throughout the year, and villagers in Papua New Guinea, as elsewhere in Melanesia, tend to rely on streams for all their water needs, and seldom store water. The Papua New Guinea drought caused a reduced flow of water in streams, while others dried up completely. This left many villagers with an absolute shortage of water, as well as an increased risk of contamination of the water that remained. Lack of water was also a major cause of closure of village health facilities during the drought period.

During 1997 and 1998 the Government of Papua New Guinea, assisted by the Government of Australia, mounted an extensive relief operation to distribute rice, flour, oil, drinking water and seeds to the population in need. A subsequent evaluation of Australia's part in the drought relief operation found that the impact of the drought had been ameliorated to some extent by traditional coping mechanisms. These included switching to low cost foods, selling household assets to buy food, selling or eating pigs (a traditional store of wealth) and temporary migration. Where sufficient forests remained, people were generally able to meet their food needs by switching to 'bush foods'. Even so, it was apparent that a major effort was needed to improve security of food and water (AusAID, 1998).

Papua New Guinea's population, and also those of Solomon Islands, Vanuatu and to a lesser extent, Fiji, have young age structures, suggesting that the current Melanesian growth rate of 2.4% per annum is likely to continue. Present methods of cultivation and resource exploitation seem unlikely to support twice as

many people without a major decline in already low living standards.

Micronesia

Most Micronesian countries and territories have much smaller land areas than are found in Melanesia, and many have extremely dispersed territories. For example, Guam and Nauru each comprise a single small island. In contrast the Republic of the Marshall Islands comprises 29 atolls and 5 small islands scattered across some 2 million square kilometres of ocean, with a total land area of only 181 square kilometres (Republic of the Marshall Islands, 2000: 2). Kiribati, with only a little more land, stretches halfway across the Pacific Ocean. Agricultural land is scarce in much of Micronesia and virtually absent on coral atolls which may grow little more than coconuts and breadfruit.

Although the Micronesian traditional society was hierarchical and village-based, subsisting largely on fish, coconuts and fruit, much of this sub-region has been dramatically transformed by contact with metropolitan nations, especially the United States. This region is now heavily urbanised, and virtually the only remaining enclaves of traditional Micronesian culture are in Yap and Kosrae (in the Federated States of Micronesia) and the outer atolls of Marshall Islands and Kiribati.

The effect of urbanisation and modernisation on the carrying capacity of atoll nations can be clearly seen in the Marshall Islands. Around 65% of Marshallese now live in crowded urban areas, depending almost entirely on imports of food and consumer goods. Although the Marshall Islands probably still has the capacity to support its current population of 52,000 in a subsistence lifestyle based on fish, coconuts and breadfruit, the people do not wish to live this way (McMurray and Smith, 2001: 157). The urban lifestyle that most Marshallese prefer involves a heavy reliance on imports. Because of the high freight costs, more nutritious imported foods such as fresh fruit and vegetables are very expensive and beyond the means of most Marshallese households, as well as being available only sporadically. The staple diet for the majority of urban Marshallese comprises only the cheapest imported foods; rice, white flour products, tinned mackerel and low-grade meats such as frozen turkey tails and mutton flaps. This has contributed to poor nutrition status and a high incidence of non-communicable diseases.

At the national level, the major sources of revenue for the Marshall Islands are the US military base at Kwajalein and American economic assistance, but the return from these sources is not assured in the long term. Pressure to raise revenue from alternative sources has led to the sale of fishing licenses to foreign countries, enabling them to undertake large-scale exploitation of the Marshallese oceanic fishery resources for a much greater return than the cost of the licenses. Thus, because it lacks the equipment and infrastructure to exploit oceanic fisheries, the Marshall Islands is selling off its marine reserves to fund costly imports of food. Ironically, much of the imported food is actually less nutritious than the fish that enabled its purchase.

Economic restructuring in recent years has threatened Marshallese food security at the household level. In the 1995 almost half of the 8700 wage jobs in the Marshall Islands were in the public sector. Since then economic restructuring resulted in the loss of several hundred jobs. Many of those who were retrenched were sole wage earners in households of as many as 12 people or more, so this attempt to rationalise the public sector had a negative effect on household food security (McMurray and Smith, 2001).

A similar situation can be seen in Guam, where US military operations are also the mainstay of the economy, along with tourism. Little food is grown on the single island of Guam. Recent cutbacks in US military activities and a decline in tourism, have threatened Guam's capacity to import. This, accompanied by an unexpected increase in the fertility rate, has demonstrated the delicate balance between population and resources in this territory. Even in Palau, which is relatively land rich relative to its population size, the 'safety net' provided by village food production is very limited and it is difficult for people to manage without the services and resources provided by the urban areas. This was demonstrated in 1996 by the collapse of the K2 bridge, which links the densely settled island of Babledoab to the capital Koror (Rarick, 1997).

Nauru and Kiribati, which were developed by Britain rather than by the US, have similarly limited ability to feed their people. Both had natural reserves of phosphates that earned considerable revenue in the past, but which are now largely depleted. Phosphate earnings have enabled Nauruans to enjoy a very high living standard based wholly on imported goods, since the single island is tiny and so ravaged by phosphate mining that there is virtually no productive land. The only significant domestic food production is a small fish farming operation and some coastal fishing.

However, the reserves Nauru accumulated from phosphate mining have now diminished, and average per capita income is about half that of the 1980s. Although Nauruans are still relatively well off, if the Nauruan population continues to increase while phosphate returns dwindle, food security could be affected. In addition, Nauru already faces frequent water shortages. There is no water purification plant on the island, and imported bottled water is the only safe drinking water. A further threat to food security in Nauru is the unreliability air services. When flights are delayed or do not arrive, perishable foods such as fruit and vegetables are unobtainable.

Kiribati is one of the most dispersed nations in the Pacific. The only significant food production is fish, coconuts and fruit, plus a few pigs and chickens. There is virtually no tourism in Kiribati, and since the depletion of the phosphate reserves, the only major source of overseas earnings have been coconut products and the export of labour, especially seamen (SPC, 1998: 27). The difficulty of obtaining social services and economic opportunities in remote atolls has caused the population to concentrate in the western atolls.

Although the overall population density in Kiribati is only around 100 people per square kilometre, it exceeds 800 in South Tarawa, which now accommodates some 34% of the total population. Despite this high density, most people in Tarawa live a semi-village lifestyle with few modern amenities, since there are few opportunities for employment other than in Government services. The Tarawa lagoon surrounding has become severely polluted, and this is having a negative impact on coastal fishing, as well as on population health. In addition, there are frequent shortages of safe water. Kiribati imports substantial amounts of food, especially meat, milk products and vegetables, but also fish and other food. The value of food imports increased by more than 50% between 1987 and 1997 (Snowdon, 2000).

The many atolls of Micronesia are particularly vulnerable to sea level rises. On most atolls the highest point is only two or three metres above sea level, and even higher-than-normal tides can cause flooding. Recent increases in sea level associated with global warming have caused major concern in Micronesia.

Viewed as a whole, Micronesia has approximately the same population density as Western Europe. That is, it shares the distinction of being the world's most densely populated region, even though it has only very limited ability to produce food and few readily exploitable resources (SPC, 2000b: 50). Almost 50 per cent of Micronesians are classified as urban residents. Despite high population densities, the average annual population growth rate for Micronesia as a whole equals that of Melanesia, which means the population would double in 30 years if this rate were sustained. Whereas some Northern Micronesian countries may be able to absorb further population increases by expanding manufacturing, and others by emigration to the United States, it seems inevitable that further population growth in Kiribati and Nauru will be matched by declines in living standards.

Polynesia

The third sub-region, Polynesia, resembles Micronesia in that it comprises atolls and relatively small islands, but Polynesians have their own distinctive ethnicity and village-based culture. While Samoa has a quite substantial and cohesive land area, other countries such as Cook Islands, Tonga and Tuvalu have widely scattered atolls and islands. A crucial difference between Polynesia and Micronesia, however, is that Polynesian population growth has been largely offset by extensive emigration. This means population densities have tended to remain low, even in countries and territories with only very small land areas.

Cook Islanders, Niueans and Tokelauans are citizens of New Zealand, and this has resulted in larger communities in New Zealand than in the home country. As shown in Table Three, in 1996 there were more than twice as many Cook Islanders living in New Zealand as in Cook Islands, more than nine times as many Niueans as in Niue, and more than three times as many Tokelauans.

Samoans and Tongans, who do not have citizenship rights, have also established large communities in New Zealand, with almost two thirds as many Samoans in New Zealand as in Samoa, and around a third as many Tongans as in Tonga. There are also significant communities of Samoans and Tongans in Australia, many of whom have migrated to Australia after first obtaining New Zealand residence.

Table Three: Polynesians in New Zealand

Ethnicity	1996 NZ census count	Estimated 'home' population
Samoan	101754	171000
Cook Islands	47019	19000
Tongan	31389	97800
Niuean	18474	2000
Tokelauan	4917	1500

Source: Cook et al. (1999), SPC Statistics Programme (2000)

American Samoans have free access to the United States, and French Polynesians and Wallisians and Futunians can move freely to France or other French territories, while the British Government has made several attempts in the past to relocate the handful of Pitcairn Islanders rather than maintain this very small colony. The only Polynesian country that has limited opportunities to migrate is Tuvalu, and as a result Tuvalu is facing increasing population pressure that is beginning to impact on food security and cause considerable concern (see Table Two).

Emigration has made a positive contribution to Polynesian economies by reducing population pressure and generating income in the form of remittances to families who remain in the home country (see Bertram and Watters, 1985; Connell, 1990). Returning migrants also usually bring home money. Migration has thus increased the capacity of these countries to import goods and to invest in the development of local industries, such as tourism and pearling.

However, there are also negative aspects to emigration. Although it may have augmented Polynesian economies to some extent, it has also made them vulnerable to changes in economic conditions and possible reductions of immigration quotas in countries on the Pacific Rim. Emigration also has encouraged the persistence of high fertility by offsetting natural population increase, so if opportunities to migrate were suddenly reduced these countries would be faced with population growth rates comparable to those elsewhere in the Pacific. Moreover, since migration tends to be selective of young educated people of working age, it skims off some of the most productive human capital, leaving behind relatively higher percentages in the dependent age groups.

Even though there is currently a generally favourable balance between population and resources in Polynesia, there is still little excess carrying capacity. Even in Samoa, one of the larger countries with low population density, most land suitable for cultivation is already in use, and, extension of the cultivated area would mean utilising traditional methods of cultivation on steep slopes and thin soils. Although such labour-intensive activity could help reduce youth unemployment, one of Samoa's major concerns, the

demand is for jobs in the modern sector, not in agriculture. Samoa has established a beef cattle industry, but although this is a less labour-intensive method of utilising marginal land, it produces high-cost food that generally does not greatly increase carrying capacity.

Even Tonga, which is generally known for the abundance of food and problems of obesity rather than food shortages, is not always self sufficient in food. Tonga averages one cyclone every four years, and it can take up to six months for food production to return to normal levels after cyclone damage (Halavatau and Halavatau, Forthcoming). The value of food imports more than doubled between 1987 and 1997, principally dairy products, meat, vegetables and cereals (Snowdon, 2000). In most cases the imported items are cheaper than the local equivalent. In the case of meat, although Tonga produces both pigs and poultry, pigs tend to be slaughtered in large numbers for major festivals and social events, so meat supplies are not continuous throughout the year (Halavatau and Halavatau, Forthcoming).

Polynesia is currently facing the prospect of a reduction in its limited land area because of sea-level rises. This is of particular concern to Tuvalu, which comprises nine low-lying atolls and already has a population density of around 400 per square kilometre. Another consideration in Polynesia is vulnerability to cyclones, which, although irregular, can inflict massive damage on crops and create severe shortages of safe water. Safety-margins are therefore needed to ensure that countries can survive the impact of such natural disasters on food supply.

Coastal fisheries have been severely depleted near the major urban areas throughout Polynesia, and pollution is becoming a concern in larger urban centres such as Papeete and Apia. As in Micronesia, most Polynesian countries lack the resources to undertake large-scale oceanic fishing. One exception is American Samoa, where fish processing is the major industry. High wages at the canneries have attracted labour from other Pacific countries, especially Samoa and Kiribati, and the inflow of migrant labour plus a high natural growth rate has become a concern. A recent report estimated that if present trends were to continue, within 30 years the country would no longer be able to provide sufficient water to meet population requirements (American Samoa, 2000).

Conclusion

As stated at the beginning of this paper, there is no 'absolute poverty' in the Pacific Region, in that most people have access to sufficient food and water under normal circumstances. The carrying capacity of the Pacific is determined not by absolute potential to produce food, but by population distribution and limited purchasing power, by food and lifestyle preferences, and by lack of capital to exploit resources. Pollock (2000) points out that in small island states, political and economic barriers prevent food security is as much as the restricted resource base. When natural disasters occur or when purchasing power is further reduced by economic problems, it is evident that safety margins are very small.

The vast majority of Pacific Islanders live simple village lives or in very humble conditions in urban areas. Most have little or no opportunity to achieve material well-being, job security or the conveniences of a modern lifestyle. This is especially true for the many unemployed school-leavers in the burgeoning urban areas of Melanesia, who have little prospect of obtaining work and a pathway to a comfortable modern lifestyle. Poverty of this type can be thought of as 'poverty of opportunity' rather than absolute poverty (UNDP, 1999: 34).

In the past Pacific people were reasonably assured of sufficient food, but this assurance is no longer there for all. Numerous recent studies in various parts of the Pacific have found significant levels of under-nutrition and vitamin deficiencies in children and poorly nourished adults (see various papers in Snowdon, 2000).

South Pacific Consumer Protection Programme (1999) lists ten factors contributing to food insecurity in the Pacific:

- The change of diet from locally produced to important foods
- The change from subsistence to a cash economy
- Population movement to urban areas
- Lack of development of a sustainable economic base
- Loss of traditional values and leadership and changing gender roles
- Reduced quality of environment due to over-exploitation and climate change
- Dumping of poor quality imports
- Fragmentation of cultures and customs
- Change from a village-based communal lifestyle to a Western urban lifestyle
- Uneven sharing of wealth and benefits

Boruga (1995) expands on these causes, explaining how inappropriate communication between government officials and communities has limited the effectiveness of development strategies that should have remedied these problems. Another major obstacle to more efficient land use and an increase in carrying capacity in the Pacific Region is land tenure. Almost all land is customary land, and it is usually very difficult for individuals or families to establish clear titles. This limits the sale and consolidation of land, and encourages over-exploitation to bring quick short-term profits. It also means that many people to do not have access to land even to feed their own household.

It is therefore evident that carrying capacity in the Pacific Region cannot be determined from simple population to land ratios and food production statistics. Although there may be no absolute food shortage in the Region, in today's world, much more is required to ensure what is generally regarded in developed countries as an acceptable lifestyle. A broader assessment of carrying capacity that included capacity to support populations in a modern lifestyle and capacity to sustain the demand for imports would probably conclude that most Pacific countries are already overpopulated.

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Discussion

MR. TAO XIPING, MP (CHINA):
Water resource is the important resource that each human society relies on. It is the most important factor to condition the ecological environment. Today, problems of water shortage and water pollution are expanding in the Asian region. China is the country with a scarcity in fresh water in comparative manner. Water resource per capita reaches only one forth of world average level. Furthermore water resources distribution in China is geographically off-balanced. The area to the north of Yangtze River has population of 44% and the cultivated land of 59% of the whole country, however, water resources is distributed only 14.7 % of all water resources available in China. So north-west region is bigger drought area, and polluted by serious shortage of water resources. Besides development of urban and rural economy, shortage of water resources is on the acceleration and water pollution in this region is worsening. One third of the rivers in the country is contaminated and urban rivers are highly polluted. Since 1949, China started to preserve the water resources and manage the water pollution. Through various water projects, China has been preserving water resources by developing the water channels. As a result of irrigation system, people in urban and industrial areas were able to receive water resources efficiently. We need to take various measures by inputting various technology to increase the efficiency of water-usage.

DR. SURAPATY, MP (INDONESIA):
I have a question for Dr. Uchijima. On your paper, you have mentioned that one factor of demand side is European initiation of meal. And carrying capacity would require a highly organized global and regional effort of both developed and developing countries. Could you more elaborate about the Europeanization of meal? Isn't it a relation to the social and political globalization? I think the inter-relation of rich countries and poor countries is not equal so is there any concrete effort to make this relation more equal?

DR. UCHIJIMA:
The important issue here is the income rise which is the one of the factors of demand side. As income rises, the contents of meal would change. For example, people eat more meat, this is really the trend of many countries would follow today. Let's look at Japan in the 1950s, 60-70% of necessary calories were carbohydrates, for example, rice, wheat, and potato. But currently in Japan, it started to change and the energy from carbohydrates is approximately 40% instead of 60-70%, and the rest of the nutrition is coming from fat and meat and proteins. As you are aware, as income level increases, the meals are changing from more grain-centered carbohydrate to more meat and daily products. For example, producing 1 kilogram of beef, you need 7 kilogram of grains. And for producing 1 kilogram of pork meat, we need 4 kilograms of grains, and for 1 kilogram of chicken meat, we need 2 kilogram of grains. So with more meat in our diet, nutrition becomes much better, but on the other hand, we are consuming a lot more cereals which means production of cereals goes dramatically higher. Japan, South Korea, and China are leading to this sort of trend.

So now we have over consumption of oil, fat and meat. So called "Adult diseases and illness" that actually become very widely spread. And in order to treat these adult diseases, we need a lot of social capitals. So when we look at our meals we eat, we are not only going to the direction of meat-centered food with rising income, but we must do as the US health agency has said that we must go to more healthier foods. In Japan, Ministry of Health and Welfare as the leading government agency said we should follow more Japanese style meals, which is more grain consumption, more carbohydrates, where we should consume 50% of our nutrition and Ministry is really trying to guide the people in this way. When we look at this sort of meal situation, whether it's a developed or developing country, we must really look at healthier foods so that people of each country can lead the healthier life. This is an area we have to resolve also along with the food shortage. We must actually have meals that would provide health and stable lifestyle for the people of the world. With very excessive aging society, this is a very important factor. So with developing countries and developed countries, both types of countries wherever you are, each of the governments must make an effort to give an guidance so that people in the country would be able to consume healthy diet.

DR. TEO HO PIN, MP (SINGAPORE):
I have a question for Dr. Uchijima. You mentioned that carrying capacity is dependent on land use pattern, climate and agricultural technology. How can we increase the capacity of land use pattern? How can we increase agro-technology to improve the production?

DR. UCHIJIMA:
Land use pattern changes with population density. Let's look at 25, 50 years ahead from today, the population in the Asia will be 1.5 times more than the current population. If that is the case, obviously arable land ratio and forest land ratio would be much lower than what it is today. So the most important thing is fertile land must actually be increased and maintained, and this becomes a very important question. Fertile land exist around big city and it is constantly be urbanized, and it has been really threatened by the cities. And this is a very important areas so that world arable land is becoming lower worldwide. The most important thing is that we implement high yielding agriculture. And we still have to actually think of how we are going to create the super high yielding agriculture. And this becomes the biggest target. But we must think of not degradating the environment, and we must also produce safe food. And these are challenges which are very difficult to overcome.

MS. NAPSIAH OMAR, MP (MALAYSIA):
I'd like to direct my question to the Dr. Uchijima. In your discussion, you talked about land space and shortage of land space. We have not discussed about the possibility of using the ocean. Can we use our ocean as our farmland in the future?

DR. UCHIJIMA:
The earth's surface, there are 6,380 kilometres of globe. Earth is a huge globe. But when we look at human activity, it's contained in a limited area. And 70% of globe is actually ocean, as you all know. Currently, us human beings consume about 100 million tons of fish in the form of seafood. Right now, the land is actually 30% of the global surface, as we take about 20% of this for agricultural land. And there are timbers and forests... When we add all of this up, we have about 1.5 billion tons of edible foods from the land. So when we look at ocean productivity—that's about 1 billion tons. So that would be only one-fortieth of the productivity compared to the land. Why is the ocean productivity low? This is because when we look at the surface area of the ocean, organic substances such as minerals lack in the ocean surface. Areas where minerals are more abundant are near the coastal lines or it could be areas close to the big river or where there is an upwell zone such as the California region or the South American region such as that close to Argentina where El Nino phenomenon takes place. That's where deep water rises and a lot of nutritious substance and minerals occur and gives rise to high productivity. So when we think of this background, in order to have more products from the ocean—and to have more food from the ocean—it actually is a big challenge for us. It is very difficult. Currently, organizations such as FAO, are carrying out studies and ocean production. One hundred million tons of the productivity from the ocean is probably the upper limit according to their research. So we face a lot of problems in the future in terms of the development of ocean. This is my opinion.

MR. LAKSHMAN SINGH, MP (INDIA):
In your paper, talking about production of cereals in Asia, you mentioned about rice, wheat and corn. Production of pulses is also a very important factor. Pulses also form a very important part of cereals. So would you like to tell us about the possibilities of increasing pulse production in Asia? And North Asian countries also pulses and depend on production of pulses. Thank you.

DR. UCHIJIMA:
The most important food product is cereal. Potatoes, sweet potatoes and cassava—all of these potatoes are also very important. Pulse is also very important—I think beans are important in Asia. China is the main production area and they produce about 1.2 million tons. Meanwhile, 100 million tons are produced in the U.S. U.S. is the largest producer of beans. This is a very good source of protein and also a very good source of fat and protein. So it will be important. But the important thing is—this applies to beans—it requires a lot of water resources to cultivate. According to the category of crops that requires a lot of water.

For example paddy rice is in C1 and C2 category. Beans fall under C4 category. C4 category includes crops such as maize and sugar cane. And for C3, rice paddy and wheat are included as well as soybeans. In order to produce 1 ton of each crop, we have to think about how many units of water are necessary. Let's take a look at maize. In order to produce 1 ton of maize, roughly 850 tons of water is required. For C3 crops such as paddy rice, 1,500 tons of water is required. For beans under the C3 category, it requires about 1,800 tons of water in order to produce 1 ton of soybeans. In that sense, in order to produce more beans and to use them for food or to improve our food—of course, that is one possibility. However, it will require more water resources for the cultivation of beans. Whether it is possible to expand such cultivation is questionable.

DR. SURAPATY, MP (INDONESIA) :
The second question to Dr. Uchijima about the concrete effort to highly organize global and regional effort by both developed and developed countries. So I would like to relate to maybe Dr. Abeykoon of Sri Lanka. Is there any influence of social and political instability, and economic crisis, on this carrying capacity and population?

DR. ABEYKOON:
Certainly social and economic stability is important for any country to make progress, to implement programs effectively. But more than that, even if there are periodic changes of government, as taken place in Sri Lanka, if there is political commitment, then you can implement the program effectively. For example, in the case of Sri Lanka, subsidy of governments has supported implementation of effective population programs in our country. That has brought about results. We have been able to implement the family planning programs by using national and international resources effectively. And we have been getting the successful results. Child mortality rate used to be 140; however, the rate has been decreased dramatically in 50 years. Maternal mortality rate was 200 per 100,000, but now it has been reduced to about 24. Also the population growth rate was 3% in 1950, but now is 1.2%. It is the result of continuity of implementation of programs even there is a change in political power.

VIETNAM:
Dr. Abeykoon, your presentation was nice but we would like to know what is the policy for managing water resources in your country. Can you say something about that?

DR. ABEYKOON:
As I mentioned, there are 3 main areas that are the largest consumers of water resources—agriculture, industry and domestic use as a result of population growth. Now with regard to agriculture, most of agriculture has been irrigated agriculture. But we had not enough amount of water. Water was scarce as a result of that system of agriculture. Now we are trying to introduce more manageable and more effective system of paddy production. That's one. Again in industry, they're trying to see how water could be reused and also to see that per capita production can be utilized. And of course in the other areas of reduction of population we have been quite successful because we have been very much dependent on monsoonal rains for water resources. As weather patterns change as a result of deforestation to some extent in our country, we can no longer depend on that system of supply of water. Therefore, we want to, on the one hand, to conserve water resources through improvement of efficiency in agriculture, in industry, also in domestic use of water, as I mentioned. In the municipalities for a long time, water was supplied at no cost. Now we have introduced user fees into that system as well.

DR. MALINEE, MP (THAILAND):
I would like to ask Dr. Abeykoon from Sri Lanka. I think that the quantity of water is quite enough. But how about the quality of water in your country, and have you managed anything concerning about the quality?

DR. ABEYKOON:
Pollution has been the main factor. Pollution of water particularly, as I mentioned in my paper, is the crime of municipality. Fifty percent of the population in municipality live in low-income households and a lot of

garbage is dumped into rivers and other areas around the city. So that's an issue. Then again, in agriculture, the excessive use of pesticides and insecticides have also caused a problem. In certain districts, in fact, surface water has been polluted as a result of excessive use of fertilizers. So we are very much concerned about that and trying to improve the quality of water.

MS. CHADWICK, MP (NEW ZEALAND):
My question is to Dr. McMurray. In your presentation, you've added another detriment to population carrying capacity of food and water. How as politicians who you suggest we can influence the expectation of modern lifestyle in the Pacific?

DR. MCMURRAY:
A very difficult question. I really don't quite know how to answer but the Pacific people, of course, have had a lot of contact with the developed nations for many years, starting with the whalers, the sailors and the missionaries. And they also—lot of them are very mobile, certainly in Micronesia and Polynesia. So they see the modern lifestyles. Now, I think it's really a matter of equity that the people feel that they have an entitlement to living a non-rural lifestyle if they wish to in the way that people in developed countries do. I wonder if it is equitable to say, "Well, there's enough food if you all stay in the villages and cultivate. And I'm afraid you can't move out. This is obviously a tenable position. And I think that modernization is an affect that would happen regardless. Now how we deal with that is another issue. Modernization has spawned a lot of problems to the Pacific. It has brought problems of poor nutrition, of non-communicable diseases, of unemployment, of young people, of inequities of all sorts. And yet, it is a human right to live the way you wish. Now, I think the only strategy is to make it easier for people to live modern lifestyles. To look for ways of increasing incomes, ways of employing people, for diversification of economy, and for provision of jobs. I think there has to be placement. I think that it is the area where assistance is needed. But I cannot give you the magic key. But there's no double that these are the issues that these countries would have to deal with.

DR. U-WHA CHUNG, MP (REPUBLIC OF KOREA):
Maybe this is a little bit different topic but I think this is related to carrying capacity in Asia. Especially, I would like to talk about the so-called yellow sand phenomenon which is influencing mainly China, Korea and Japan. Maybe Mr. Chan or a Chinese delegate can give some idea and what you do for its prevention. And maybe Professor Uchijima can also give some idea about that. As you mentioned, global warming is widening the area of desert and recently I think the rainfall is also decreasing slowly. So I think this is a quite serious problem in China, Korea and Japan. Especially, the yellow sand wind phenomenon in the spring time, in April or May. I think we have to make some effort to prevent this phenomenon. Please give me your idea—what you are doing, or what you are thinking about it in China and Japan.

DR. UCHIJIMA:
This yellow sand phenomenon that you talk about does affect not just China, Korea and Japan. It does affect all the outlining regions surrounding the desert. When Darwin went to Morocco in Africa on Beagle—he was sailing on the eastern part of Morocco—and he called it the Dark Sea. He meant that yellow dust—it wasn't the yellow sand—that was brought from the Sahara and cut the sunlight and made the area very dark. So it is a global phenomenon that affects not just the neighbouring regions. Yellow dust crosses the Pacific. You can see it in Hawaii and even in the western coast of United States. The yellow dust from Sahara is seen in Cuba and in Florida—and it comes from Morocco. So think this is a global phenomenon and I think that's the right way to approach it. Having said that, from the Gobi Desert and Taklamakan Desert, how far and what impact does that sand have? When we observe the solar radiation, we see that when yellow sand reaches Japan, about 20% of solar radiation is decreased. That is the impact, and if it is prolonged over time, it's going to have an adverse impact on the Japanese climate. But fortunately, this yellow dust falls on limited period and they settle in the Pacific Ocean. So I think this is a temporary phenomenon and does not really have a large impact on the Japanese climate or the climate in general. For that matter. This yellow dust cloud is a phenomenon that is observed on the desert regions around the world.

And the second question is whether this is going to be enhanced or intensified because of the global warming and the changes in the global climate. The global warming does accelerate the cycle of water. According to the estimates based on the global climate model, about 7% of the rainwater is increased, but uncertainty is very large, of course. Having said that, does every region enjoy 7% increase in rainfall? In the middle latitude where the population is high, there is a trend where rainfall decreases, not increases. So where does the rainfall increases? It increases in Siberia! On the other hand, when you have less rainfall, evaporation increases with the rising of temperature. One degree centigrade increase means 4% increase in evaporation. When that calculation method is used for the middle latitude, the effect of drought becomes more intense because desertification would intensify in the desert areas and arid areas because of the decreased rainfall. Unless governments take actions to arrest or stop the desertification, there will be more desertification in the arid regions of the world and in deserts of the world.

DR. U-WHA CHUNG, MP (REPUBLIC OF KOREA):
Do you think there is anything we can do for prevention? Recently, I heard that the three countries—China, Japan and Korea—they came up an idea of using some trees and planted these trees in the desert area of Gobi. Do you think these kinds of efforts would work? Or are there any other methods?

MR. TAO XIPING, MP (CHINA):
In the recent years, we have had frequent yellow sand. I think it's basically coming from Inner Mongolia. I think some of it is caused by natural reasons and some of it is caused by human beings. Deforestation of the forests around the deserts has impact on the water conservation of the forest. I also agree that global warming may be another reason, and yellow sand has very serious influence on Southeast China as well as on Japan and Korea. We have to take some measures. One is to stop the deforestation in the upper reaches of the river, and another is to plant more trees. We have to ask for planting of more trees. We should manage the forestation in the watersheds. The other measure is to solve the problem through concerted efforts of China, Korea and Japan. It will take many years but we will have to take concrete measures to solve the problem.

DR. SAMEJIMA, MP (JAPAN):
I have a question for Dr. Uchijima, and a question for Mr. Abeykoon and Dr. McMurray. Dr. Uchijima talked about the need for super-high yield in agricultural method. In order to realize such super-high yield in agriculture, can we expect much from biotechnology? That is the question to Dr. Uchijima. To the two speakers, dumping of industrial waste is having adverse effect on agriculture, Mr. Abeykoon said. And Dr. McMurray said that water is polluted at coral atoll and having adverse effect on fishery resources or ocean resources. In order to prevent the deterioration of lagoon water quality, or in Sri Lanka, what can be done?

DR. UCHIJIMA:
The talk is about high yield in agriculture. It means combining full resources—technological resources—and the second is biological resources. And biological resources mean improved high yielding varieties, use of improved high yielding varieties, as represented by the Green Revolution. In technological resources, the use of more effective fertilisers, the use of agricultural chemicals, combines with efficient use of agricultural machines and the management of irrigation systems, and also a sophisticated information system. These combined could lead to a high yield, but food habits and high yielding agriculture support the global population today. The input of energy, the survival energy, is one to one even in grain production. It's reduced to that extent. In animal husbandry or greenhouse culture, the ratio is less than one now against the input of resources. So the amount of fossil energy that is input, you're getting less than one to one of fossil energy that is input in terms of agricultural output. The super-high yielding agriculture means how much one can enjoy high yield with a given unit of land to be cultivated. And this is very important in order to sustain the carrying capacity of the global population. And I think there are two ways of going about this. One is the use of biotechnology—the use of DNA manipulation or modification. Improving the harvest index is also one way—it is one thing we can do—to improve the harvest index. It used to be 0.2 or 0.3 or 0.35. So the rates have increased, and this must have contributed to the harvests. And we should improve the harvest index more from 0.35. And I think that this is one route we can take in order to improve this. And the other is the water use efficiency—to reduce the amount of water needed for a unit of production of

food. I think that there is much study done in this regard. How do we improve water efficiency? This is very important. In arid areas, it means that we can produce food in arid areas if we can improve the water use efficiency. I think today, there are some advanced studies in bioengineering but it has not come to the yield of production, but for subsistence agriculture it can be done. So how can we use that in commercial production? So that can be the second route one can take. And I might add that CO2 concentration of 360ppm... I think some research institutes in Japan have been studying this, but they have not come up with good results so it might be very difficult. Improving the harvest index and improving the water use efficiency, the use of DNA modified technology might be our best way out.

DR. ABEYKOON:
With regard to Sri Lanka, as I mentioned in my paper, agricultural output has increased by about five times in the last 50 years. And during the first two decades, the output increase was mainly due to increase in area of cultivation—it's called "extensive cultivation." The last three decades, it has been due to intensive cultivation, with application of high-yield varieties, use of fertilizers and pesticides, and as I mentioned, use of both fertilizers and pesticides has been excessive in Sri Lanka and in certain districts, we now have found it has polluted surface ground water. So the agricultural output that we have achieved, the fivefold increase, is not without cost. It's an issue now and we feel, as I mentioned in my projections, with slow population growth rates, we'll have a smaller population size to feed and therefore there will be less pressure on the water resources.

DR. MCMURRAY:
I would like to refer to both of your questions. To begin with the high-yielding varieties, there has not been a great use of high-yielding varieties in the Pacific, although the Melanesian people have developed many different species of tubers that they cultivate. There are a vast number of sweet potatoes and yams. These are varieties that are adapted for local condition. There are very few irrigation systems in place so they cannot use irrigation to tend on crops very extensively. There are few households that can afford extensive investment in fertilisers. But by the same token there has been a great development of natural crop varieties in Melanesia in particular. Possibly there is scope for more, but it would have to be adapted to the capacity of households to cultivate what are often very demanding crops. There is also developments in cash crops such as coffee, tea, palm oil and so on, but there have been local adaptations.

I'd like to refer to your second question on pollution, and take it a little further, referring to a kind of pollution as a result of urbanisation which I discussed in my paper. The biggest problem in the Pacific for pollution is very high cost of dealing with anything with any kind of processing. Very few Pacific countries have recycling programs. Even New Caledonia, which is one of the richest countries in the Pacific, does not have any glass or paper recycling. There is aluminium can recycling, but there is no recycling of glass and paper in one of the richest countries. It seems to me that there is a need for rethinking attitude as regards pollution in the Pacific. Traditionally, there were no waste products which were not biodegradable. Now it's far too simplistic to say that people are simply throwing down rubbish because they've always thrown down rubbish—and I've heard people say that. That is not true. But the problem is that the cost of dealing with rubbish in the Pacific is very high, and I don't think that governments and donor agencies have yet recognized that this is a cost of urbanization, which must be treated as part of modernization package. Perhaps referring back to your question, Honourable Ms. Chadwick, perhaps that is an area where New Zealand and other donors could be helping. Because these are costs which these poor countries are not in a position to meet. So the issue with pollution is that of cost, for which there are no resources available to deal with.

MR. TOLFUAIVALELEI, MP (SAMOA):
Vast majority of Pacific Islanders live in poverty of opportunity rather than absolute poverty. Could you elaborate, at first, how to overcome this poverty of opportunity—how to make equal opportunity?

DR. MCMURRAY:
The first step of course is education and the second step is employment. And the biggest shortage in the Pacific is employment opportunities, although there have been quite considerable advancements in

education and many countries are approaching 100% education of young people. There's also quite heavy investment in secondary education but there are not jobs for young people and this is the biggest issue. It's poverty of opportunity in that there is not the opportunity to get a job to increase your living standard and to live a comfortable modern lifestyle. By immigration, people can give themselves an opportunity but the opportunities within the small island nations are very limited. Let me give you an example of the sort of thing that happens. There are often scholarships available for people to study overseas. Now let us take for example a government department which employs 2 statisticians, and they are both in their fifties with a career expectation of 10 years. If you send a young student overseas to study, they come back to their home country and there is no job for a statistician in their country. So they leave. But 10 years later, there might be a job for a statistician, or a doctor, or any other profession. It's very difficult to match human resources development with needs at the time. And this is also contributing to poverty of opportunity. Many people have commented that the kind of education that the people are getting in the Pacific Region is inappropriate for the needs. There is less investment in technical and vocational education. More investment in academic education, which is not necessarily needed. Students at high school are learning history, art and literature and language, which are very important for personal development. They're not learning how to fix cars, they're not learning how to wire up electricity in houses, they're not learning how to recycle garbage. Poverty of opportunity is partly mismatch of labour force to employment opportunities too. I could go on a great length but there are a couple of examples to help explain what I mean.

MR. WAKI (UNFPA):
I would also like to ask Professor Uchijima about the productivity of vegetation and the question of humid climatic feature. When I think of all civilizations—like the civilization in Indus, Mesopotamia or Egypt, or even in Yellow River in China—I assume that these civilizations had a surplus in production to enable the realization of such civilization and culture. And I'm wondering why these civilizations occurred in the areas that are on the borderline—not in the humid area but in sub-humid or close to sub-arid areas. Is it due to irrigation or some crop like wheat at reasonably high productivity in sub-humid areas? This is a bit of a difficult question, but is there any hope for increasing productivity in sub-humid areas?

DR. UCHIJIMA:
Let's look at the four civilizations, Mesopotamia, Indus, Egypt and Yellow River. Let us assume that the climate has not changed since 4,000 years ago and when we look at the sub-humid and sub-arid areas today, we go back and look at the bases of civilization. These are sub-humid and sub-arid areas. There they produce surplus production, and that is where civilization and culture actually developed. That is what created the four civilizations of the world. Well let's look at these areas today. Compared to humid areas, these are sort of sub-arid areas. And it is far removed from the sub-tropical areas, and at the same time far from removed from tropical transmitted diseases. That is one of the reasons. The other reason is that they are in the surrounding areas of the big areas. Of course, there was not much irrigation but they were able to carry out this irrigation. And in the subtropical area including Japan, solar energy was abundant here compared to the monsoon areas. Including China, the Yangtze River, and over to the Japanese archipelago, we will see that in this middle latitude, there is less solar radiation. So it is rather dry and also dry area with quite a bit of solar energy in the areas where civilization developed. It was really protected and irrigation developed in these areas. I think this is the reason why civilization was generated in these four areas. Now why did the four civilizations disappear? Excluding China, why were they facing such great danger? That is because of surplus agriculture and salinisation. A lot of agriculture was made impossible except in Egypt. They had actually quite a bit of flooding and until the Aswan High Dam was built, there was no collection of salt. But with the dam construction, there has been an accumulation of salt as well as degradation of the soil in the lower stream region of Egypt. As for the reason why the four civilizations developed in these areas, the climate was rather arid and that actually gave rise to solar radiation which is at the basis of agricultural production. And also water resources added to the generation of civilization, also contributing to high agricultural production. And with this high agricultural production, civilization developed in these areas. Having said that, however, excluding the Egyptian civilization, the base of production, the fertility of high plateau areas were quite damaged with the accumulation of salt and the damage still remains today.

MR. YATSU, MP (JAPAN):
I have a question for Dr. Uchijima. Water in agriculture and industry, and drinking water all included. In Turkey and Syria, by Tigris and Euphrates—they may be called "international rivers." And Turkey has actually created dam to supply. As a result, supply of water to Syria is very limited and is giving negative impact on agriculture in Syria. On the other hand, in Asia, Mekong River flows out of China and cross a number of countries in Asia. I don't know if we can classify them as international rivers, but how can we manage water resources? I think we have to create some sort of treaty or agreement for rivers that run across borders and to prevent future problems. What do you think, Dr. Uchijima?

DR. UCHIJIMA:
For international rivers, for example, the Rhine and the Danube, there are quite a lot of international treaties regarding these rivers in Europe. And those also for the prevention of river pollution, a quite a bit of agreements have been put in place. But the names you have mentioned—the Euphrates and Tigris, and also the Nile River and the Mekong River—the rivers in Southeast Asia and onto China—these rivers in the future—I think Africa also we must not forget because there are rivers in Africa too that we must not neglect... But in these areas, for the development of each of these nations, if they actually cut the water upstream, this is more of a serious problem and that would lead to international conflict more than the petro oil issue. And therefore, these countries that have rivers, they really must limit the use of water by one country and make a fair rule to use and manage international rivers efficiently. And in fact, I think the most important thing in all of this is rivers. Water is really a formation of environmental factor. And the second issue is that it also contributes to the life of mankind, and also food production. Water is a very important resource for this. And thirdly, rivers themselves, we must no forget, are important for a lot of living creatures. They become the habitat for living creatures. Now we must therefore look at these three important factors and come out with measures where we can satisfactorily use water efficiently. We need a long term strategy to do this. Mankind has actually been using rivers just as source of water. But we must look at water as environmental factor and also as a water resource, and also as an important habitat for different living creatures. This is the way we must look at water, and not only as a water resource. We live on this mother earth, within this global ecosystem in which water supports our existence. So we must look at these three factors in a balanced way and use water in a good way where we can maintain water. This is a long term issue and we must also establish out water policies in a very rational way as they will become very important for each of our governments to think about.

Session II

"Food Security and Population Issues"

—Environment and Sustainability—

Session 2

Chairperson:
Mr. Lakshman Singh, MP (India)

"Sustainable Food Security for All"

Dr. Vo-Tong XUAN
Professor of Agronomy
President, Angiang University, Vietnam

1. Contrasting scenes

As the new millennium ushers in, the world still face an astonishing contrast: while about 800 million people go to bed hungry many countries found their surpluses of food hard to put away. Particularly in Vietnam's Mekong Delta where 17 million persons are producing 17 million metric tons of rice last year. Vietnamese rice farmers are complaining that the government could not help them selling the stuff that they have been asked to produce by all means. People in Africa, South Asia, Indonesia, Philippines, etc. are suffering from the state of food deficiency despite the fact that international donor agencies have been investing billions and billions of dollars for food security. Why have we made so little progress? What did we do wrong? Shy haven't we solved the problem? How committed are we to ending hunger? What are alternatives future for food security? These are difficult questions that all stakeholders in the food web must seriously ask. The legislator, in particular, who are responsible in appropriating the budget for research and development at home and abroad, may be keen to look into these problems, In this paper, I'll try to put the world food security in its actual aspects to see how it is affected by various forces so far, and based on the Vietnamese experiences, I'.. propose the measures that may assure the sustainability of food security.

Looking back 15 years before, Vietnam was begging food aids.

2. The forces that shape the sustainability of food security:

2.1- Population[1]

Never before in human history has our planet been so densely populated as today: 6 billion people now live on earth and, even though birthrates are decreasing in most countries, about 88 million will be added to our numbers every year, 98% of them in developing countries.[2] Those of us born before 1950 are the first generation in human history to witness a doubling of world population.

While some of the developing countries are steadily moving toward lower birth and death rates, others – mainly those with high levels of poverty and limited social and economic progress for women – are experiencing constant birth rates at a high level. In the aggregate, the population of the developing countries – 80 percent of the global total – continues to increase at record levels : With an increase of 56 million per year, Asia has the highest absolute growth; with 2.8% population growth per year,

[1] Excerpt from http://www.foundation.novartis.com/food_security_population.htm
[2] World Bank, World Development Index Report 2001

Africa has the steepest rate.

World Population 1996, 2010 and 2025 (in 1,000)

Region	*Years*		
	1996	*2010*	*2025*
World	5,771,000	6,974,000	8,193,000
More developed	1,171,000	1,231,000	1,268,000
Less developed	4,600,000	5,743,000	6,925,000
·Africa	732,000	1,039,000	1,462,000
·Latin America	486,000	534,000	678,000
·Asia	3,375,000	4,110,000	4,772,000

Source: Population Reference Bureau (Ed.):
World Population Data Sheet 1996, Washington, D.C. 1996

Because nearly 40 percent of the people living in developing countries are younger than 15 years, i.e. still not in what the demographers call reproductive age, the high absolute population growth will continue on despite declining birthrates. The present international consensus is that in the next thirty years the wold population will swell to at least 8.2 billion.

For a small number of countries the challenges of population growth will be particularly daunting:

Selected Countries Ranked by Population Size: 1996,2010 and 2025 (in thousands)

Country	*1996*	*2010*	*2025*
China	1,217,616	1,387,000	8,193,000
India	949,592	1,231,000	1,268,000
Indonesia	201,425	5,743,000	6,925,000
Nigeria	103,912	1,039,000	1,462,000
Pakistan	133,516	584,000	678,000
Bangladesh	119,823	4,110,000	4,772,000

Source: Population Reference Bureau (Ed.):
World Population Data Sheet 1996, Washington D.C. 1996

Already the fact that a significantly higher number of human beings will have to be provided with food in adequate quantity and quality poses a number of political, economic, social, ecological and technological problems, Two salient features of population growth will make it particularly difficult to achieve future successes on the food security front:

- The world is becoming more urbanized, and
- The world is becoming more polarized, i.e. while the number of people in the low-income groups is growing faster than world population in general, the share of income of the rich has been rising significantly.

2.1.1. Urban population growth

The world, in particular the developing world, is in the midst of an unprecedented urban transition. Within the next decade, more than half of the world's population, an estimated 3.3 billion, will be

living in urban areas.[3] As recently as 1975, just over one-third of the world's population lived in urban areas; by 2025, only 50 years later, it will be almost two-thirds.

Total Population Growth and Urban Population Growth 1950 –2025 (in millions)

Year	*Total Population*		*Urban Population*	
	World	*Developing countries*	*World*	*Developing Countries*
1950	2,516	1,683	783 (31%)	295 (18%)
1970	3,697	2,648	1,353 (37%)	676 (26%)
1990	5,295	4,084	2,274 (43%)	1,435 (35%)
2000	6,228	4,950	2,926 (47%)	2,022 (41%)
2025	8,193	6,925	5,065 (62%)	4,025 (58%)

Source: UN: World Population Prospects, The 1992 Revision, p. 284ff; for the year 2025: Population Reference Bureau 1996; for Urban Population : UN: World Urbanization Prospects, The 1994 Revision, p. 86f

The megacities of the future are increasingly to be found in developing countries, and will confront them with social and environmental problems of unprecedented magnitude.

Population in Cities with More than 1 Million Residents, by Region 1950–2015

Total Population (in Millions) of All Cities with More than 1 Million Residents

Region	*1950*	*1970*	*1990*	*2015*
Africa	3	16	59	225
Latin America	17	57	118	225
Asia	58	168	359	903
North America	40	78	105	148
Europe	73	116	141	156

Source: UN Population Division: World Population Prospects; 1994 Revision, New York 1995, p. 14ff

In Practically no city in poor countries have public investments in new housing, effluent disposal, highways, transportation, and other infrastructure basics of government services kept pace with the urban growth rate of the past three decades. Some one billion people already live cooped up in slums; at least 220 million urban dwellers lack access to clean drinking water; more than 420 million do not have access to the simplest latrines and other bare essentials of a decent standard of living. This has notable consequences for the quality of life and physical security of city dwellers.

As it also does for food security: Urban populations are not able to feed themselves by subsistence food production, and their eating patterns differ from those of rural folk. The amount of high-value, transportable, and storable grain (such as rice and wheat), animal protein, and vegetables in their diets is higher, with a corresponding decrease in the proportion of traditional foodstuffs.

As incomes rise for some urban professional groups – this is expected to be the case particularly in the

[3] United Nations Population Division: World Urbanization Prospects: the 1994 Revision, New York 1995, p.87

industrializing Asian countries – people move up the food chain, i.e. consume more livestock products, the production of which either requires more grain or absorbs arable land.

A comparison of different countries shows the impact on food demand:

Annual Grain Use and Consumption of Livestock Products in Selected Countries, 1990 (in kg per capita)

Country	*Grain*	*Beef*	*Pork*	*Poultry*	*Milk*	*Eggs*
United States	800	42	28	44	271	16
Italy	400	16	20	19	182	12
China	300	1	21	3	4	7
India	200	–	0.4	0.4	31	13

Source: Brown L.: Who will feed China? Wake-up Call for a Small Planet. W.W. Norton, New York 1995, p.45

Already today's 400 million or so subsistence farmers cannot feed the urban population of 1.5 billion: the 800 million subsistence farmers cannot feed the urban population of 1.5 billion: the 800 million subsistence farmers of the year 2025 will not possibly be able to feed 4 billion city dwellers. This means that future food production will come from a dualistic agriculture. The subsistence sector will continue to support those living in the backward areas, while modern agriculture and intensified production will have to supply the urban dwellers.

While cities grow and a part of the urban population enjoys increased income, overall the world Is becoming more polarized and poorer as the lower-income classes grow faster than the total population:

2.1.2. The world is growing poorer

Poverty reduction has been the top priority of development endeavors over many years. Yet, despite the fact that significant progress has been made in improving living standards in almost all developing countries, more than 1.3 billion people in the developing world still struggle to survive o less than a dollar a day: they live in *absolute* poverty. Every year nearly 8 million children die from diseases linked to dirty water and air pollution, 50 million children are mentally or physically damaged because of inadequate nutrition, and 130 million children-80 percent of them girls-are denied the chance to go to school. The shocking fact is that a child born in Sub-Saharan Africa is still more likely to be malnourished than to go to primary school and is as likely to die before the age of five as to enter secondary school.

Despite substantial increases in the income of the upper and, in part, the middle classes in nearly every developing country. The number of people living in poverty is expected to rise at an above-average rate. Of the world's 6 billion people, 1.2 billion live on less than a dollar a day.[4] Up to now, poverty has been mainly a rural phenomenon, attributable in part to a vicious circle: a lot of today's degradation of agricultural resources is poverty-related – and degraded environmental resources contribute to the perpetuation of poverty. Yet, although poverty will continue to characterize the rural landscape, projections show that the number of urban poor will overtake the number in rural areas by early next century.

Relative poverty has also increased. Over the past 15 years the world has seen spectacular economic

[4] World Bank, WDI 2001,

advances for some countries – and unprecedented decline for others. Disparities have grown between rich and poor countries, and within societies as well. To repeat: Today the world is more polarized than ever before in human history. While absolute poverty has direct negative implications for human development, increasing economic disparities against a background of widespread poverty put the social fabric at risk.

2.2- Economic forces

2.2.1. *Globalization:* while globalization will potentially bring new opportunities to the developing countries, it will be accompanied by new challenges that in the end the poor people will be victims if their respective governments do not invest seriously in human resources and infrastructures.

2.2.2. *Resources needed by the poor to escape poverty:* the poor are in desperate need of **production means** (land, farm equipment, fertilizers and pesticides, water...) and the skills of how to integrate the various natural resources at the level of their human capability. The reality in many poor countries is that the people who provide the resources often operate separately, thus causing more confusion to the poor. For example the agricultural extension agent provides technology to the poor farmer but he does not have the money to help that farmer buying the resources needed to apply that technology, while the agricultural credit agent gives loan without much technological guidance attached. Therefore the poor farmers may either not using the technology, or spending the loan money ineffectively.

2.3- Technological and environmental

The trend threatening sustainable agricultural development and hence food security has to do with the widespread effects of human activities on the environment: On the global level, major key indicators show that the physical condition of the earth is deterioration, i.e. the earth is getting warmer (the 10 warmest years in the last 130 have all been in the 1980s and 1990s; of those 10, the three warmest were in the 1990s, with 1995 the record year to date)[5]. The deforestation[6] of the planet continues unabated, reducing the capacity of soils and vegetation to absorb and store water.
Soil erosion by water and wind due to inappropriate agricultural techniques as well as overuse of scarce resources[7], particularly overuse of water resources[8], make every effort to improve food security an even more difficult task. Water and wind erosion are the principal causes of degradation. Various sources suggest that 5 to 10 million hectares of land are being lost annually to severe degradation. The degradation of cropland appears to be most expensive in Africa, affecting 64 percent of the cropland area, compared with 51 percent in Latin America and 38 percent in Asia[9]. Declining yields or increasing input requirements will be the consequence.
A number of populous countries suffer particularly high losses. Each year Indonesia, for example, loses 20,000 hectares of cropland on Java alone, which is enough to supply rice to 378,000 people. China, the most populous country in the world, continues to be under heavy land pressure, with at least uncertain consequences for national food self-sufficiency.

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[5] Brown L.R./Flavin Ch./Kane H.: Vital Signs 1996. The Trends That Are Shaping Our Future. World Watch Institute, W.W. Norton, New York 1996: also World Resources Institute/ United Nations Environment Programme / United Nations Development Programme/ World Bank: World Resources 1996-97. A Guide to the Global Environment. The Urban Environment. Exford University Press, New York 1996.

[6] Acharya A.: Forest Loss Continues, In: Brown L.R. / Flavin Ch./ Kane H.: op.cit., p.122ff.

[7] International Soil Conservation Organization: Precious Earth. Berne (Center for Development and Environment, Institute of Geopraphy, University of Berne), July 1996

[8] Engelmann R. / Leroy P.: Sustaining Water-Population and the Future of Renewable Water Supplies. Population Action International, Washington, D.C. 1993.

[9] Scherr S.J./ Yadav S.: Land Degradation in the Developing World: Implications for Food, Agriculture, and the Environment to 2020. IFPRI Discussion Paper No.14, Washington, D.C. 1996., p.5.

Loss of Arable Land in China, 1987–92

Sources of Loss	*Area Lost (1,000ha)*	*Share of China's Cropland (in %)*
National Capital Construction	508	0.4
Township and village Construction	240	0.2
Peasant House Building	184	0.1
Forest Expansion	833	0.6
Pasture Expansion	552	0.4
Unexplained Losses	4,239	3.3
Total Losses	**6,556**	**5.0**

Source: Gardner G.: Shrinking Fields: Cropland Loss in a World of Eight Billion Worldwatch Paper No.131, Washington, D.C. 1996, p.15

Against this background, technologies have been generated by various institutions both international and national in order to cope with the trends. Often the research budget is provided by donor agencies. The international agricultural research institutions are supported by the CGIAR group to realize the noble mission: *food security, Poverty alleviation and sustainable environment.* The national agricultural research organizations in developing countries are supported partly by their national budget and partly by bilateral aid money. The tendency in technology development can be seen along these lines:

2.3.1. *Agroecological approach:* a natural resource management approach that is aimed at harmonizing both the natural and human resources so that poor farmers will be able to optimize their given environment to produce needed land use products that would satisfy their food and shelter while increasing their income without much destruction of the environment.

2.3.2. *Conventional approach:* this calls for the full use of biological resources by conventional methods of improvement (conventional plant breeding, use of pesticides, inorganic fertilizers, etc.)
2.3.3. *Biotechnological approaches:* using modern methods in genetic improvement (molecular biology, genetic engineering) new species will be created to gain higher production.

2.3.4. *Water resources*[11]*:* Water is truly the most limiting natural resource. Competition among agriculture, industry and cities for limited water supplies is already constraining development efforts in many countries. As populations expand and economies grow, the competition for limited supplies will intensify and so will conflicts among water users.

Despite water shortages water shortages, misuse of water is widespread. Small communities and large cities, farmers and industries, developing countries and industrialized economies are all mismanaging water resources. Surface water quality is deteriorating in key basins from urban and industrial wastes. Groundwater is polluted from surface sources and irreversibly damaged by the intrusion of salt water. Overexploited aquifers are losing their capacity to hold water and lands are subsiding. Cities are unable to provide adequate drinking-water and sanitation facilities. Water logging and salinization are diminishing the productivity of irrigated lands. Decreasing water flows are reducing hydroelectric power generation, pollution assimilation and fish and wildlife habitats.

At first glance, most of these water problems do not appear to be directly related to the agricultural

[11] Excerpt from FAO, The State of Food and Agriculture, 1993-2000.

sector. Yet, by far the largest demand for the world's water comes from agriculture. More than two-thirds of the water withdrawn from the earth's rivers lakes and aquifers is used for irrigation. As competition, conflicts, shortages, waste, overuse and degradation of water resources grow, policy-makers look increasingly to agriculture as the system's safety valve.

Agriculture is not only the world's largest water user in terms of volume, it is also a relatively low-efficiency and highly subsidized water user. These facts are forcing governments and donors to rethink the economic, social and environmental implications of large publicly funded and operated irrigation projects. In the past, domestic spending for irrigation dominated agricultural budgets in countries throughout the world. In China, Pakistan and Indonesia, irrigation has absorbed over half of agricultural investment. In Vietnam, more than 70 percent of agricultural investment went to irrigation. In India, about 30 percent of all public investment has gone into irrigation. A significant portion of international development assistance has also been used to establish irrigation systems. Irrigation received nearly 30 percent of World Bank agricultural lending during the 1980s. Spending commitments for irrigation by all aid agencies exceeded $2 billion per year in the past decade.

Despite these huge investments and subsidies, irrigation performance indicators are falling short of expectations for yield increases, area irrigated and technical efficiency in water use. As much as 60 percent of the water diverted or pumped for irrigation is wasted.

Today, agriculture is often unable to compete economically for scarce water. Cities and industries can afford to pay more for water and earn a higher economic rate of return from a unit of water than does agriculture. (For economist, water flows uphill to money.) For the first time in many countries, agriculture is being obliged to give up water for higher-value uses in cities and industries. Irrigators in some areas are now asked to pay for the water they receive, including the full cost of water delivery. In other areas, new regulations require farmers to pay for polluting streams, lakes and aquifers.

The irony is that irrigated agriculture is expected to produce much more in the future while using less water than it uses today. At present, 2.4 billion people depend on irrigated agriculture for jobs, food and income (some 55 percent of all wheat and rice output is irrigated). Over the next 30 years, an estimated 80 percent of the additional food supplies required to feed the world will depend on irrigation.

These development are placing enormous pressure on agricultural policy makers and farmers. Throughout the world, governments assume the prime responsibility for enfsuring food security and, because food depends increasingly on irrigation, food security is closely liked with water security. Between 30 and 40 percent of the world's food comes from irrigated 16 percent of the total cultivated land; around one-fifth of the total value of fish production comes from freshwater aquaculture; and current global livestock drinking-water requirements are 60 billion litres per day (forecasts estimate an increase of 0.4 billion litres per year). Food security in the next century will be closely allied to success in irrigation.

Irrigation projects can contribute greatly to increased incomes and agricultural production as compared with rain-fed agriculture. In addition, irrigation is more reliable and allows for a wider and more diversified choice of cropping patterns as well as the production of higher-value crops, Irrigation is a key component of the technical package needed to achieve productivity gains. In the future, as high levels of costly inputs are added to crop land to sustain yield increases, the security and efficiency of irrigated production will become even more important to world farming. Water will no longer be plentiful and cheap. It will be scarce, expensive to develop and maintain and valuable in use. The prospect of high-ist water may at first seem to be another problem looming for low-income economies. However, the high cost will be an incentive to use water more efficiently. The single most important factor limiting the adoption of proven irrigation and drainage technology is the low cost of water.

Moreover, if farmers have opportunities for higher-value uses and can make profits, both governments and farmers will invest in irrigation.

This water dilemma – to produce more in a sustainable way with less water- points to the need for demand management mechanisms to reallocate existing supplies, encourage more efficient use and promote more equitable access. Policy-makers need to establish a structure of incentives, regulations, permits, restrictions and penalties that will help guide, influence and coordinate how people use water while encouraging innovations in water-saving technologies.

2.4- Sociopolitical forces

Food security depends greatly on the political will of the country's leaders. If the leaders place public interest above their selfish power, perhaps the direction for agricultural development in the country will assure its rural development, hence the state of food security and poverty alleviation. With god political will, other detrimental forms to development, i.e. corruption, will be curbed to give way to providing the people with favorable conditions for the production of public goods including food.

3. Sustainable food security

Food security thus has three dimensions:[12]

- Availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports;
- Access by households and individuals to appropriate foods for a nutritious diet; and
- Optimal uptake of nourishment thanks to a sustaining diet, clean water and adequate sanitation, together with health care.

Food security can be realized by first the political will of the government before other conditions take place. The case of Vietnam is worth to consider: Before the so called "doi moi" policy was promulgated bye the governmetn in 1986, Vietnam was still asking food aid. Most people in the contry tried their best to produce but the socio-economic policy at that time prevented all the incentives of the people. When the government switched to "doi moi," the same farmers, the same land throughout the country could produce food to the best of their incentives with the back up of the technological forces in the country, immediately food surpluses were realized in one year.

I believe that if the governments in the world, particularly the food-deficit ones, could try to place the public interest above all, and at the same time the agricultural research and development institutions in the world (both national and international) set their priorities to serve the poor farmers instead of to satisfying their scientific curiosity and comfort, the really sustainable food security in the world could be realized. The different actors in the food web, from the donor agencies to government staff, researchers, NGO workers, down to farmers should work in a mode of harmonious division of responsibility, NOT anymore in the independent mode as before. By so doing, the prospect of ending hunger in the world may be near.

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[12] Discussion draft of the US Government for the June 3 Forum on the World Food Summit.: The U.S. Contribution to World Food Security. Washington, D.C. June 1996.

"Population and Food Security: Early Research Results from the Philippines"

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SETTING THE PARAMETERS

The most central issues of development revolve around the interface between population and resources, and among these particularly the most basic of needs – food and water. The problems engendered by food security questions (and in this context we include water security, although this paper will not deal specifically with that question[7]) are multi-dimensional. They involve all the socio-economic questions of supply, demand, production and distribution.

Cross-cutting all of these are demographic issues that are exacerbated, or mitigated by land-tenure systems, and the availability of land for farming. These issues also have major implications for policy-makers, and for politicians. They must address problems relating to the equitable distribution of land resources. In turn these must vie in priority with factors affecting production and distribution efficiencies. At the same time politicians face questions about the growth and geographical profiles of population and the most effective use of human capital.

To address these questions, this paper uses Philippines' data drawn from a field-study that is part of a large and growing cross-national research programme sponsored by the United Nations' Food and Agricultural Organisation (FAO), and emanating from the FAO's 1996 Food Summit (Rome). This programme is titled: *"Inter-relations between Population Dynamics, Land Resources and Adapting Land Tenure Systems"*. Its inspiration comes from a cross-national technical paper, prepared specially for FAO's Summit Conference (Collomb 1996, 1997a, 1997b), and using secondary data. This programme is centered on large, rapidly growing, grain-dependent, lower income countries that cannot use imports to substitute for local grain production. A later stage of the research will look at local area case-studies, the results of which we do not cite here. These results build, however, on the work of Gultiano and Urich (2000) on a Bohol case-study that provides some of the interpretations we make in the present paper.

Collomb's paper not only covered levels of nutrition — the factor that might be seen as the outcome of processes and policies of food security as affected by all the other intervening factors – but he also reviewed all the other factors, demographic, land tenure (at a very macro-level), political (eg civil unrest or

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[7] Water security has many ramifications even in the present context, including the need for potable drinking water, the need to irrigate crops, the needs for animals and the needs of food processing plants. Another issue, of direct relevance in the Philippines' case study, is that of competing needs between agriculture and urban water supplies. One of the case-study areas being analysed in detail is the water catchment zone for Cebu City, the second largest urban area in the Philippines. This is an area of marked local relief, containing traditional farming communities (now often reliant on off-farm income, but still farming very steep slopes with methods that encourage soil depletion), rural-urban squatter groups, and sub-divisions to house well-off urbanites. A critical issue is the depletion of bush and forest reserves.

wars that might affect tenure and production), production etc. Three major triangulated points critical to the present paper emerged from his analysis:

1. A central point is the rate of involvement of the population in production, both in terms of their participation in the agricultural workforce and their share of the profits or benefits accruing from this work. The key to this is, in turn, —
2. Security of land tenure, and together both of these points are related to –
3. Increases (or decreases) in productivity and production.

Mitigating these, however, are the strategies by which systems of land tenure can change, and by which any reforms are transmitted to the population. Because this last point is critical for the population-development interface, we address it in further detail below. We will cover a range of demographic factors that are important in their own right, but also because they are linked intimately to other aspects of rural development.

Basic to this is the argument that land reform *per se*, without a slew of related policies in fields as wide apart as rural credit and education, will not necessarily resolve the issues we have noted above. What one might call the capitalisation of intellectual property is central to successful land reform, and thus to increases in production. This capitalisation covers far more than basic education, but also involves, *inter alia*, an increasing skill base in the farming population, as well as the generation of human capital necessary for those who migrate away from agricultural zones to achieve success in other sectors of the economy. All these entail population and development questions to which we will return below.

Firstly, however, we must note that we must enter two caveats. We are not dealing here with problems of food distribution. These are clearly important factors for food security, and have major political and policy implications, but they are beyond the scope of our paper. Underlying our paper are environmental issues and agronomic questions relating to production. We will touch on these where appropriate, but this will be incidental to, rather than central to the themes on which we will focus.

POPULATION AND RURAL DEVELOPMENT

In a note presented in March 2001 to the United Nations' Commission on Population and Development, an international NGO CICRED[8] (2001) has argued that:

> The inter-relation between population, environment and development is the major substantive theme at the 34th session of the UN Commission on Population and Development. The *Millennium* Report of the Secretary General of the United Nations tackles this issue by reporting for example that due to the lack of resources to import the food required for their growing populations, many developing countries will have to increase considerably the productivity of their land, their water and their human resources. This is possible, but, in view of the priority generally given to economic development, there is a danger of shifting unduly the costs of the efforts on to people and the environment, particularly in rural zones where the majority of the population continues to live. If the costs exceed the absorptive capacities of either the population or the environment, the development goals can be at risk of not being achieved and the stability of societies threatened, in particular through unmanageable population movements.

This comment sets the themes to be addressed on our paper.

In assessing the relations outlined in the quotation above population factors can be viewed at both the macro- and micro-level. At a macro-level the key issues for the present study are population size, density, growth and structure (eg by age and gender, labour force characteristics, and geographical distribution), and

[8] Committee for International Cooperation in national Research in Demography. It is a Paris-based NGO that coordinates 600+ centres worldwide. It is funded by various United Nations' agencies, by non-profit foundations and by various governments, notably the French (in general), and Belgian and Netherlands (particularly for country studies in the cross-national programme to which our paper refers).

at a micro-level family formation and structures, and the national and international mobility of family members.

Moreover, it is worth stressing that "population factors" include not only questions of size and growth, but also a number of other demographic variables, some already noted in the last paragraph of which the following are important for the present paper:

- age structure (a factor that is both a determinant and a consequence of other aspects of population change relevant to this present paper (see Gultiano & Urich 2000; Pool 2000);
- family formation (particularly fertility) and structure (eg how many children are there in a family; their birth order, often a factor of importance for inheritance and thus tenure; their place of residence) (see Estudillo *et al* 2000);
- migration (internal, as through urbanisation; international, as through workforce mobility);
- family mobility (who has moved where and what their links, as through remittances, are to the family of origin);
- labour force (participation in the workforce; employment/unemployment/hidden unemployment; occupation and industrial sector);
- education (level and duration);
- geographical distribution in general and arable density;
- geographical distribution locally, including degree of concentration or dispersion of dwellings, and distance to fields.

All of these have implications for land availability, now and into the future, for land reforms and for production per worker/hectare. To take a micro-level example, in January 2001 a land reform zone in northern Leyte, a sugar plantation was being redistributed to its previous workers. They were currently working cooperatively harvesting sugar, but were also changing to producing crops for subsistence or for the local market. But the new owners often have very large families, and clearly for the future this implies either extreme fragmentation or the out-migration of many family members to local urban areas, to Cebu or Manila, or to work overseas.

A more macro-level example comes from Africa, from the first results for Niger and Burkina Faso from the cross-national study of which the Philippines is a part. There, the programme has produced results that give a somewhat bleaker view of the relationship between population and food security than had been the case until then, and led to a re-examination of the fertility assumptions in population projections (CICRED, 2001).

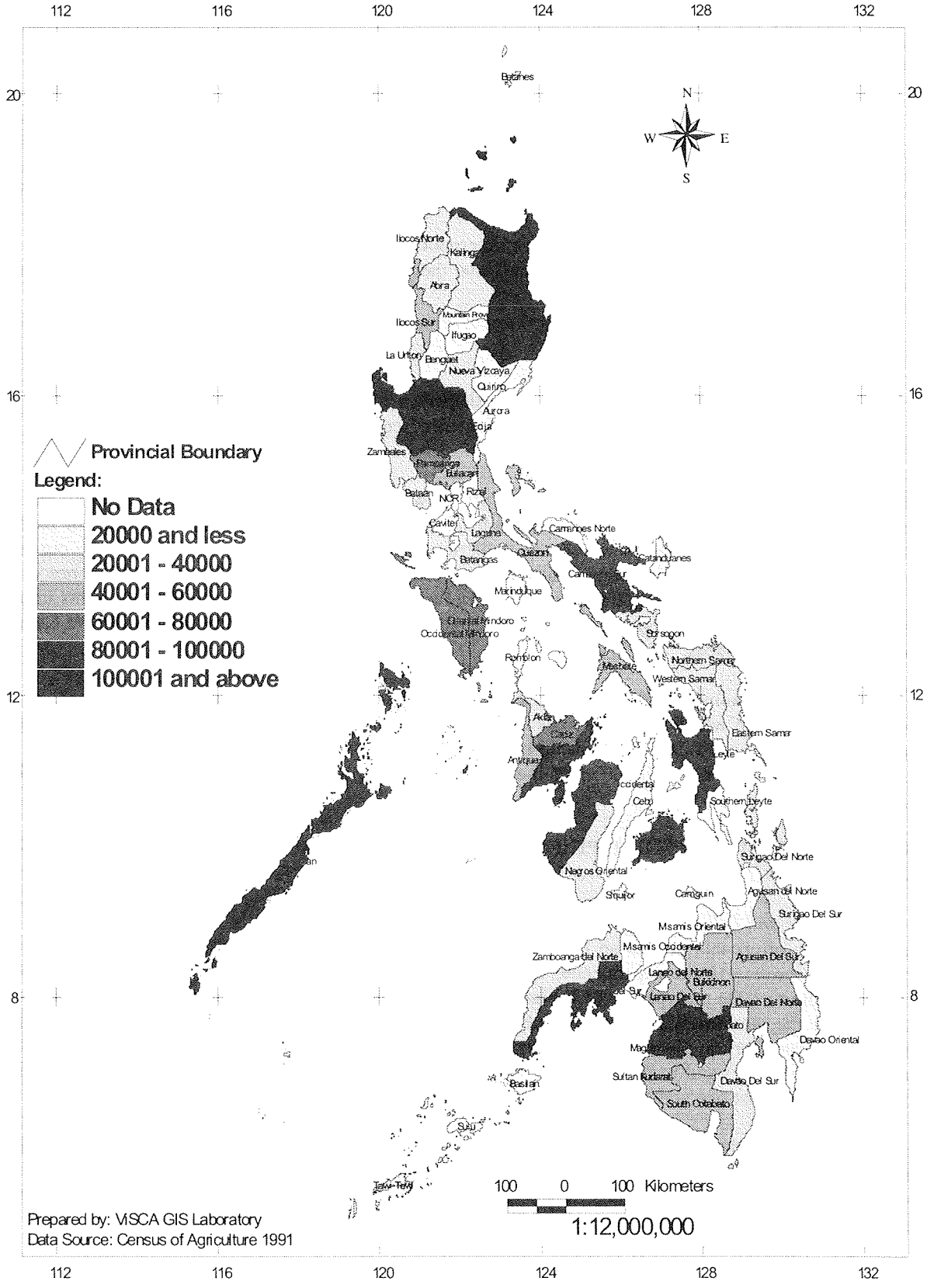
AN OVERVIEW OF THE PHILIPPINES — GRAIN DEPENDENCE, POPULATION AND LAND TENURE

Rice-dependence and Land Availability

The Philippines offers this project an interesting site to test the interactions between the aforementioned factors noted above. Grain dependence, mainly of rice and to a much lesser extent corn, has been common for most of the archipelago (see Figure 1). Rice predominates in the north most main island of Luzon and in the western and central islands of the central archipelago. In the southernmost island of Mindanao rice and corn production is important. Root crop production predominates in the eastern most islands (namely Samar) and in the far north. In both of these areas severe cyclonic weather is common which militates against rice and corn production.

For a short period in the 1960s and 1970s the Philippines was self sufficient in rice (Bouis 1993). This was attained, in part, by increasing yields in long-settled areas through the application of so-called green revolution technologies. Against this, however, a second major contributing factor to the attainment of rice self sufficiency was, however, the concomitant increase in the area planted to rice nationally. The

Figure 1: Map of the Philippines showing area of farms in hectares planted to rice by Province, 1991



'frontier' in Mindanao and its major rice producing potential were opened up through the late 1960s and 1970s (Bouis 1993). Since the imposition of Martial Law in the Philippines in 1973 the expansion of the agricultural frontier has to a large degree dissipated; but by then all the relatively productive land had already been opened up for agriculture. In the 1980s and 1990s the expansion of the agricultural frontier has been largely based on the settlement and clearing of public forestlands for subsistence-type agriculture (corn, rootcrops). These lands are typically sloping and of marginal sustainability (Cruz 1984; Cruz, Zosa-Feranil *et al* 1988; Cruz, Meyer *et al* 1992). Since the 1980s rice production has plateaued (Lampe 1993), and thus the country's ability to remain self sufficient in rice has waned. Imports have steadily increased, coming mainly from Viet Nam and Thailand. This bodes badly for the future for which increased production is needed (25% by 2020, Lampe 1993).

Demographic Constraints

The lack of self sufficiency in rice production has been exacerbated both by a closing of the settlement and rice growing frontier and, the continued rise in the country's demand for rice owing to population growth. Population growth in the Philippines continues to outpace that of many other Southeast Asian nations. While a transition to lower fertility is taking place, it is occurring more slowly than in the rest of the region. Preliminary results of the 2000 census pegged the population of the Philippines at 75.3 million. This is 6.7 million more than the count made in 1995. The annual growth rate in this intercensal period was 2.02 per cent; between 1990-95 it was 2.32 per cent, and between 1980-90 it was 2.35 per cent. Although the growth rate is on the decline, it still is high if compared with those of neighbours such as Indonesia (1.4 per cent), Thailand (1.0 per cent), and Singapore (1.5 per cent). It is almost on par with Malaysia (2.1 per cent), Vietnam (1.9 per cent) and Myanmar (1.8 per cent), but it must be noted that the Total Fertility Rates in these countries are lower than that of the Philippines. Moreover, because of the birth of large cohorts in the recent past, momentum growth (see below) plays on increasingly important role demographically.

In comparison with many Southeast Asian countries, the Philippines have lagged behind in fertility reduction. A TFR of 6.0 in 1973 was reduced to 5.1 in 1983, then to 4.1 in 1993, before further declining to 3.7 in 1998. In passing it is worth noting that the fertility declines have recently been more rapid than was projected in the 1980s, but the inexorable increases at teen and young adult ages due to momentum effects keep total growth rates at relatively high levels. Life expectancy is currently estimated at 66 and 69 years for males and females, respectively, and as recent improvements in survivorship around younger ages this has exacerbated the momentum.

As a result of these factors, the Philippine population remains relatively young: 38 per cent of its population is under 15 years of age and another 28 percent is between ages 15-29. Only Laos, Cambodia and East Timor, in all of Southeast Asia, have proportions of population under 15 years of age that are higher than is seen in the Philippines (44, 43 and 42 per cent, respectively).

The Philippines is well on its way into the demographic transition. However, before this end is reached, and before a complete transformation of the age structure brings the concerns of the elderly to the centre stage, the Philippines must first contend with the population's burgeoning number of young adults. Such is the legacy of sustained high fertility in the country's not-so-distant past. In sum, "the Philippines is in the midst of a 'youth bulge'", to use the phrase of Xenos and Raymundo (1999). Therefore, it has to deal with the various social and economic implications of this age-structural transition, that is having major impacts on rural development, migration and urbanisation.

Historical Perspective on Philippine Population

Before the census of 1903, only a sketchy outline of Philippine demographic history existed. The 1903 Census Report (United States Bureau of the Census, 1905) states that the earliest estimate of the Philippine population, made at the time of Legaspi's conquest of the Islands around 1570, was about half a million. By

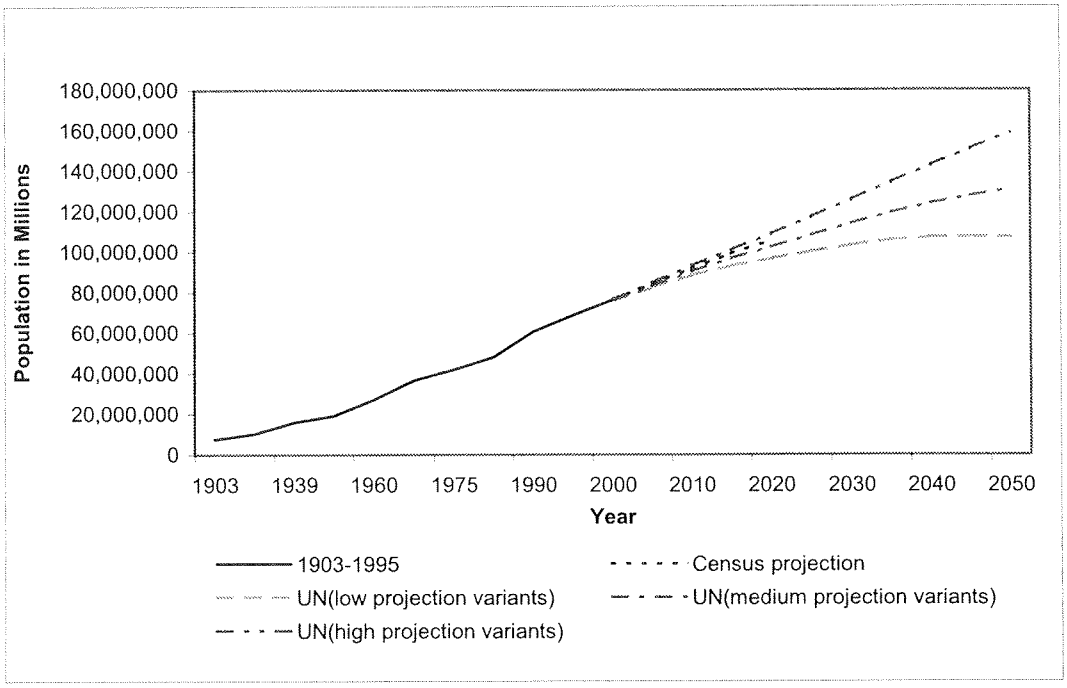
1591 there were some 668,000 people in the archipelago [1] (United States Bureau of the Census, 1905).[9]

Preliminary result of the 2000 Census gives a population count of about 75.3 million (NSO, 2000). This number is short of one million if compared with the NSO projected figure of 76.3 million (medium series)[10] for year 2000, but is close to the United Nations' low variant projection of 75.7 million. Considering, however, that fertility rates have not yet declined substantially to near-replacement level (TFR was 4.1 in 1993 and 3.7 in 1998) (NSO 1999), it seems likely that an upward revision of this preliminary figure is forthcoming.

National Trends to 2050

Figure 2 provides a graphical representation of the growth of the Philippine population throughout the 20th century and, as projected, into the first half of the 21st century. From the census figures it can be seen that annual growth rates stood at around 2 per cent in the first half of the century, then surged in the 1950s and reached a maximum of 3 per cent in the 1960s (Figure 3). Thereafter, annual growth rates have been slowly declining.[11]

Figure 2: Growth of Philippine population 1903-2050



Three sets of population projections provide clues to the size of Philippine population in the next 20 to 50 years. According to the medium series of the NSO projections based on the 1995 census, Philippine population will reach 105.5 million by year 2020 (NSO 1999).[12] This means an addition of 36.9 million

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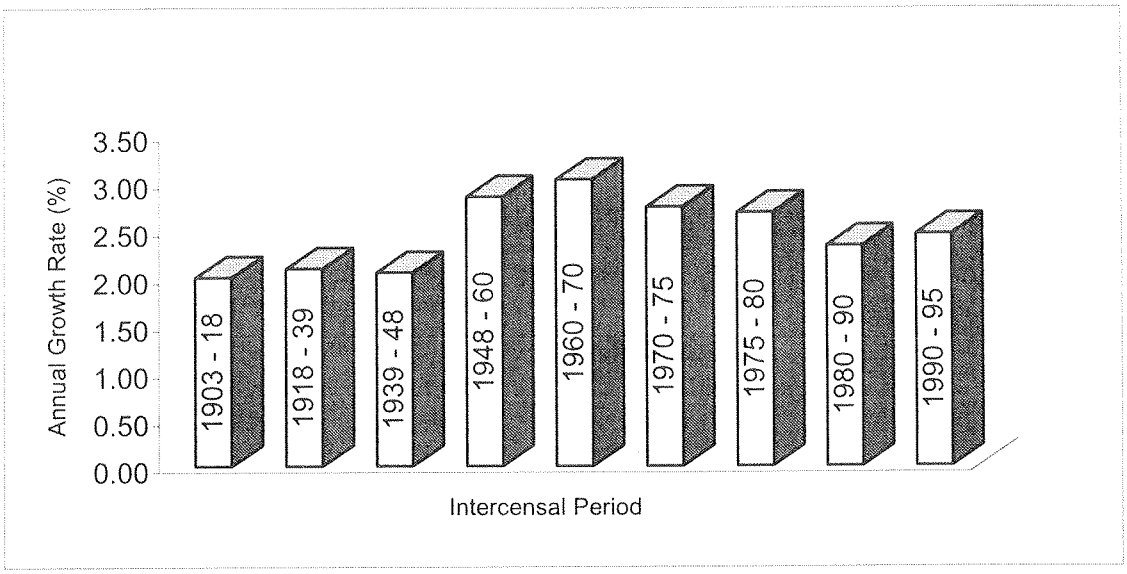
[10] Published data from NSO present population figures only from the medium series and exclude those from the low and high series.

[11] These growth rates were computed by means of the exponential function. Corresponding rates reported by the Census Office apparently using the geometric function are: 1960-70, 3.01 per cent; 1970-75, 2.78 per cent; 1975-80, 2.71 per cent; 1980-90, 2.35 per cent, and 1990-1995, 2.32.

[12] NSO assumed that NRR=1 for year 2010 for the low series, 2020 for the medium series and 2030 for the high series (National Statistics Office 1999).

people in the next two decades.

Figure 3: Annual growth rates from 1903 to 1995



If carried through to 2050, The UN projections predict population to reach 107.2 million based on the low fertility variant, about 52 million more (158.9 million) based on the high fertility variant, and approximately 24 million more (130.9 million) on the medium variant.

A third source of population projections is the Population Reference Bureau (PRB) (PRB 2000). The PRB reports Philippine population to be 80 million in 2000, ranking it as the 13th largest country in the world. In the context of Southeast Asia, it is second only to Indonesia (212 million), with Vietnam (79 million). By 2050, the PRB sees the Philippines as ranking 12th in the largest country category with a projected population of about 140 million.

If population is examined according to age composition, Table 2 demonstrates a clear albeit slow aging of the Philippine population. From the NSO medium series projections, the following salient points are evident: (1) the proportion of people under age 15 is declining, but their absolute number continues to rise until a reversal becomes noticeable after 2010; (2) the elderly population (age 60 and above) has doubled in number since the 1970s and could triple in this decade; by 2020 the elderly will constitute about 10 per cent of the country's population; (3) the proportion of young adults (age 15-29) has reached its peak and is now gradually on the decline, even as their numbers continue to rise; and (4) older adults (age 30-59) are continuing to increase in number and proportion.

A clearer indication of population aging from 1995 onwards can be gleaned from the population pyramids presented in Figure 4.

In the Philippine case, the main reason for the age-structural shifts observed in the aging of the population is the gradual decline in fertility. This is depicted by the shrinkage of the base of the population pyramid

Table 1: Population of the Philippines, 1903-2050

Year	Population Count			
	(NSO)			
1903	7,635,426			
1918	10,314,310			
1939	16,000,303			
1948	19,234,182			
1960	27,087,685			
1970	36,684,486			
1975	42,070,660			
1980	48,098,460			
1990	60,703,206			
1995	68,616,536			
	Population Projection			
	NSO	**United Nations**		
	(medium)	(low)	(medium)	(high)
2000	76,348,114	75,693,000	75,966,000	76,514,000
2005	84,241,341	82,525,000	83,450,000	84,846,000
2010	91,868,309	88,504,000	90,544,000	93,152,000
2015	99,015,818	92,994,000	96,732,000	100,989,000
2020	105,507,209	96,596,000	102,404,000	108,754,000
2025		100,153,000	108,251,000	117,066,000
2030		103,361,000	114,022,000	125,745,000
2035		105,804,000	119,313,000	134,393,000
2040		107,217,000	123,855,000	142,753,000
2045		107,604,000	127,635,000	150,825,000
2050		107,214,000	130,893,000	158,863,000

Table 2: Population by major age groups: Philippines, 1970-2020

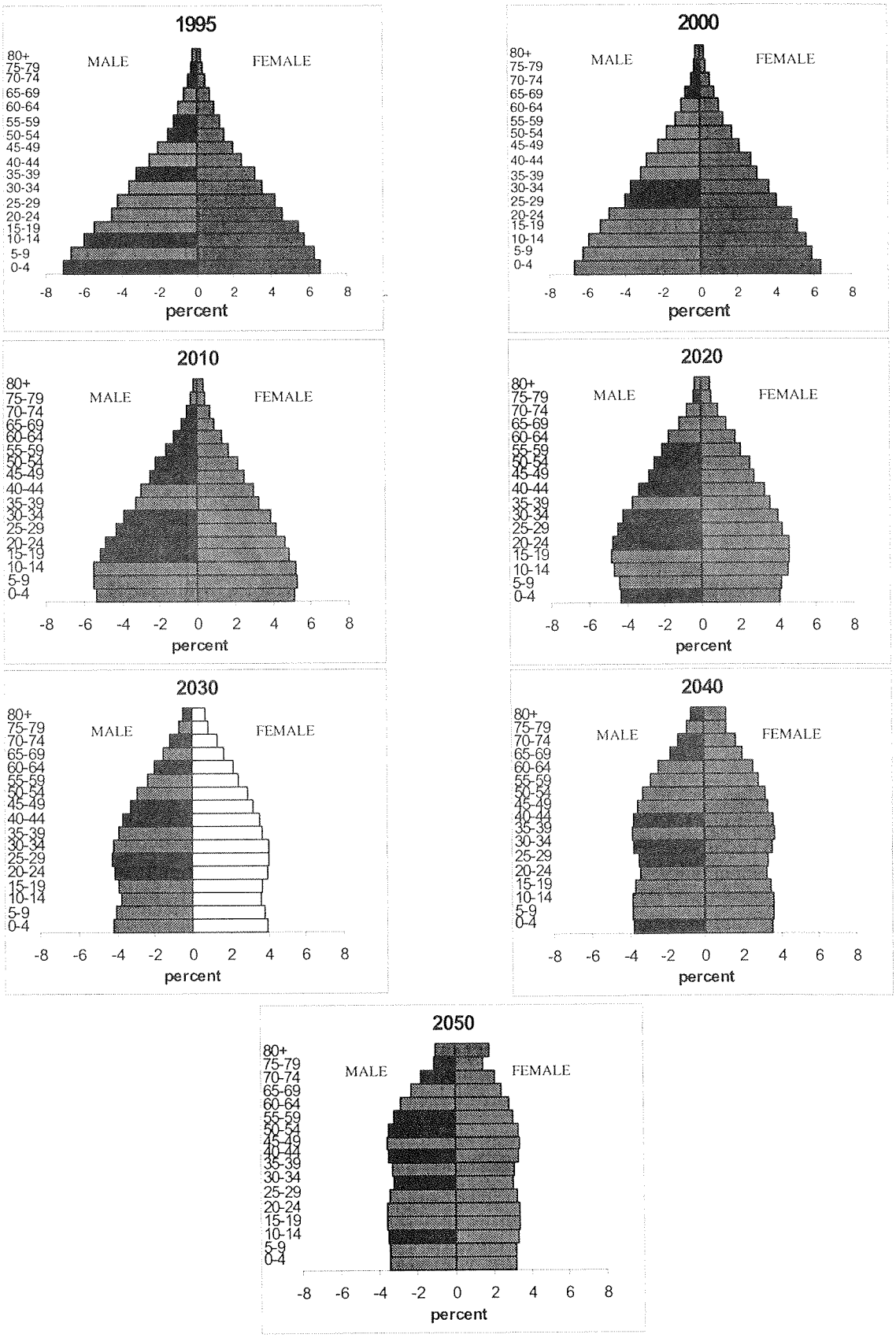
Age Group	1970[a]	1980[a]	1990[a]	2000[b]	2010[b]	2020[b]
	In Thousands					
0-14	16,757	20,221	23,994	27,600	28,580	27,661
15-29	9,691	13,698	17,354	21,425	25,724	28,099
30-59	8,560	11,637	16,023	22,678	30,489	38,994
60+	1,646	2,542	3,188	4,645	7,075	10,753
All ages	36,684[c]	48098	60,559	76,348	91,868	105,507
	In Per Cent					
0-14	45.7	42.0	39.6	36.1	31.1	26.2
15-29	26.4	28.5	28.7	28.1	28.0	26.6
30-59	23.4	24.2	26.4	29.7	33.2	37.0
60+	4.5	5.3	5.3	6.1	7.7	10.2

Census of Population and Housing, 1970, 1980, 1990.

b. National Statistics Office, 1995 Census-based National, Regional and Provincial Population Projections (medium series), Vol II, Table 2, p.32.

c. Includes about 30,000 individuals whose ages are unknown.

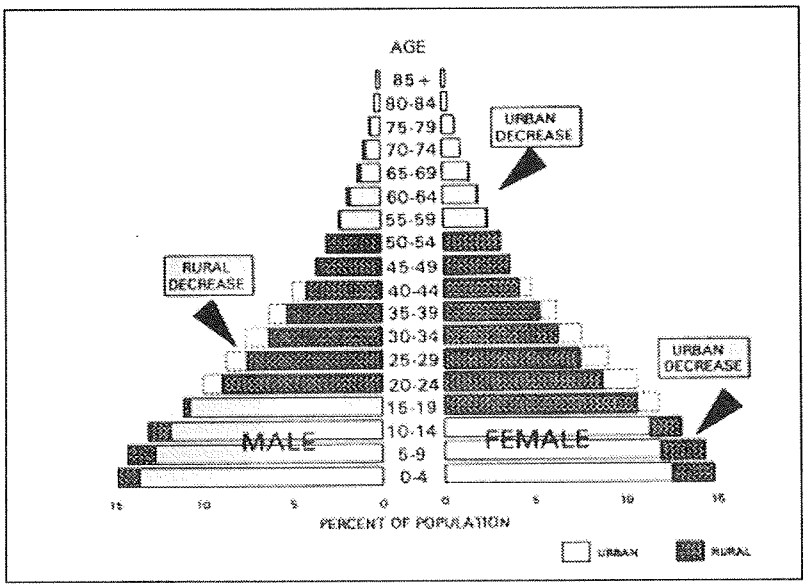
Figure 4: Population age structure: Philippines, 1995 – 2050
(United Nations projections – medium variant)



over time. In this regard, it is important to bear in mind that there exists an urban-rural differential in fertility. The 1998 National Demographic and Health Survey (1999), for example, reported the urban crude birth rate at 25.8 births per 1,000 population and the rural rate at 30.1.

The urban total fertility rate was 3.01 births while the rural TFR was 4.67. As explained by Flieger (1996), the age structure of the country "is moving in the direction where the age structure of the urban population has moved for some time". From Figure 5 it is apparent that the urban "excess" is predominantly female, specifically for age groups 15-29. This may suggest that rural-urban migration in the country is selective of young women (Gultiano & Urich 2000).[13]

Figure 5: Age-structural differences: urban and rural Philippines, 1990



Source: Flieger (1996) Figure 11, p.225

Population Migration

Population growth country-wide is primarily the result of natural increase. In the absence of data to prove otherwise, international migration has frequently been assumed to have no significant effect on the country's population growth (NSO 1997). The Philippines has sustained relatively high rates of growth because it also has sustained fairly high levels of fertility. While estimates of crude birth rates for 1980, 1990 and 2000 are available,[14] it is, however, more useful to discuss total fertility rates as these already take into account the age structure of the population (Flieger 1996).

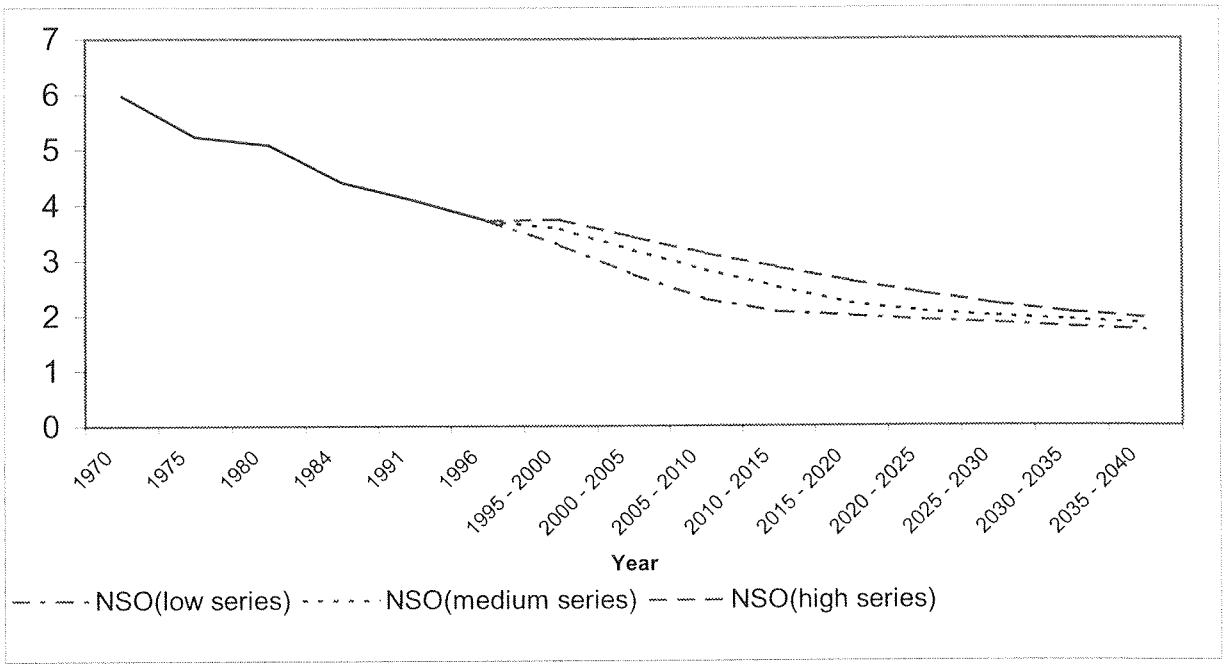
Between 1970 and 1996, the total fertility rate (TFR) went down from 5.97 to 3.73 births. With this relatively sluggish decline, the Philippines still has quite a way to go before attaining replacement level fertility. Under the assumption that the net reproduction rate (NRR) will equal 1.0 in year 2010 (rapid pace of fertility decline), the NSO has projected TFR to be 3.28 in 1995-2000, declining to 1.99 in 2015-2020

[13] This type of selectivity in migration has also been discussed in Gultiano and Urich (1999).

[14] Flieger (1996), for example, quotes a crude birth rate of 37.3 births per 1,000 population for 1980 and 28.1 or 28.8 (depending on the denominator one uses) for 1990. The Population Reference Bureau (2000) gives a crude birth rate of 29 for year 2000, and the UN estimate is 27.82 births per thousand population for 1995-2000.

and reducing further to 1.73 in 2035-2040. If NRR will equal unity in year 2020 (moderate pace of fertility decline), the corresponding projected TFRs are 3.58, 2.23 and 1.84, and if NRR is set to equal 1.0 in 2030 (slow pace of fertility decline), the TFRs will be 3.74, 2.62 and 1.95, respectively (Figure 6).[15]

Figure 6: Total Fertility Rates: Philippines, 1970 – 2040



Source:

1) 1970 – 1996 TFRs: National Statistics Office, Department of Health and Macro International, National Demographic and Health Survey 1998, Table 3.3 p. 36
2) 1995-2000 to 2035–2040 projected TFRs: National Statistics Office, 1995 Census–Based National and Regional Population Projections, Vol. I, Table 1-1, p. 6

With respect to mortality, Flieger (1996) had this to say:

> During the current century, the mortality level of the Philippines has declined substantially. Around 1950, Madigan (1966) and Lorimer (1966) pegged Philippine mortality at 20 deaths per 1,000 population annually, and the average life expectancy at birth at 43 years (both sexes combined). Some 40 years later, the annual number of deaths per 1,000 population had declined to less than eight, and the average life expectancy at birth had increased by more than 20 years.

According to the life table estimates of Flieger and colleagues, life expectancy at birth for males was 51.0 years in 1960 and had risen to 62.2 years in 1990; for females this had risen from 54.5 in 1960 to 67.4 in 1990 (Flieger *et al.* 1981; Flieger & Cabigon 1994). Using the 1990 estimates of Flieger and Cabigon (1994) as baseline values, and applying the UN's moderate increase in survivorship assumption, The National Statistics Office imputed male and female life expectancies at birth for the Philippines from 1990-2040 (medium series) as follows:

[15] The UN low variant projection estimates TFR to be 3.52 in 1995-2000, leveling off to 1.60 in 2015 all the way to 2040, while the high variant projections estimate TFR at 3.82 in 1995-2000 to 2.60 from 2015 to 2040.

Table 3: Projected life expectancy at birth, by sex: Philippines, 1990-2020 (NSO estimates)

	Male	Female
1990-1995	63.58	68.83
1995-2000	65.58	70.83
2000-2005	67.08	72.33
2005-2010	68.58	73.83
2010-2015	69.78	75.03
2015-2020	70.98	76.03
2020-2025	71.98	77.03
2025-2030	72.98	78.03
2030-2035	73.78	78.83
2035-2040	74.58	79.63

Figure 7 illustrates life expectancy trends from the 1960s to 2040. If compared with UN's projected figures, the NSO life expectancy estimates are lower by about one-half to one year for males, and higher by approximately half a year for females. In specific terms, the UN reports life expectancy for males to be 66.51 years for 1995-2000, 71.41 years for 2015-2020 and 75.01 years for 2035-2040; for females, the corresponding figures are 70.16, 75.56 and 79.16 years.

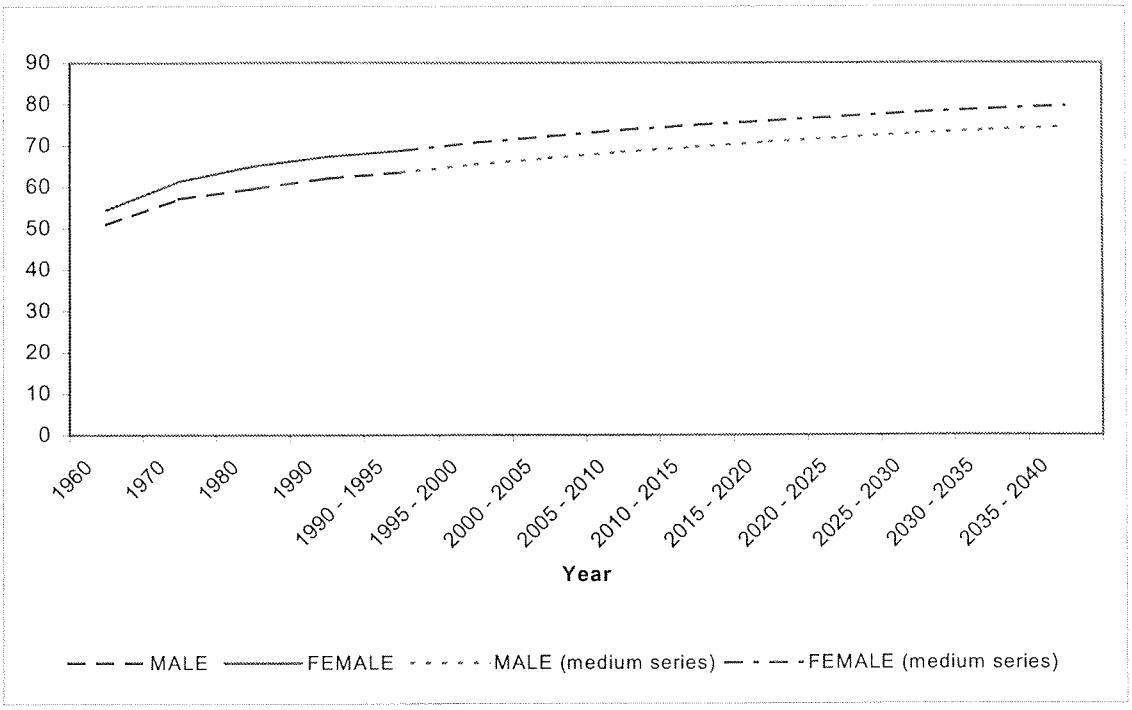
As previously stated, international migration hardly counts as a growth factor in Philippine population primarily because of the absence of data to substantiate this kind of dynamics. For purposes of population projections, the NSO has assumed international migration to be negligible. This assumption, however, did not prevent NSO from reporting some relevant statistics. Permanent emigration data from the Commission on Filipinos Overseas (CFO) give an estimate of 401,486 permanent emigrants for the period 1990-1995. Embassy data of major receiving countries[16] yield a slightly higher estimate of 499,929 permanent emigrants (NSO 1995). Given that the population of the Philippines was 60.7 million in 1990 and 68.6 million in 1995, these emigration estimates, if anywhere near reality, attest to the inconsequentiality of international migration in accounting for the country's population growth. Information on immigration is even harder to come by. According to NSO, "In the Philippines, such restrictions as the imposition of quotas and establishment of qualifications that potential immigrants must possess have made international migration insignificant as a component of population growth" (NSO 1999). It is useful, however, to note that the majority of the emigrants are female and were relatively young.

Trends in Land Tenure

In the Philippines, rural land tenure reform and concomitant productivity increases have been portrayed as being essential to urban industrial development. This is on at least two fronts, one whereby larger volumes of cheap food may be made available for the urban masses (the Chinese model) or that productivity increases lead to higher rural incomes, saving and investment capital for urban-industrial development (the Taiwanese model). However historically, in the Philippine case land reform and its implementation appears to be driven more by the need to reduce social conflict rather than as a method of facilitating economic growth and positive social change (Kerkvliet 1979). There are significant differentials between provinces in the per cent of farms owned (see Figures 1 and 8).

[16] The embassies of four major receiving countries, namely, the United States, Australia, Germany and Canada, provided data on permanent residents from the Philippines by year of entry. From their data were imputed emigration statistics of other countries.

Figure 7: Male and female life expectancy at birth: Philippines, 1960 - 2040



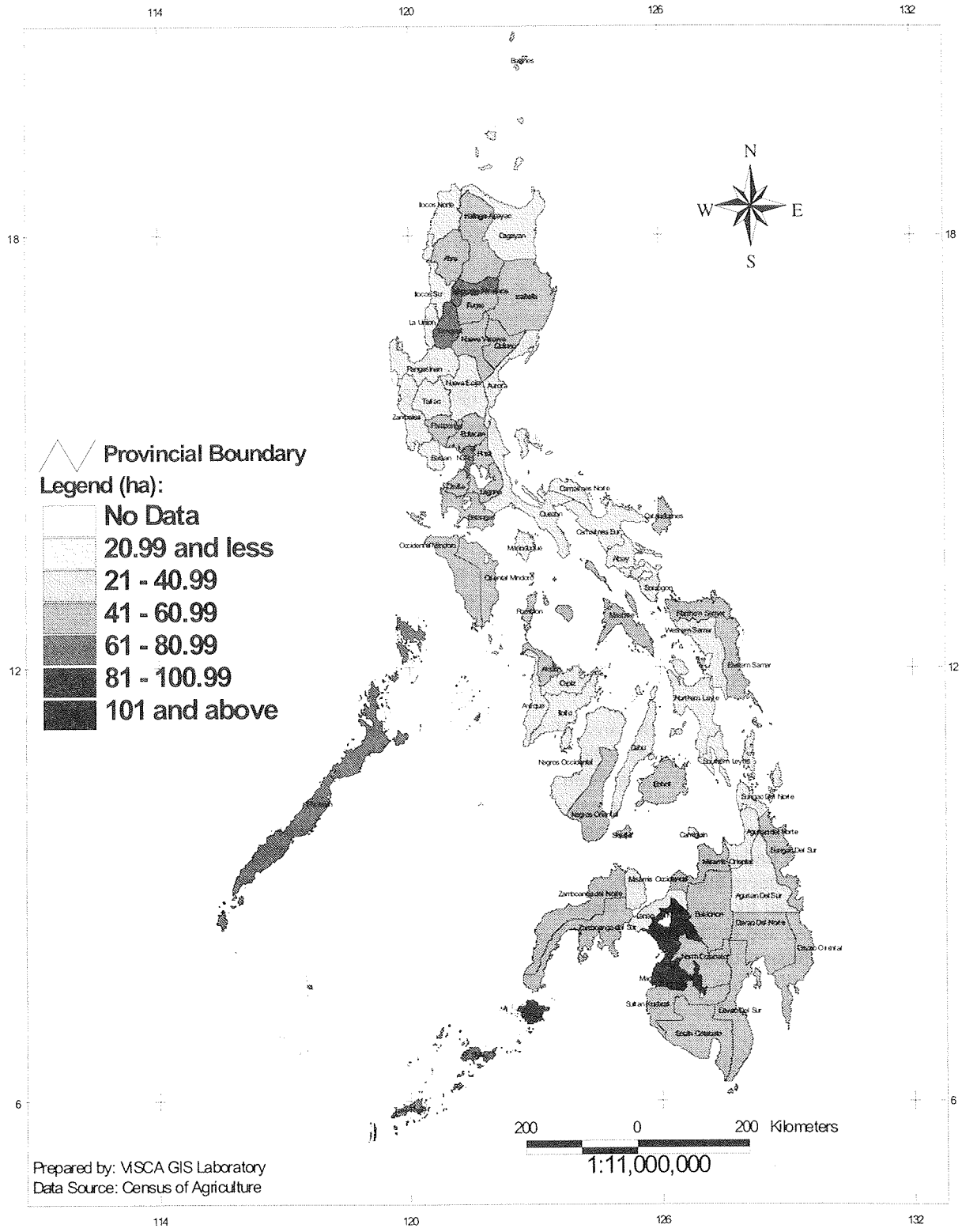
Source:

1) 1960: Flieger, Abenoja and Lim, On the Road to Longevity, Tables A1-A2 pp. 94-95
2) 1970–1990: Flieger and Cabigon, Life Table Estimates for the Phil., Its Regions & Province, By Sex 1970, 1980 & 1990 pp. 12-13
3) 1995–2000 to 2035-2040: National Statistics Office, 1995 Census–Based National and Regional Population Projections, Vol. I, Table 1-3, p.8

Philippine government policy in the area of agrarian reform has been widely criticised (Kerkvliet 1979; Kummer 1992; Lim 1995; Mangahas 1986; Putzel 1992). With the overthrow of the Marcos regime in 1986 and the ascendancy of Corozon Aquino, and the writing of the 'New" constitution of 1987, hopes remained high for the formulation and implementation of a more 'comprehensive' agrarian reform policy (Putzel 1992). Aquino's discretion in not pushing forward a program of reform when she held relatively unlimited law making powers under the Freedom Constitution stretching from March 12, 1986 to July 27, 1987 has been questioned (Esquera and Romero, 1991). Subsequent government policy on the redistribution of land — written and passed by land-owner controlled Congresses — has permitted large areas of public land to be legally occupied and cultivated. This policy was formulated in a period of increasingly vociferous and militant armed uprising (Jones, 1989). The 'classical' counter-insurgency strategy involved suppression of dissidents and allocation of public lands on long-term leases to particular groups (Dillon 1995; Magno and Gregor 1986; Pugh 1987).

Reform has remained high on the political agenda with strong pressure being exerted on the state by a militant peasantry exasperated with rising landlessness and the increasing concentration of land in the hands of a relatively few powerful élite. Land take-overs — peasants seizing and cultivating land owned by holders of large tracts of land — have occurred with greater frequency (Kerkvliet 1993). The Philippine Government responded to this 'threat' but, in an unexpected manner, they granted many small parcels of land to peasant farmers from the stock of publicly held resources. To close the circle, the release of these lands has had severe ecological and hence social consequences that are being played out today (Urich 1996).

Figure 8: Map of the Philippines showing percentage of farms fully owned by Province, 1991



Since the passing of the Comprehensive Agrarian Reform Programme (CARP) legislation in 1988 progress in land distribution in some land holding sectors has been more rapid than others. Generally, the public lands controlled by central government have been allocated more rapidly than 'alienable and disposable' (privately owned) lowlands. Fifty percent of targeted public lands were dispersed by 1995 versus 35 percent for privately held lands, which in the case of the latter were attained largely from the small-holder sector. More telling is the failure of CARP to redistribute lands above six hectares in the private land sector where only 7,508 or 0.8 per cent of 845,012 hectares identified for redistribution had by 1995 been disbursed (Lim 1995). Meanwhile the allocation of public lands has moved relatively quickly in spite of the fact that many of these lands have important geographical and ecological features that can constrain their full and sustainable development for agriculture, namely they are steeply sloping with fragile soils, and are situated at the headwaters of important river systems. Moreover, many of the lands are situated in island interiors and are thus poorly accessed.

Land Availability, Land Tenure Reform and Population Constraints: Strategies

To sum, for a number of reasons there is very limited frontier land available for settlement. Land reform has been more effective in turning public domain over to farming, often with negative environmental consequences, than in changing ownership patterns to ensure redistribution and "security of tenure". Recently, moreover a desired goal of increases in production has not been met. But in the background to all of this is the question of population.

As we noted, a macro-level growth is rapid even by S.E. Asian standards. At a micro-level family size, as measured by fertility rates, is dropping, but the "youth bulge" is being a factor as much of family structures, as it is of the national age-structure.

Spontaneously, the Philippines, and its rural families are putting into place strategies to counter the lack of real land availability for a burgeoning labour-force new entrant age-group. Moreover, the life-cycles of household add to the complexity of this issue. For example, a lage and growing young family has different food requirements from a family that is losing members as young people leave the nest (Gultiano & Urich 1990).

Major strategies to overcome these problems are urbanisation and international labour force migration. This diminishes pressures in families and food resources and can have the added advantages of furnishing remittance income (Urich & Edgecombe 1999). For those remaining in the village almost the only possibility is the informal use of land in the public domain, and most of this is remote and with high levels of local relief. Agrarian reform may provide land, but usually yields small parcels that become fragmented (Gultiano & Urich 1990).

TOWARDS A CONCLUSION

This paper has wider implications, including those of major significance for politicians. As CICRED (2001) has noted:

> The issues of environment and sustainable development will figure prominently in the future agenda of the international community, in particular within the UN Commission for Sustainable Development as it prepares Rio+10 for 2002. CICRED believes that there is a danger that population factors will not receive sufficient attention in the process and the debates of this conference.

Our paper has shown that these issues are complex and go to the very heart of the population and development equation. The Philippines' example has shown that sustainable development, the most favoured outcome for the future of the nation's rural population, is going to be difficult to achieve.

The intention here has been to stress the problems to politicians like you, but not to deliver a polemic. We recognise that you are already among both the converted and the more knowledgeable in your profession. What we therefore have attempted here is to provide you with an evidence-base, from which one simple

conclusion can be drawn: that no uni-dimensional policy can address what is a very complex multi-dimensional question.

Our paper has shown that the population is itself adopting diverse strategies relating primarily to human capital issues. Perhaps, an immediate role of policy is to address the intellectual capitalisation that might support the strategies families are implementing. Along with that must be policies relating to security of tenure to those who remain at home and attempt to increase production.

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"Food Security, Population and Free Trade"

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This paper will first focus on the relationship between population growth and food security. It will then examine the impact of globalisation and the free trade principle on food security.

Food security has been defined as the access for all people at all times to enough food for an active, healthy life (FAO/WHO. 1992). Since the International Conference on Nutrition in Rome, 1992 new ideas have been added to this definition. Both physical and economic access, having both safe and nutrious as well as sufficient food and such adequacy of food should meet people's dietary needs and cultural food preferences.

The issue of food security has then dimensions. Firstly it is necessary to ensure a safe and nutritionally adequate food supply both at the national and at the household level secondly, there should be a reasonable degree of stability in the supply of off and thirdly and mostly importantly it should be ensured that each household has the physical, social and economic access to sufficient food to meet its needs. The three dimensions of off security are availability, accessibility and adequacy of food supply.

Having defined the various dimensions of food security, we should now examine whether there is enough food in the world to feed its growing population.

On 12th October 1999, the world's population reached 6 billion with the birth of the sixth billionth citizen at the Savajevo Kosevo Hospital. The child was just one of the 370,000 babies born on that day. According to the United Nations projections the world population .has been growing by 78 million persons per year. This growth has been the most rapid in the history of population growth. The world's population stood at 1.5 billion at the turn of the 20th century. But since 1950 it had increased from 2.5 billion to 6 billion in 1999. According to the United Nations medium projection the world population will read 8.04 billion in 2025 and 9.4 billion in 2050. Over the next decade more then half the population growth will be in Africa and South Asia. Indian's population reached 1 billion on 11 May 2000 and it is growing at the rate of 17 million people per year. Although Asia has half the highest population of growth rate, the family planning efforts of countries such as China, India, Indonesia and Thailand have been successful in reducing the growth rate below 2% per annum.

This decrease in fertility rate is attribute to better reproductive health and family planning services, improved education of the women and the increased mortality due to HIV/AIDS epidemic. It has been estimated that AIDS has already taken 14 million lives and about 33 million adults and children are living with the HIV virus. UNAIDS estimates that every minute, five young people between the ages of 10 and 24 become infected with HIV. The impact of AIDS will lower the population in some of the African countries. In 2020, Uganda will have 45% smaller population; 35% in Rwanda and 30% in Malawi.

Inspite of the impact on AIDS, the forecast project that the population of nearly all the worst effected African countries will double their population between 1990 to 2020 . The impact of AIDS has other consequences such as increasing the infant mortality rates and decreasing the life expectancy of the population .

FAO has also shown that the HIV/AIDS pandemic exacerbates existing obstacles to production in agriculture and increases malnutrition. The sickness and death of working adults effects labour supply and division of labor between adults and children as well as between men and women . Thus AIDS is a

challenge to all agricultural institutions . Such a situation will effect the production of food at the best level and contribute to food insecurity .

Owing to National and International efforts to control population growth. The rate of growth will be significantly slower but the increase in terms of absolute numbers will be in the region of 7.3 10.7 billion in 2050 with 8.9 billion to be most likely figure based on present forecasting capabilities.

The question now is there enough food to feed the growing global population .

There seems to be differing views on food security and population growth.
The opstimistic view is that the earth can support the population of between 7.7 billion to 12 billion. Recent history of food production seems to be reassuring. In 1995, world per capita supplies of food for direct food consumption were 18% greater than 1965 , which during that period the world population has increased by 70 % .

This optimistic view is based on the success of agrotechnologys and the Green Revolution where the food production has increased faster than the growth of the population This increase in the agricultural production was largely due to high yielding seeds, the use of chemical fertilizer , machinery and irrigation.

Robert L. Thompson of the World Bank that is potential to more than double the availability of world food by increasing the productivity and effeicncy in the food and agricultural system .

This increase in productivity can be obtained by reducing post harvest losses , which is estimated as much as 20-30 % and other losses assiociated weeds, diseases and insects. He also advocated more support for agricultural research and the transfer od environmental benign technologies.

A related view is that the world produces adequate food for its population but the inequitable distributive mechanisms and trade barriers are some of the causes for food security as well as poverty .

It is estimated that there is is 1.3 Billion people throughout the developing region who lives on an income of less than One US Dollar a day. It is also estimated that 800 million people most of them in the developing countries who do not have enough food to meet their basic nutritional needs. The World Food Summit (WFS) of 1996 has pleaded to eradicate hunger in all countries and to achieve food security for all and to reduce the undernourishment to half of its present number by 2015.

The opposite view in relation to population growth and food security is that the food production is not keeping pace with the population . The environmentalist view that population growth as a problem , which depletes the worlds natural resources . Rapid economic development as a strategy to cope with the increase in population leads to environmental degradation such as deforestation , decrease in soil fertility , increased soil erosion flooding and other related perturbation of the eco-system.

The process of urbanization also leads to water, noise and air pollution as well as the problem of waste disposal . In the agricultural sector the pressure of of pollution leads to cultivation of marginal land such as steep slopes , arid land and tropical forest . This sector also depend increasingly on chemical fertilizer and pesticides which contimate surface water , ground water and related eco-system . This situation will lead to deteriation of health of the rural population .

A good example of environmental degradation are the fires of 1997 in Indonesia which is described as " an ecological disaster" has destroyed 263,992 hectares of of forest and land. The fires was mainly caused by land clearing for agricultural plantation and timber estate concession . Shifting cultivation by transmigrate also contributed to this disaster. The fire brought widespread haze to most Southeast Asia and has caused food shortage and loss of livelihood and income . The losses inccured by Indonesia, Malaysia and Singapore are estimated to be US4.4 Billion . The fires and the subsequent haze has also led to food shortage and a significant increase in the numbers in the poverty group.

An UNDP report estimates that in Indonesia 40 to 60 Million people would fall under the poverty line – an increase of 40% from 11% in 1997 . Another estimate indicates that another 500 million new people around the world would join 1.3 billion people already living in absolute poverty . Unless the problem of poverty and malnutrition are addressed in a serious manner , the increasing numbers joining the obsolute poverty group would have serious implication for food security and sustainable development.

In terms of shortage of food, Hiroshi Tsujii quating FAO data states that the annual growth rate of grain yield has declined continuously from about 3% during the 1960's to about 1% during 1985 and 1996. According to Tsujii, the grain yield must grow at 3% annually but the actual growth rate is only about 1%.

Using a simple projection model he estimates that the projected deficit of grain in the year 2020 will be 417 million metric tons. Other organisation such as the World Bank and IFPRI consider the grain price will decrease by 10 to 30% and thus there will be surplus of grain in the world in the early 21st century. Tsujii considers this projection as too optimistic.

UNFPA Report on Population and Sustainable Development also cites figures, which are disturbing. It states that the world cereal production per person is on the downward trend from 376 kilos per person in 1985 to 332 kilos in 1995. World stocks of cereals have also fallen to low levels from 22 % of annual consumption in 1992 —1993 to only 15% in 1995. 1996, enough only for 54 days' needs. The smaller stocks are primarily due to reduced surplus production in developed countries.

The reasons for the decline in the grain yield are attributed to the shortages of water, non-availiability of arable land, global warming, increase in cropping intensity, soil degradation and reduction in expenditures for agriculture research.

One of the reasons given for food insecurity is the existence of trade barriers between nations. It is argued .that if tariffs are done away with and trade is liberalized, then greater security of food for the world population would result. This is the underlying assumption of the process of globalisafion and the WTO free trade principle. We will now review whether the trade liberalisation is a boon or a bane for agricultural production and food security especially for the developing countries.

Free Trade essentially advocates the free exchanges of commodities across political frontiers without restriction such as tariffs; quotas or foreign exchange controls. This policy contrasts with protectionist, policies that use such restrictions to protect or stimulate domestic industries. The liberalization of trade is one the WTO and AFTA agendas so as to increase the flow of trade and to reap the benefits of comparative advantage.

It is argued that through trade liberalization food security can be altained by allowing agricultural products to move more freely from agricultural surplus to deficit countries. The system should also allow the food deficit, low income countries to export goods in which they have the competitive edge so as to earn the foreign exchange to pay for their food imports.

The above argument is acceptable in theory but not in practice because many of the developing agricultural countries face several problems. Many are concerned about the impact of trade liberalization on the incomes of farmers and food security for their nations. With increasing volatility in the supply of important grains like rice, many countries are sceptical about the internded gains from the free trade principle. They fear that they have to pay more for the food imports and that they will also receive less income from their agricultured produce owing the abolition of subsidies and export incentives. They are in a position of "double jeopardy".

Any review of the Free Trade principle should not be aimed at more trade liberalisation but instituting safeguards to protct the food deficit countries as contianed in the 1994 Marrakes Decision.

They also advocate the adding to the agreement a 'Food Security Box", which would specify protective mechanisms, promote a degree of self sufficicency in food production and preserve their agricultural communities.

Prof Hiroshi Tsujii argues that the trade liberalisation process with benefit the developed countries of the North more that the developing countries of the South. The reduction in the food production in the North is much more than the increase in the food production in the South thus causing an increase in the food price in the world.

He argues that the liberalisation of rice trade will destalise the rice industry and will contribute to the huge Asian hungry of 0.5 million. Since most of the Asian countries pursue a policy of self sufficiency, he advocates a system of 'autonomous tariffication'; under which a tariff is determined autonomously by each country determined by their need for self-sufficiency.

The question is does food security increase with the level of self-sufficiency. Some researchers argue that this is not necessarily so. A policy of self sufficiency is likely t make domestic process more rather than less stable unstable. The promotion of sellf-sufficiency policy may result the agricultural sector to be more dependant on imported inputs such as energy and thus increase the price of agricultural products. Inspite of this situation many developing countries follow a policy of a reasonable degree of self-sufficiency to ensure food security. This is a form of risk insurance to avert the uncertainties associated with international food supply even in peace times owing to crises such as plant an animal diseases extensive radio active fall out or major shifts in global demand and supply (FAO, Paper No 5, 2001).

The problems and risks that will be experienced by the rice farmers in Malaysia with trade liberalisation has been well articulated by S.Jegathesan in an article entitled "Perils of levelling the rice field" (NST, April 26,01).

The rice industry in Malaysia is a heavily protected and subsidized industry owing to the policy of self-sufficiency as well as socio-economic and political considerations. The paddy farmer in Malaysia receives through the Padi Price Subsidy Scheme RM248 per tonne of padi and free fertiliser programme valued at about RM160 per hectare per padi crop. This support system accounts for about 60% of the farmers income from padi. These supports are non-compliant with the principles of trade liberalisation as required by WTO and AFT.

For the traditional farmer, farming is a cultural activity and has psychological attachment to rice may often defy courentional economic rationality. The removed of the support system as required by WTO will result in the abandonment of padi land, farmer displacement and widespread social as well as economic distress. Such a situation may lead to undesirable political consequences. Jegathesan advocates that the negotiators use the 'Green Box Policies' to obtain reasonable support for the industry.

The relationship between food security and the free trade principle is a complex one. Whether the free trade principle will ensure food security for all will depend on how the negotiators balance the desire for self sufficiency of many developing countries with the principle of free trade – freer, fairer and surfettered trade across international boundaries.

Discussion

MS. BUNKLE, MP (NEW ZEALAND):
I would like to ask a two-pronged question. The first is, you claim that there is absolute increases in food production globally, but we know that there have been claims that this is more apparent than real because it's only counting the food that becomes part of the market system and is therefore counted, and that the appearance of increased food production depends on ignoring the previous production for use and self-sufficiency that peasants produced for their own use which was never evaluated or counted. I would like some comment on that, especially in the light of the important discussion around the invisibility of women's production in subsistence economy. And the second question I'd like you to comment on is, in order to get increased productivity, is intensive, highly capitalised agriculture the only way to do that? Can you get increased productivity through efforts of self-sufficiency and diversification of product of the sort that we saw on the picture in Vietnam with the multiple production for use of shrimp, rice, fruit and vegetables from the same land? Can we get more intense production from that model, as it's been claimed by many people, or do we have to get increased productivity through more impact of energy, mechanization, capital inputs and so forth?

DR. XUAN:
The increase in food production, if you at Europe or America or even here in New Zealand and Australia, we can see that the surpluses are there. But if we go to Africa, Middle East, or even to our neighbour here to Malaysia, you can see that the production rate, or the production level, is not high as we expect. In fact, in some of the many conferences I had with friends from the Sub-Saharan Africa, the notion is that it is cheaper to import food than to produce food. And this is true. When we look at Japan, for example, it is much cheaper to import corn, hay and so forth, than to produce it itself. So there is some comparative advantage in the production. However, there are countries that want to go into subsistence, or self-sufficiency, and it is there that we have to take into account—give more attention to women, to the rural folks who need the technology, and also to the capital that they need to produce. So that will link to your second question that would... I believe that high input production is not sustainable especially for the poorer region. This is because, number one, to use the technology, they must have the ability and skills, which they usually lack. Secondly, the capital, which they also lack. So, adapting to agro-ecological approach—something that they know, they have been used to—and we just improve it a little bit more. For example, pig raising using the manure from pigs to fertilise the rice soil, is a very old way in Vietnam and in China. Or using the azola—I think you've heard about this fern that has very high nitrogen content—to cultivate this azola and fertilise the rice soils. It is also an old technology, which unfortunately is disappearing because of readily-available fertiliser, inorganic fertiliser. Farmers now have the opportunity costs of doing things. It is more costly for them to produce azola, so it is better to just buy urea—it's very cheap. Therefore, like in Vietnam, the rice-fish or the shrimp-rice, that I have shown you—this also you can intensify. First, we have to produce a better rice variety that goes into that system so they can get rice yield twice as high as the old varieties. And also the shrimp—how to feed the shrimp with materials that can be grown in abundance instead of buying from the store. And the matter of how to select, how to define, to select the kind of roots, or leaves or protein that they can grow around the dike in order to increase the yield of the shrimp. So I think the agro-ecological approach would be there—very sustainable, familiar and user-friendly with the poorer people. But we are providing scientific and academic help, and researching each of the components for improving the quality so that they can intensify the system. I hope I've answered your question.

DR. SURAPATY, MP (INDONESIA) :
My question is addressed to Professor Xuan and Professor Marimuthu. According to Professor Xuan, globalisation will potentially bring new opportunities. But Professor Marimuthu, I think, it more pessimistic because of income disparity and inequality among the developing and developed countries. What is your comment? Professor Xuan is optimistic and Professor Marimuthu is pessimistic.

This issue will be discussed by us this afternoon in greater depth. I think, and I think Dr. Marimuthu will

also agree, that globalisation is something that is already there for a century. And it will be enhanced in this period. A lot of enhancement will be caused by all these trade regulations. If there were no trade regulations, then it will be OK. But since many countries are now trying to produce the same items, tariffs are created to protect the domestic market. And that is why when the farmers are not ready, or the people who are in the services are not ready, or the people who are in the industry are not ready, or not having the same level as the competitor, then it is a threat—it is a big challenge. And this is really a loss to a country that cannot compete. But the opportunity is that countries now have the opportunity to freely sell anything they have. So the population can improve their income by having a larger volume to export. But that's only when they can compete. But in most cases, they cannot compete. That's why what Dr. Marimuthu says is very correct.

DR. MARIMUTHU:
There are different views, as I've said in my presentation. The issue of globalisation as a whole—whether it will benefit the developing countries—is controversial. I think the battle of Seattle in 1999, and also in Switzerland and later in Sydney and May 1 in London... It's a point of view that they feel that it is capitalism again, and therefore it will not benefit the developing countries. But my example has been specifically point to the rice farmers of Malaysia—as I've said the rice farmers of Malaysia have been subsidised to the extent of over US$100 per hectare. And if tariffs are used, they will not be able to compete because rice produced in Thailand, Vietnam and Burma are much more competitive as they are produced at lower price. And therefore, if we take away the tariff, there will be a whole lot of farming communities that will be displaced. And it has got political consequences for the country in the sense a large portion of the farming communities in Malaysia are supporters of the ruling government. If we are displaced and they are dissatisfied, then you'll have consequences. In terms of economic efficiency and so on, this is something that we have to look at in broader view, just not reduction of tariffs. Although it is said that tariff reduction increases the GDP of respective countries. It is something that we'll have to discuss globally as well as on a country-wise basis.

CHINA:
This morning, we have here very wondering delivery of speech from three experts. They were talking about food security and relations between population and development. We have found that in your excellent speeches, we are confronted by globalisation. I think different countries, big and small, rich and poor, have different national situations and therefore have different analyses according to our different national conditions. That's my question. I have my view and I think food is the basic material for economic and social development. Food security is the most fundamental security to a country and a region. It is of very significant implications to the region and to the global stability and development. We have an idiom that says "If we have food, we do not worry about anything." It's a Chinese idiom. Before liberation, before 1949, over 80% of the population in China was in a state pf long-term starvation or famine. And now, after the formation of the republic, we have achieved great success in the production of food. But there are still many problems existing in the Chinese food security issue. Arable land is on the decrease, agricultural foundation remains very weak, ability to resist natural disaster is not strong enough. We should conduct an in-depth research into these issues and we rely on our own efforts and will mobilise the mass to solve this problem.

We have adopted the following measures.
Promoting green articles and ecology by applying science and technology.
Transforming low- and medium-yield farmland and increasing unit-area output.
Exploiting the potentialities of aquaculture, livestock products and food products for implementing family plain policy.

Food security is not a problem of one country's concern. It a regional and global issue that requires concerted efforts of every country. China is willing to join hands with other countries to make its contributions to settlement of the food security problem in Asia. And we are pleased to see this conference being held on this theme. Thank you.

VIETNAM:
I have a few words about the comment just made by the honourable delegate from China. China really has a good food security policy. That is why when we read the book by Lester Brown, "Who Feeds China?," it says that the Chinese will feed themselves, no one else. And this is true. But China's policy allows the farmers the freedom to produce what they can sell from the very beginning. That is why they can switch. Also in Vietnam, we are using very short duration rice varieties. We can have a new crop after 4 months. So food security is far more assured compared to other countries that are using rice varieties that have to be grown during the main season. Like in Japan for example, you can only grown one rice crop because of the weather. But in South China, Vietnam and Thailand, we can grow rice anytime of the year and still obtain good yield within 3 months. I'll give one example. In 1995, Japan had a very cold summer and Japan's rice production was reduced by 1 million tons. And Japanese can only eat japonica rice. They don't like Vietnamese rice or Thai rice. So they had to buy japonica rice from the northern part of China. So 1995 was a good year for China to export rice to Japan at very high price. Therefore, northern China was able to buy rice from southern China at high price. So the farmers in southern China were rushing to ship their rice to the north and did not have enough rice for their own use. So rice from Vietnam was rushed into southern China. It was also a very good year for us in selling rice. We were able to sell for 8,000 dong per kilo what we usually sold for about 3,000 dong per kilo. So the farmers in Vietnam at that time were very happy. They thought no crop was better than rice. But Southern Chinese also thought no crop was better than rice. So they stopped growing vegetables and switched back to rice. In 1996, China did not import any rice from Vietnam because Japan did not import rice from China. So we had a price crush in Vietnam. And now, China is exporting rice. In Vietnam, we are saying that one of the reasons the price of rice is so low is the coming of India into the picture of rice export and export of rice by China. So the price of rice is very low now in the international market.

DR. POOL:
Thank you very much, Mr. Chairman. There was an issue raised last night by Steve Chadwick in the New Zealand delegation that hosted the dinner last night, in which he complimented this organization, the Asian Population and Development Association, for taking population and development in a much wider way than it had been in a last little while, and I wanted to follow that up. If I may, Mr. Chairman, be so bold. I'm not a politician, I'm not a policymaker. I'm just a simple academic. However, I was on a New Zealand delegation at Cairo, so in part, my comments are to New Zealand's members of parliament who are here, but also to others, particularly to people from country like Japan, which plays such a major role in the international community. That is relating to the both the process of Cairo+10 and the focus of Cairo+10. I must also add Rio+10. We're talking about the family of United Nations' conferences. I think that Rio, except in a very simple way, lacked a demographic focus. It was almost as if people were no major players in the world. So I would make a plea that, and as has happened in the quotation I gave in the paper, that at Rio+10, the delegations from this region from throughout and any other that you can influence, bring population much more firmly into the environment discussions.

That was the case then. But Cairo+10 concerns me even more because the conference in Cairo was called the International Conference on Population and Development. And in the words of one French demographer, Jacques Vallin, who is the Vice President of the International Union for the Scientific Study of Population, he said, "This was a conference on population and development in which there was no discussion of development." And I want to raise that issue because it seem to me that there is a possibility here, with parliamentarians, to attempt to change that. In part it was the process that led up to Cairo when I received the papers from Prep-Com3, the committee which was preparing for Cairo, I could not believe their papers. It seemed that everything was reproductive health, reproductive choice and gender equity. All of these issues, by the way, I'm sure everybody here agrees with. They are very important issues. But one of the Mexican delegates in Cairo said to me that they had counted the word "reproductive choice," and there were 127 mentions in quite a document of the word "reproductive choice." "Old age" and "reproductive choice," "migration and "reproductive choice," "labour force participation" and "reproductive choice"—it came right through the entire document. So I would make a plea for much broader one and I'm therefore delighted, Mr. Chairman, that your association has focused so much on what are really the critical issues of development—the food, security, water security and development must be

amongst the most important, they also of course, bring in the environment. And it also means that we are talking in a multidisciplinary way about population and development issues. So we can have an agronomist and a demographer on the same platform speaking similar sort of language. So I would make a plea, Mr. Chairman, that your association follows this excellent lead that it has in this particular conference by making inputs to the preparation for Cairo+10 which give a much broader view of population and development. I make that particularly to my own country—that's the only one I have the right to speak to, but I would also pray that others do the same. Thank you very much, Mr. Chairman.

MR. HOLLIS, MP (AUSTRALIA):
I thank Professor Pool very much for his comments. Within AFPPD, it has been a deliberate focus because in the very early days, as I said yesterday, we didn't just focus on population because that was an issue. But we did quickly become aware that there is no way you could deal with population in isolation, and over the years we have concentrated on gender equity, on food security, on water resources, violence—all of these issues. On the conference Cairo+10, I attended the original Cairo Conference and I've attended many international conferences and I've just concluded 5 months as a part of the Australian delegation to the United Nations. The real difficulties when we are dealing with governments is that we are dealing with such a broad range of sensitivities and religion, and I remember at Cairo, people who were part of the deal there was to respect cultural differences. Well, I actually said that the problem was "respecting," although I was in favour of respecting cultural differences, often they were the very cultures that led to the difficulties that we were facing. So, when you have to get consensus, which international conferences aim for, and you've got religions of the world, the Vatican and others that are loving very very heavily, you've various governments which have within their own domestic jurisdictions difficulties that they've got to accommodate, I sometimes wonder how any progress is ever made in the international field. And so I think that on a more regional level, where we can come and talk very freely—for example, in Malaysia early last year, I attended a conference on HIV-AIDS. That was a very very sensitive issue especially in the Malaysian context. But people could come there and speak very very freely and openly, they couldn't do that, I suspect, on an international conference in New York. I don't know what the answer to your question is, or your comment. You've put it well. I'm sure that politicians, and especially those that are on these delegations will aim for much broader one. But don't hold your breath that this is going to be the solution to it, because it is very difficult when you've got to take into account this huge and diverse range of interests, pressure groups, sensitivities... As I said earlier, I sometimes wonder that any progress is made at all, but I think we're slowly making it step by step.

DR. POOL:
Thank you very much for those comments. I think that they are entirely... I take on board completely. I think that you are absolutely correct. I must say that the document that came out of Prep-Com3 was itself not a very sensitive document. I was not surprised that there was reaction by a lot of countries. Although it expressed views that I would support, I felt that it did it in a way at times which was not as sensitive as it might have been. But my point was actually much broader than that. If we look at Prep-Com3 documents and the one that all the debate was about at Cairo as you recall in the main committee, it was huge amount of debate. And that was a circus, in some ways because it was getting to the press and so on. There were two things were very interesting. One was the plenary session, which got no publicity or very little publicity. There was a total cleavage between the wealthy countries and the poor countries in what was being said there. That was very very disturbing, and particularly the African countries where they were concerned, for example, of development, their production, those sorts of issues. But even if we look at the very narrow issue of population, it is my feeling as a demographer that population was not covered at Cairo. It was so specific to reproductive health. I think it missed the larger issues of population. In fact, let's take one from my paper today. At Cairo, at the time of Cairo, twenty percent of the world's was aged 15 to 24 years. Twenty percent. These were the most mobile group in terms of migration. They are the new entrants to the labour force. They are the people who are going to become parents. And except for their sexuality, we never ever discussed them. As middle aged people we sit around and say, "Oh, the young are dreadful. They have all the sexuality" and so on. We talked about adolescent fertility, but we never ever talked about the rest of the things for that twenty percent. So here was a huger population issue, which was missing almost entirely, from the Cairo Population Conference. Thank you.

DR. MCMURRAY:
I'd like to follow up on the point made by Professor Pool and the Honourable Hollis. I'd like to take some responsibility here for the problems of the lack of integration of population and development issues. And I think some of the responsibility lies on the shoulders of demographers and statisticians. I've observed in the Pacific Region that, in the past, there hasn't been very good integration of population and development. And one of the reasons is because there has been too much separation between demographers and planners. Now demographers and statisticians have done their job very well. They've collected the population data. They've produced wonderfully big thick books of statistics. And that's it. They said, "OK. That's what we're hired to do. We've produced the numbers. Now the planners and the politicians are very busy people. They look at this and say, "Well, population... Yes. What does it all mean? What are we going to do with it? We haven't got the time to read the census report. It's 390 pages long. Well, population... It's all right. We'll just leave it there." But there is a need for interpretation of the data, for simplification and for presenting it in a way it means something clear, so that the planners can use it. Now, I don't know the extent to which this is an issue in your country. But it's been very much an issue in the Pacific. And we are now encouraging everybody to go a step further and to produce the data in a way that makes it readily usable to include in the planning process. Now at the Cairo conference, the focus was on reproductive health, and this is the new focus of UNFPA now. And it is not putting as much effort into helping with data and interpreting data as it used to in the past. So I would say, putting the plea for parliamentarians to go back to statisticians and demographers and say, "Please go a step further and give us the data in a form that we can use easily, instead of just in the big thick book. We need the big thick book but we need the small leaflet and the pamphlet in the easy-to-read format as well.

MS. BUNKLE, MP (NEW ZEALAND):
I would like to just respond to Professor Pool briefly. I think this organization has been extremely effective in encouraging dialogue between international experts who have developed their analysis largely through international agencies. And those agencies, if you like, have developed as a sort of industry of their own, and this organization has recognized a need for there to be communication between that body of expertise and parliamentarians around the world and I think that's extremely valuable. But I think there is a step that we need to take too, which is about how the parliamentarians are going to dialogue with the government planners and people who develop policy within their own governments to translate that into action.

We should make sure that we always had an observer—we invited an observer from foreign affairs, from the overseas aid units and so forth. The people who need to hear the dialogue and access these ideas. And I realize sitting here that we've done a same thing again at this conference. We've left our officials behind in Wellington. Now, what I think might be a good idea is for the delegations here to remind themselves of this and to come up with a brief statement to the organization when they accept the responsibility of being a delegate to tell the organization what their plan to communicate with their government agencies is going to be, so that we get some plans in place for a three-way dialogue, and that may be when you go to another country, you have the people from your own embassy just if you take one person here. But just so that we'll have some plan in place for the feedback that we're getting to go someplace where it's definitely going to be heard. It will be different for each country. Each country has its own structures, it's own way of interacting with its officials and analysts. But it would be a good idea I think to just to give some conscious thought in each delegation before we come of how we're going to maximize the benefit of us being here as individuals in terms of influencing our government.

DR. MARIMUTHU:
I think the points that have been made are well taken, but in many of our countries we have got the Asian Forum for Parliamentarians. In so far as Malaysia is concerned, we delegates have levels. One is to educate the members of the Parliament. Unfortunately, not all members of the Parliament understand the issues of population and development. And therefore, what we do is we have seminars and conferences for members of Parliament, trying to get them involved with our activities of AFPPD. You'll understand that members of Parliament are very very busy people and they are really working at their constituencies. And your point is well taken, Dr. Chris McMurray, that as members of Parliament, we do not have the time to go through 360

pages or 500 pages of census report. We need somebody to highlight the main issues and main points, and that we have. The other level that we work is change agents. Change agents in terms of school, change agents are local politicians and those people who matter. And in that connection, honourable colleagues were there for the conference we had in Sabah in regards to HIV and AIDS. It is a subject which is taboo. But if we speak openly and objectively about the dangers of AIDS, I think we'll be able to get across. And therefore this will have the ripple effect of educating the community as a whole. Through AFPPD and other organizations we have, we'll be able to educate and at the same time benefit from our efforts.

Panel Discussion

"Globalization and Sustainable Development"

—Future of Asia and the Pacific—

Mr. Hae-Chan Lee, MP
President
Korean Parliamentary League on Children, Population and Environment (CPE)

Mr. Chairman of the Asian Parliamentarians' Meeting on Population and Development, Distinguished Parliamentarians, Ladies and Gentlemen,

At the outset, I would like to express my sincere gratitude to Mr.Chairperson for providing me with this great opportunity.

The quality of people's life is strongly interrelated with population change, patterns and levels of use of natural resources, the state of the environment, and the pace and quality of economic and social development. For example, population growth influences poverty, which, in turn, is often accompanied by malnutrition, low status of women, and limited access to social and health services, including reproductive health services. Such complexity cause all countries, particularly developing countries, to face increasing difficulties in improving the quality of life of their people in a sustainable manner.

Thus, population concerns need to be integrated into the formulation, implementation, monitoring and evaluation of all policies and programmes relating to sustainable development. In Korea, there was a very low level of economic development and very high level of population growth until the early 1960s, resulting in poverty being prevalent throughout the country. The Korean government therefore, adopted the National Family Planning Programme as part of the Five-Year Economic Development Plans, which started in 1962. The strong implementation of the national family planning Programme, together with changes in socio-economic development, have resulted in a rapid decline in population growth. As the population growth rate has been maintained below the replacement level since the mid-1980s, the Korean government adopted a new population policy in 1996, which puts great emphasis on the linkages between population and other development concerns in accordance with Programme of Action of the International Conference on Population and Development.

Distinguished Parliamentarians, Ladies and Gentlemen,

Food security, which is determined by food availability, food access and food utilization, is also of great importance in improving the quality of life. High population growth in developing countries has increased food demand, threatening food self-sufficiency. The increase in food production, as an effort to achieve food security of the growing population, has often caused environment degradation, such as soil erosion, depletion and contamination of fresh water, etc. Therefore, meeting the basic human need of food security must be dependent on a healthy environment. It is especially necessary to bring about population trends consistent with the achievement of sustainable development, which can be done by improving the quality of life through food security. To do so, comprehensive policies for sustainable development need to be developed in the context of population change.

Today, food security is strongly influenced by the proper distribution of food and rise in income to purchase the food. In Korea's case, although the level of food production has fallen below self-sufficiency, food security with equal access to food for every man and woman has been achieved, which can be attributed to low population growth, rise in income and international trade. Thus, international efforts to attain food security at both the national and global level, should be focused on controlling population growth, together with improvement of food accessibility through appropriate distribution systems and maintenance of sustainable food supply systems.

Distinguished Parliamentarians, Ladies and Gentlemen,

In Asia as the most populated region, the demands of the growing population on the improvement of their quality of life will increase in diversity and a higher level of services will also be requested. Accordingly, in the 21st century population control will be continuously important as a base for providing the quality of life.

In recent years, the increasing number of AIDS patients, adolescents' sexual problems, induced abortions, and sexual discrimination shows that family planning programmes still need to be continuously emphasized to control population growth in high fertility countries. Since the ICPD Programme of Action provided the shift from using family planning programmes for controlling population to employing the right-based approach, reproductive health that incorporates early family planning into the general health programme, needs to be emphasized as a key programme in all countries, and full support is needed for legislation to ensure reproductive rights and reproductive health.

The promotion of gender equality, equity and empowerment of women must also be emphasized, as women's disadvantaged social position helps perpetuate poor health, and a continued cycle of poverty. At the policy level, the greatest challenge has been in improving the legitimacy and necessity of gender equality as a fundamental value that should be reflected in all population and development choices and in institutional practices. For legislative support, all countries must revise the legal systems that discriminate against women in accordance with international mandates such as the Convention on the Elimination of All Forms of Discrimination against Women. In Korea's case, there have been considerable legislative efforts to support the elimination of sex discrimination since the ICPD.

It should not be under-esteemed that the trends in low fertility and rise in life expectancy in many countries in this region will bring about the new socio-economic problems. As an example, in Korea the rapid population ageing and decrease in young population has been taken as an important challenge to cope with in this century since it will cause lack of labor and increase in expenditure for social welfare including pension and medical insurance. Efforts to prepare for such effects from the demographic transition has been incorporated into the 1996 new population policy in Korea. Thus, parliamentarians also need to pay full attention to these emerging problems in the course of demographic transition, in an integrated manner with sustainable development.

Distinguished Parliamentarians, Ladies and Gentlemen,

Most countries in this region have tried to integrate population factors into their development plans. However, there are varying degrees of success in doing so. The major constraints include the lack of political commitment and limited human and financial resources. It is also true in some countries that Governments often face priorities that compete with integrating population and development strategies. The integration of population into development strategies can be overshadowed by more immediately pressing economic concerns.

Thus, there is a need for more awareness and advocacy activities on the links between population and other development issues. Institutional infrastructure or politically empowered bodies capable of addressing integrated population and development issues need to be established. Also, parliaments need to provide the necessary support to carry these out effectively.

In conclusion, to ensure the improvement of people's quality of life in the 21st century, parliamentarians in every political and legislative activity must continue to pay great attention to population programmes which integrate socio-economic and environmental factors. International assistance also needs to be reinforced in population programmes for developing countries.

Thank you all very much for your attention and patience.

Panel Discussion

Moderator:
Prof. Vo Tong Xuan
President of Angiang University (Vietnam)

This morning, we talked about the opportunities and challenges of globalisation and its effect on food security. We can say that globalisation may have a direct effect on the economy of a country because every country, especially the developing ones, needs hard currency. So globalisation is an opportunity for them to export their products so that they can earn hard currency. And because of that, a country like Vietnam, we are used to producing high-yielding varieties of crops. And now we know that high-yielding varieties are not wanted by the customers elsewhere outside of Vietnam. So we have to improve the quality like Thai farmers. Thai farmers do not mind about high yield. They only mind about high quality. So Thai rice is always ranked as top quality rice in the world. Therefore in Vietnam, and in other countries, we need because of globalisation to improve the quality of our products. Then the irrigation scheme has to be installed and we have to use them more intelligently and effectively so that we ca reap the effect of globalisation. The new varieties of crops will gradually displace the old ones. Actually, many of the farmers are living in a very difficult situation. When they get their irrigation facilities, they will take on the new varieties to catch up with time and with the opportunity. However, I must say that one of the effects of globalisation is that while some farmers or some groups or sectors are doing their best to push forward, there are others who lag behind very very far because of their education and training. So one of the adverse effects would be the increasing gap between the rich and the poor.

As for the effect on the culture and the environment, we see that outward looking of the export-oriented. When we have globalisation, we always think of export. We always look out but very few of us are like us in Vietnam now. We want to export everything but distribution among different groups in the country is still lacking. And the forest resources will also be reduced. These are the adverse effects. The environment will suffer. For example, when coffee price went up and Vietnamese coffee was wanted by foreign companies, the forests disappeared. And lot of forests were cut down to be replaced by coffee plantations. And when coffee plantations were up, they consumed a lot of water, the groundwater and so forth. So this is another adverse effect of globalisation.

Salinity intrusion and acidification of the land and the soil also take place. Because of the obstruction of fresh water on the upper source, especially in the Mekong Delta, the region where I grew up, there is more water obstruction there and causing salinity intrusion. People upstream also suffer. And then we have the chemical pollution of the environment caused by agriculture.

Now on food security, when we try to export, especially at this time, only one month ago, the government implemented a new policy on agricultural production. Because we cannot sell our rice anymore, rice production is now allowed to be replaced by other crops that can be exported. This is one aspect of the new policy in response to globalisation. Unstable food price is affecting the households, especially the farm households without land. The prices of rice, pigs and corn are affected so much because of this supply and demand, but the tendency is that it is going down. So on the one side, the people who are not in the production will enjoy the low price of the agricultural products. But the ones who produce them, that is, the farmers, are the ones that suffer. And because people are rushing to higher yield and higher quality, they use more fertilisers and insecticides, causing pollution of the environment.

Another impact is depletion of the stock, both in the government and among the people. For a long time, food security in Vietnam was very much dependent on household stock. The government does

not have enough money to stock the amount we need. So one alternative is to ask the people to stock their own food. And because of this export, we try to sell as much as we can and our reserve is being depleted as a result. And reducing food stock area, that means some of the areas that are going to food now, to rice. I'm very sure that in a few years, we'll transfer to other crops that can be sold. And rice will be reduced to the amount we need. So this also poses big problems to countries whose needs of rice are being counted upon at this time. I think that by doing so, the reduction in supply of rice will cause an increase in price of rice gradually. And this is on the side of the producers. It's a good aspect. But on the side of consumers, we worry about this.

So how to balance this? This is really a problem. The alternative that I propose here is the prospect for cooperation. We want the world to share prosperity rather than face competition or instability. So if that is our goal, what should we do? For that, we have to realize sustainable land use—to produce according to the agricultural farming system approach like the one I described this morning. The ecology, the biodiversity, the biotechnology must go into government policy for improving the condition of the scientists as well as the farmers and producers to take advantage of. Intellectual property rights of the indigenous people have to be recognized because when we say we open up the market, the economy, the foreign companies will come in and indigenous knowledge on medicinal plants and herbal materials may be used by foreign companies to make new products so that they can get richer without recognising the property rights of the local people. So we must have legislation to take care of that. We also encourage also the comparative advantage production so that the countries in post-modern Asia will try to see which countries have more advantage in producing certain products—instead of every country producing the same product and competing with each other, resulting price crash.

We also have to give more attention to training and education as well as facilities that are provided to rural people, especially women and indigenous people. Countries also need a goof agrarian reform so that farmers will have good incentive to produce.

As our countries enter into the 21st Century, we realise that we are going to produce the products—rice, maize, banana and so forth. And each country will try to use their scientific and technological resources in order to produce the largest quantity possible. And by producing with comparative advantage for each country, I would like to pose this question. "Should there be a division of labour in this time of free trade?" Because if we have this division of labour, countries will not compete with each other to sell the same products. And by doing so, some kind of treaties among the Southeast Asian countries or Asian countries will be very close to what the European Community has been doing in the past two decades. And with these ideas, I would like to give the floor to our analysts to discuss further on the effect of globalisation on food security. First of all, may I invite Dr. Omar to say a few words?

Panelist 1 : Dato' Napsiah Biniti OMAR, MP (Malaysia)

At this juncture, I think, we have heard a lot of ideas from our speakers from yesterday and also today, this morning. I feel that on the subject of globalisation, it has been discussed also and as Professor Xuan said just now, it means opportunities for some countries but for other countries, it means that there are a lot of challenges that they have to face. But with respect to food security, I look again at the paper presented by Chairman Yatsu of AFPPD and I think he has put in this paper a lot of ideas. And one of the things that came out of this was that, as Professor Xuan said, the need for us to sit together according to region. It is the comparative advantage. I would like to also suggest, as a supporter, pick up the suggestion from Mr. Ystsu's paper—we should adopt a global food security initiative. Since we are coming, we should also be able to come down to regions and, as a suggestion, Dr. Xuan, let's look at the Asian region or ASEAN region. We are in the spot of war, I think. As a schoolgirl, I remember reading about the millions of people in China, as well as in India—and the question is this. "Who will feed these people?" But as we said this morning, through human ingenuity, China is able to feed its people. I'm sure we'll find ways of how to do it. But in this millennium, let's share our abilities, our strengths and our weaknesses together. I think it's a simplistic view, but the way I would like to look at it is that we are a family, and we have our strengths and weaknesses. And as you suggested just now, if Vietnam can produce enough rice and Malaysia is not producing enough rice today—I think we have self-sufficiency of about 60%. We can produce enough rice and as my friend, Dr. Marimuthu said today, there's a lot of subsidy. But we have our strengths. We produce a lot of palm oil. So I suppose, as I said earlier, we should do a lot of sharing. I also agree with you that we need to improve our quality of R&D and improve the quality of our food, but I would like to just bring a small point here that we were talking this morning about the production of golden rice that is rich in vitamins. I think that we must also bear in mind that there will be other dangers that come within. If I'm not mistaken, if you have vitamin A but not enough protein—there was an incidence in Indonesia sometime back, when they were providing a lot of vitamin A supplements but not enough proteins. I think that set the onset of vitamin A deficiency and that could lead to blindness. There is also a danger regarding manipulation of our food because there are other problems that come within.

So Ladies and Gentlemen. We have been listening a lot to macro-problems. I would like to bring your attention to the micro-level. My question is "Who is actually responsible for feeding the family. Usually it rests on the woman. While we talk about extension work, technology, spread of information, as on the macro-level, I feel that we also need to look at help on the micro-level for women who are producing the food and putting it on the table. So there is also a need to do that. Regarding food security, I also feel that there is a real problem in the future because of water resources. There will always be a lack of water, and in fact, just this morning I watching CNN, and there was a program about street demonstration in Pakistan, if I'm not mistaken where there is a shortage of water. And there was a talk about scientists who were trying to use glacier as source of water. But if you do this, you are actually upsetting the balance, and probably other problems will arise if you do this.

Panelist 2 : Dr. Muneaki SAMAJIMA, MP (Japan)

I think we need to address the issue of globalisation from two perspectives. One is the spread of diseases. When Britain imported beef from South Africa, the school in London used it in a luncheon. And when there was surplus, they used it to feed the cattle and that was the cause of foot and mouth disease. It took 4 months for foot and mouth disease to spread across Europe. Today, Danish pork cannot be exported. WTO system, globalisation in other words, has brought about the situation where diseases can spread much more faster than in the past. Here we are, sitting in Auckland, and I see a tremendous significance of my having to talk about this in Auckland, New Zealand, because both New Zealand and Australia have a very strict animal and plant quarantine. They have a bright record of success. Under the WTO system, what New Zealand and Australia have been doing all along is quarantine for plants and animals. I think we need to study what they have been doing and learn from New Zealand and Australia. That means there should be more self-sufficiency production, as much as you possibly can in every country. But as a teacher, Australia made a small mistake 10 years ago. I think it happened in Hawaii. Foliage legume, [lukaina glauca?]—this is a legume that came from Hawaii to the ranches of Australia. It has very high nutrition value and the sheep love it. But [mimosin?] is a protein contained in this foliage they take fur from the backs of sheep. And you can't make jackets from skinned sheep. Sheep needed jackets but their fur has been taken off because of this mimosin. That was a mistake made 10 years ago. I think the quarantine system maintained in New Zealand and Australia should be revisited in the age of globalisation. That was the first point I wanted to make.

The second proposal I would like to make concerns stabilisation of agricultural product prices. Dr. Xuan talked about the dangers of instability of prices of agricultural products. Those of us who inhabit this planet earth, for us to be sure about what we eat, we need to have sufficient production even when it is difficult to produce, even if weather does not permit. That means to say, we need 10% to 20% surplus in good years in order to store for bad years. But when the supply goes beyond that 10% of demand, the prices fall by 10%. If there is 20% excess supply, then the market prices go down by 50%. That we know from the past experience. We need to have sufficient production but find ingenious ways of stabilising prices—it is a difficult challenge but somehow we need to find solution to this. I think United States has one example we might learn from. Yesterday morning, Senator Shimizu said that President Bush threatened to get out of Kyoto protocol and she said it was much to be regretted. But before President Bush said he was going to take America out of Kyoto Protocol, in August last year, President Clinton said that America would depend on bio-energy for 90% of its energy requirement. In other words, United States is trying to get non-food use of agriculture as a second market in addition to the food market. In other words, America is trying to create a second market after the food market—non-food use of food, that is. Indianapolis in Indiana, I think sometime this year, Cargill, the largest food company, and Dow Chemicals would have 140 ton capacity plant for biodegradable goods. And that is one example of making non-food market, helping it to mature that market. That can help stabilise the food market on a high level and stabilise the prices as well. There is that possibility but we must also be careful because non-food market is a secondary market. If supply-demand situation of the first market becomes tight, then the grains that can be used in the non-food market will have to be fed back into the first market, and this is a political agenda of international politics. And perhaps even in Indonesia, I think it's Toyota, a motor company of Japan, has started to construct a plant for non-food use of grains and food in Indonesia. So when we think about globalisation, we saw some of the new methods of trying to ensure both sufficient supply and stabilisation of food prices, and I think we need to discuss this and visit this issue from a different perspective.

Panelist 3 : Mr. Alymbay SULTANOV, MP (Kyrgyzstan)

It's hard to underestimate the importance of water resources today as one of the greatest assets. In our days, rivers, lakes, seas and oceans get polluted, leading to ruin of flora and fauna. We can, and must, do something to stop this. And we must help each other by all possible financial and technical means. In each country, water is used in a number of different ways including drinking water, agricultural purpose and source of energy. So what we use instead of water to produce power? I believe neighbourhood countries should cooperate and exchange natural resources. I can give you the following example. Kyrgyzstan has plenty of water while Kazakhstan and Uzbekistan have oil and gas. Here is the base for interchange. I would like to mention that intergovernmental committee has been formed and is currently working to save the Aral Sea, which is drying out. Kyrgyzstan is feeding water to Aral with the help of River Naryn, which is535 kilometres long.

It is important to keep in mind that we share water resources of the same rivers and lakes. We should take into account legal requirements that control national usage of water resources. We all met here to contribute to the solution of this problem and look at how we can help each other. We have a saying, "Do not put too much fault on God. Blame yourself. I firmly believe that toady Kyrgyzstan is in a position to help any state with water resources. Let me give you a couple of figures. Water usage in Kyrgyzstan is 1,337 cubic meters in total per person per year and the usage of water for drinking is 65 cubic meters per person per year.

I told Dr. Nakayama that first of all we have to sort out legal issues. We should also constantly educate governments and stress the importance of the water resource issue. Legal agreements shall be put into place to control water usage on the international level. That is how I see our goal as parliamentarians. And in conclusion I would like to say that Kyrgyz people are looking forward to seeing you later this year. We would like to welcome you to our country where our national hero Manas was born. I hope you'll have a chance to see with our own eyes that Kyrgyzstan can really help with water resources especially with drinking water. Thank you very much for your attention.

Panelist 4 : Mr. Falemoe Leiataua TOLFUAIVALELEI, MP (Samoa)

Globalisation is an issue of the panel discussion, and this is one important issue that was strongly opposed by the leader of the opposition during the last general election campaign. He feared that globalisation in Samoa would expand the margin of the rich becoming richer and the poor becoming poorer as related by other speakers yesterday and this morning.

However, fortunately, the present government is not in those shoes. They promote globalisation as one of the important aspects of developing any country in the world because changes have come our way and we can't afford to evade it. We have to cope with the world changes in as far as development is concerned. In respect of globalisation's impact on the Samoan economy and population, we've seen a lot of changes in our intake of new diets and new food being imported into Samoa, although they present a good way of having a taste of other foods apart from Samoan traditional foods. But at the same time they also bring forth such problems such as diabetes and heart diseases to name a few. And these are the problems that the government encounters, and, of course, they are with the collaboration among government organizations and agencies involved in trying to bring up solutions for these problems. We are also appreciative of the assistances from international organizations such as the WHO, the FAO, the UNESCO, the UNDP, and likewise this gathering today and yesterday is one important sign of collaboration among the countries of the world, and especially the Asian group and the Pacific Island countries. T

This is a very good opportunity for myself to be exposed to discussions of what's going on in Asia and likewise in the Pacific in respect of overpopulation and the changes in food intake and the diet as well as food security and water resources. Samoa, in particular, is not very exposed to food problems because we have our own staple food and we have the marine resources that we rely upon. Nevertheless, we cannot avoid the import of foodstuff from overseas to assist up in our everyday consumption. In as far as water problems, this is one of the major problems in my country despite we too have a lot of rainfall as mentioned in Ms. Laban's paper presentation yesterday as well as the SPC presentation. Rainfall in Samoa is not a problem because we only have two seasons in a year, the wet and the dry season, but it is the matter of the quality of the water. I think that is the problem we are facing today and hence the inclination of the government to have these opportunities like the forum that we are participating for the last two days. In as far as these problems are concerned with the food security and water resources, globalisation, as I say, has helped to improve the economy of Samoa. For example in the manufacturing industry, we have some major manufacturing companies such as [Asakisa?] Samoa, which is a Japanese-based company that has employed more than 2,000 people, and thus created a lot of job opportunities as well as giving the opportunity for people to earn wages for their survival and living. Not only that, we are also providing at this stage opportunities for our younger generation to have access to better education because education is the key to any nation for its development and survival.

The first time a politician in the government of Samoa's parliament, which has only come into force at the beginning of this year. I have to collect all the information I heard today and yesterday, so that I can present a better report to my government for their information and future decisions in policymaking. I think that is the best idea. Policymaking is the responsibility of any government to ensure that the people, the population and those who rely on them for better living is well looked after.

To bring my comments to conclusion, I feel that it would be incomplete for my participation if I don't relate to you as delegates of this very important meeting, a very brief preparation I made on my country because a lot of you have not been able to visit Samoa and I believe only a few of you have had the opportunity to see Samoa as a developing country.

Samoa, as you may know, is only spec on the map of the world, but it is located 18,000 miles northeast of New Zealand. Total land area is 1,100 square miles and consists of four inhabited islands and six uninhabited small islands. The capital Apia is in the second largest island of Upolu. The climate is tropical with abundant rainfall and temperature ranges from 20 degrees to 30 degrees centigrade with seasonal variations. The total population in the last census 1991 was 161,000. The projected population in the year 2001 is 172,000 based on an annual constant rate of 0.5% since 1991 and 0.8 since 1996. The 2000 demographic and micro-statistic survey covering 20% of total population revealed similar characteristics as shown in censuses years back. The age structure of Samoa shows that the 41% of the total population are under 15 years of age, 55% in ages between 15 years and 64 years of age, and 5% aged 65 years and over. The median age is 20 years, meaning that half of the population is below 20 years and another half is over 20 years of age. This shows a very young age structure. The high proportion of children under 15 indicates the continuous demand for health and educational services for the children and young adults in the future. Samoa is among countries with high birth rates. The year 2000 survey reveals that the crude birth rate per 1,000 persons is 29.1. Using the 2000 projected population, which is 170,000, this means that annual number of births or newborns is about 5,000 per year, or 29.1 of every thousand. The crude death rate was estimated as 5.5 per every thousand persons, or an annual of around thousand persons dying every year. Almost 55% of all deaths were caused by non-communicable or lifestyle-related diseases such as heart diseases, diabetes and stroke. It is know that the changing of eating habits from traditional food to newly-introduced food are highly related to these diseases. The excess of births over deaths keeps the population at a high natural increase rate of 2.36%, or 4,000 excess births added to the population every year. An extra 4,000 babies in Samoa every year calls for an urgent attention from the health sector, especially agents dealing with women's issues related to family planning and motherhood. Samoa, like the Cook Islands, faces high overseas migration especially to New Zealand. The 2000 survey showed that a high migration rate of 10.7%, meaning about 1,800 Samoans migrated overseas every year. Of these migrants, 35% fall in the working age group of 20 to 34, and 44% consisting of children and teenagers under 18 years of age.

The main reason for moving overseas are in search of employment and better education for young children. The loss of future generation, and especially the skilled workers, is another population issue that needs attention by the government for future population policy. Due to the high outmigration rate, the growth rate for Samoa comes down to 1.29, or an extra of 2,200 persons, and 4,000 persons, in a year. It can be said that outmigration is a safety valve for high birth rate. However, this cannot be treated as a solution to high birth rates, as high birth rates are caused by high fertility rates. The number of children per woman, estimating at 4 children per woman on average, not migration. Therefore, to lower birth rates Samoa needs to pay attention to women's family planning programs, and especially educational programs not to only educate women but also the public at large. High population growth rates have adverse effect on all aspects of life, especially social and economic services provided by the government. The higher economic growth versus the slower economic growth means Samoa cannot afford to provide all the necessary basic needs, especially food and water to everybody in the population. The continuous high growth rate means that the government will continue to concentrate on social services to meet the basic needs of the population meaning less resources available for economic development and employment creation.

Apart from migration, high birth rate has been the major population issue in Samoa for a long time. Although family planning programs have existed in Samoa for over 30 years now, the high birth rates in the last decade indicated that there is still more work to be done. Maybe it is time for the government to step in and monitor this issue.

Discussion

MODERATOR:
We have heard the panel with their comments on the issues of globalisation and food security. May I take this opportunity to sum up the main ideas that we have discussed.

Food security, to some country, they prefer to have their staple food produced in the country. Like the case of Japan, for example, and some others. But in some country, it is not necessary, but to take advantage of the environment of the ecosystem of the country, such as Malaysia. It's not economical for Malaysia, for example, to try to grow rice on her very dry soils. With this kind of reasoning, I think a country like Singapore will not need to grow any rice. It's better to buy rice because it's cheaper. So that is one. Second is the fact that we need to have this division of labour in the region. We are better in producing. Instead of trying to produce something that is not efficient. So in that case, should the Asian countries get together to establish some kind of community like the European Union where we would have a location for production of several products instead of every country continuing the same way we are doing now? As Professor Samejima said, when the supply is excessive, the price will clash.

Also in globalisation, we share the same feeling as Kyrgyzstan in that since Kyrgyzstan is richer in water resources, it is better to exchange with other resources from the neighbouring countries instead of trying to get other resources by themselves. Professor Samejima also brought up another two issues that globalisation may affect; the food security, the possible importation of diseases and pests carried by agricultural products to feed the animals in one country and the spread of diseases will come about.

I also did not know before about the figures of price destabilisation. When the surplus is more than 20%, then the price will be reduced by 50%. I think this is very good information that I can take home.

DR. U-WHA CHUNG, MP (REPUBLIC OF KOREA):
Here is one paper, for your information, about our Korea's population issues, so please take it for your country as your reference, which is the current focus on population in Korea. I'd like to give two comments. One is that, in spite of the globalisation, the main food products should be protected themselves in each country before the significant decrease of their main agricultural products. Particularly because the market price of foods, like rice and wheat can be increased by advanced developed countries. The other is, yesterday the topics of the population carrying capacity was very, very interesting to me. As key speaker, you already mentioned about the impact of globalisation for food. Globalisation is the mainstream, which we cannot break. However, it can give us more deep and wide information about population and development. As you know, the growth of the population of China, India, and some Southeast Asian countries is so rapid and significant. But why we must be more directly concerned about population carrying capacity of each country in the near future, as well as Asia. Thank you very much.

MR. HOLLIS, MP (AUSTRALIA):
We are often told that globalisation is inevitable. And I've actually heard it here at this conference. And we're also told it is not so much globalisation as such, but how the benefits are distributed – that's the important issue. From my own personal perspective, before we get too enthusiastic or pessimistic about globalisation and its benefits, or otherwise, we should start by looking at fair trading practices. I would be worried if the food was the monopoly of one country or indeed the monopoly of some multinational conglomerates. Australia and, I think to a lesser degree New Zealand, but Australia has suffered through the inefficient agricultural practices of Europe, and through the heavy subsidies paid to European farmers. And we've also suffered very much from the United States farmers, because what happens in Europe and the United States, real produce such as

grain and others, are heavily subsidized. It pays the farmers to produce as much as possible. And when they cannot dispose of what they produced, it's dumped on a traditional market. About five years ago, Australia, after many years, had developed a market for grain in the Middle East. The Americans had a surplus of grains. They disposed of it in the Middle East at prices less than it cost to produce. So consequently all the grain went there. The producers in Australia then were disadvantaged, at a lower cost, and also moved out. Now often these dumpings, and both the European Economic Community and the United States are guilty of this, it's usually a once-off. They're not putting that grain there at that price every year. They'll put it there one year, that will destroy the producing market, and then they will move out. And so the recipient country loses, and so does the producing country. So if we are going to talk about globalisation there, we should look at fairer trading practices, and most certainly make sure that there's not a monopoly or one country or one multinational holding us all to ransom on food or other issues.

MODERATOR:
I think this is a very good example of how fair trade has been affected by some loopholes in the policies, especially when we find this in WTO. I know that the U.S. has this program, I think, which can dump the grain to anywhere that follows the policy there. So in countries like Australia, really you have that big problem that we have to take into account.

MR. SHIV KHARE (AFPPD):
Just further to what Colin said, why in WTO this arrangement has been made under the name of most probably free trade or globalisation? The country, which produces a sufficient item for the need of their own country, why they are forced to open the import of the same item? This is purposely to support some countries so that, you know, they can get benefits, or dump these subsidized foods? In my opinion, the countries, those who have sufficient foods of their own, why they should be forced to open their markets?

MR. HOLLIS, MP (AUSTRALIA):
That's what Australia always argues about. We want to compete fairly, and we argue that where the American grain farmers are heavily subsidized, and the European Economic Community supports, and anyone who has had a look at agriculture in the European Economic Community, it is the most inefficient agriculture in the world. And we are saying that by fair-trading we should be able to compete on fair levels. But when you've got your farmers very heavily subsidized, it's not fair. And also, when through that inefficient farming method you produce surpluses, you then flood other countries' traditional markets, we also don't think that's fair. So all we are asking for, to use an Australian term, is a "fair go" on the international market, no subsidies, and no special deals.

MS. BUNKLE, MP (NEW ZEALAND):
I want to address this point, because it seems to me that the opening of these domestic markets to international competition through WTO rules is quite simply an affliction of the extreme ideology of competition. That's how it's supposed to work. But I want to alert you to the fact that the latest round of negotiations under the GATP, not the GATT, but the GATP, would apply the same rules of competition to open to competitive tender for all social services, including things like health services, family planning, and so forth to international competition. That's the next set of rules. Including educational services, its libraries, museums, anything, under this new set will be open to the same competitive rules, and the single exception is public services, which are a state monopoly and provided completely free. So it's simply the next step of the privatisation and extreme competition agenda.

MODERATOR:
You brought down this GATP, those objects go into YATS, is really a very big effect to, I think, all of us developing countries, and that is why you see in Seattle so big a demonstration against the WTO, and then the last time in Davos. Even in Davos they also had a very big demonstration there, in order to call the attention of the big powers, but especially the trans-

national companies of these big countries. When it comes to services and industries, industrial development when they come in the country freely, then that is the end of the local services. I can see that now, like in Vietnam we have this Internet service. The telephone service is still monopolized by the National Posts and Telegraphic Authority. It's charging quite high, but if, say an NTT or AT&T will come in, I think that's the end of our posts service, because the price that will be provided there will be much cheaper and more efficient. This is something that we have to take into account.

MS. NAPSIAH OMAR, MP (MALAYSIA):
I think, Mr. Chairman, this is one of the questions that we cannot provide the answer. I can't really answer. What Colin says is quite true. Dumping is going on. And Mr. Khare also asked, why are the markets open? And I think what we had seen earlier about globalisation, we are seeing it now, the effects of globalisation. Well, the rich will get richer and the poor will get poorer. Unless someone is willing to take that giant step to make these changes for the better.

MODERATOR:
I would say that globalisation is already there, like Dato' Marimuthu said earlier this morning. But the new dimension is now with WTO, with YATS and with others, with AFTA and so forth in the Asian countries. So with this, of course, we cannot avoid it. As I see it, we cannot avoid it, it's already there, and it's coming. So now how we can handle it with skill? The honourable Yatsu may have some idea about these WTO things.

MR. YATSU, MP (JAPAN):
I do not say this because somebody talked about WTO, but I have directly involved in the negotiations of WTO. I was one of them. And until there recently, I was together with Hon. Moore, the Secretary General from New Zealand, and we have continued our negotiations, and also I have discussed these issues with representatives of the United States. In those terms, according to Article 20, the issue of those services has actually also been considered. And for the first issue, we have to think separately from industrial issues. In Japan, too, on the 22nd of December we made our recommendation, and when all the proposals had been submitted from the various regions, on the 5th and 6th of February, there was an explanation in Geneva concerning the proposals put forth on different countries. And there were quite a lot of discussions that followed the proposals, and I was also there myself in person. The most important thing is that field agricultural products are different from industrial products. And that from the issue of food security has become one of the most important topics of our discussion. What we can think is that in relation to trade, there are importing and exporting countries, and there is an imbalance and an unfair situation existing between them. The importing countries, there are the Cairns groups, and if they cannot export from these countries With just a simple notification, that they say that they cannot export, they can stop exporting. But importing countries are obligated to import. And we think that we need to really heal this imbalance between the exporting and importing countries. This is what we came to as a conclusion.

And another big discussion was about comparative advantage. We can actually provide foods with a reasonable price, and therefore we can actually import food and secure food. That was the topic of discussion then. But as we have mentioned several times here at our conference, if that happens, we would actually have a colonization of food-producing countries. And therefore we would have to, to a certain extent, secure food to be self-sufficient to a certain extent in our own countries. And this was a discussion that went on in Geneva as well, and I personally feel that this is a very important issue as Mr. Shiv Khare commented, why, even if we have a surplus in our own country, why must we import? And we can really cite the rice example of Japan. In Japan we have actually stopped production by forty percent of rice in our country, but nevertheless we have to import rice, and this has become a very big issue in my country. But this is within fair competition, and therefore Japan also will really have to import a certain amount of rice with minimum access quota put onto it. But this is a very critical problem in our country. So from that perspective the issue food has been defended in the GATT Uruguay round, and we even talked about this, and it was continued on to the

WTO. But we have to look at a different angle in discussing things so we will be able to establish food security in our own respective countries. And this is the negotiation that is going on in the WTO, and it is really a conflict within the Cairns groups.

The United States, in the negotiation of the GATT Uruguay round, really feel that they have won, but about three to four years ago the agricultural products of the United States fell dramatically in prices, and the farmers of the United States are really now in the situation where they cannot really produce again. And two years ago, they had about 7.5 billion dollars, and also last year a billion dollars subsidies. And they themselves have said they must not have the government subsidize heavily like this, but they have to subsidize their farmers. Now EU also says that they are also looking into lowering the subsidies, but they are subsidizing the farmers in exporting at lower prices, which also calls for a lot of criticism, and I feel that this would be the biggest discussion point for the next WTO round of talks. From that point of view, as a Minister of Forestry, Agriculture and Fisheries, I also proclaim that, within the responsibility of each country, that we must secure food. And especially the staple foods should be produced in one's own country, what was mentioned this morning, but from the food security point of view, we must produce what we can produce in our own country, and import through trade whatever we do not find sufficient in our own country. This is what I have been saying in the Friends group, the group we are really calling and appealing to.

MODERATOR:
I think other countries also, especially the developing ones, we also take this stand. I myself also take this stand with the YATS, that we should exclude food and agricultural products from most of the negotiations. Otherwise it will disturb so much our farmers in the country. Well, in the case of Japan, you know that Japan wants to be self-sufficient, to have the right to produce in Japan. So there is no reason why some other country imposes, and asks Japan to import something that they are already have satisfied. But looking into another aspect, we also have the trans-national companies. Now they own many seed companies. They will produce higher-yielding seeds using all kinds of modern technology, including the GM seeds. And when they bring these to our country, because of this YATS agreement, we have to buy this. Our farmers, if they want to use it, they have to buy these seeds. And we cannot multiply them for the next crop, but we have to buy them anew every time – this is really bad. And this is something that we really do not want to be included in these GATTS negotiations. So we are really much on the side of Japan in this aspect.

DR. SURAPATY, MP (INDONESIA):
The globalisation is unacceptable, I agree. But, you know in discussing population problems, we have to have some definition of sustainable development and globalisation. The globalisation and development that we discuss right now is from the economic point of view. Why don't we discuss from the human development, because population must be regarded as object or subject of development. So that is the single one, I say.

The topic says Globalisation in Sustainable Development, the Future of Asia and the Pacific. Do we have a future because of globalisation? When we do, how? When we do have a future, how to make globalisation as a benefit to all developed and developing countries? Like this morning we discussed that there is an inequality in the liberalization of trade, disparity of income among the developed and the developing countries. So the professor in the paper of Professor Marimuthu said that the liberalization of trade right now will benefit the developed and developing countries. So I would like a comment from the panelists about how to make the globalisation more benefit the developing countries.

DR. SAMEJIMA, MP (JAPAN):
As Mr. Yatsu, the former Agricultural and Forestry Minister, has mentioned, with GATT's current attitude it is not possible for the developing countries to actually reap the benefits under the current GATT system. Therefore we have to have more provisions within GATT's agreement that will safeguard the developing countries. With such unilateral agreements, it will be very difficult to

provide benefits to the developing countries, I think. One possibility is that, globally to have a set standard price, a world global price will be integrated. And the middle-scale farming is the most difficult, which will face the problem in the U.S.. And the big-scale farming to compete with them, they will be the native and small-scale farms. They can actually fight with these big-scales, which means that it is not a commercialised agriculture, it will be an agriculture which will support the life itself, which is cut away from the international agriculture. This is, the subsistence agriculture will live on. So in that sense, in Japan, every year we provide a huge amount of ODA. We can support the subsistence agriculture, not the commercial agriculture.

How effectively can we conduct this subsistence agriculture? This will be something away from GATT. We can form different types of corporations other than that of GATT. So this is a little bit indirect explanation.

MS. NAPSIAH OMAR, MP (MALAYSIA):
If I can make some contribution, I'd like to share with you what we're doing in Malaysia right now. I think the government is making preparations to prepare the small farmers to face globalisation. What we have done is now to integrate the small farms, so that they become bigger, and that with a bigger farm size, we hope the management will be able to increase their production of the bigger farm. That is one of the things that I think we are agreeing right now.

MODERATOR:
I think what we can say here, as you have just heard from Japan and also from Malaysia, in my paper this morning I also mentioned that the big countries, mainly, are controlled by their trans-national companies making pressure to their representatives in the WTO negotiations. So in these negotiations, although the U.S. are the representatives, but in fact they are talking for the interests of the big companies in their countries. This is the same with European countries. Of course, we do not want that these companies will go bankrupt. They must have benefits, then they may have profits. So what I was thinking is that possibly the donor countries, the countries supporting those companies in their international aid programs, they should give more attention to the rural development and also to the education and training opportunities for the women, for the rural folks, and also training for people who are involved in other services in the developing countries so that they can quickly mature and stand up, in order to be able to work with the other companies. This is one way, the second is, in the negotiations the big companies or the big countries should also have to consider the national heritage, the national values, the national policy so that with these considerations they may have some exceptions in the various articles in the WTO. Otherwise, if we go straight without consideration of the culture, of the national policy, and so on, then it is very difficult for the countries to get together on the agreement, and the discussion will continue forever. So I think that is the best that we can give the answer at this moment. Maybe some other time others or we may have some better ideas to come up with.

MR. SHIV KHARE (AFPPD):
Mr. Chairman, I don't agree with you. Because your suggestion is that we again go back and beg the donor countries to give more money as a donation so that we can do all kinds of rural development. On the other side, why can't all the third world countries go to GATT and stop over there? So that the countries, those who are currently self-sufficient do not become poorer. Because what is happening, as Thailand has just realized this with the new Prime Minister, and the new Prime Minister, who himself is a very rich man, and most probably has become rich on the basis of globalisation, is talking about now, he says, look, we cannot go on importing things to our country which we don't need. So we will have to put some restrictions. So therefore the countries, those who do not need things, why they should be forced under the name of fair competition, should be forced to import, like India? India is self-sufficient, for they even don't know where to put the food, where to park the grains. Now they are forced to buy the grains from outside. So slowly, slowly the local farmers will die, and then the whole farming system, which has been in development for fifty years, will also collapse, and then they will become dependent and there will come to be a monopoly in the country

where you will have to import everything. So why can't we fight out these thing on this forum where the third world countries have the majority? Why should we have this begging attitude, no, no, we should beg them to give us the money and give us more donation so that we develop our own people to fight them? So people are already there to fight them, why can't we fight? Thank you.

MODERATOR:
You have a reason there. But I'm afraid that when fight straightforward, they can also come back again and fight again, and they don't import our products. So they will say, oh, you don't import our products, why should we import your products? And this will come to a standstill, and that will be difficult. That's why negotiations have to go on. Our delegate from China, do you have any question about the WTO? No? Okay. From India? Please.

MR. LAKSHMAN SINGH, MP (INDIA):
We have discussed the issues a number of times, over and over again, the problem of food security, WTO, GATT. It is time that all of us sit together and make an action plan, and then go for negotiations and then put pressure on them to implement their action plan. That is my suggestion.

DR. MARIMUTHU, MP (MALAYSIA)
Listening from the comments from the floor, it is very clear that we are not very, very clear about the whole concept of globalisation and free trade. And the whole concept of globalisation, and particularly free trade, is that we should have freer and fairer trade, unaffected by trade across international boundaries. That is, I think this would answer Shiv Khare's question as to why, if a country is already producing food, and an excess and surplus food, why should they be forced to import grains, or whatever cereals? I don't know the situation, but in theory the countries which are producing the grains, if they are producing in a very inefficient manner, then they will be requested not to produce; they will be given a letter. For example, Malaysia, I think that if we compare it with Vietnam or with Thailand, we are inefficient producers of rice. So we are better off producing oil crops, palm oil. And so this would be the sort of comparative advantage that we are talking about.

The other thing is, if we, you know, in the negotiations, if we produce only palm oil and not produce rice, the question is what happens if something else happens to Thailand and there is a disaster, a natural disaster, or whatever, and what will be the question of food security? And so, in theory, I think the negotiations are still going on, that you will have each country producing goods or commodities, that they have the skills and the best comparative advantage, I mean, this is in theory. But politically, I think in India the farming community, if they haven't been told not to produce certain goods, wheat or maize or corn, and they have been producing traditionally for hundreds of years, what are the political and social implications? The same thing with Malaysia, the rice-farming community is a community that supports the government. And if they are displaced, what will be happening to the political spectrum? So these are some of the questions that we will have to look at, and perhaps the negotiators will have to bargain and get a balance of self-sufficiency vis-à-vis comparative advantage. Theoretically, if the European farmers and American farmers are heavily subsidized, especially if they get an export incentive, then if the Australian farmers are producing the same goods in the most efficient manner, in theory, the Australian farmers will benefit by globalisation and free trade. But it is a matter of the agricultural agreement that has already been done and then is continuing to be negotiated.

MODERATOR:
But I would like to call your attention to the fact that in some countries the concept of comparative advantage could not work. Because of the fact that it is the policy in the country to keep alive some sectors. I take one example, Japan. In Japan, because the main policy is to have rice produced in Japan, so in order to give incentive to the farmers, they increase the price of rice every year; it is increased all the time. So that for the farmers it is better to grow rice than to do something else. And therefore, when the Australian farmers or the Californian rice farmers look at the price of rice in Japan, they say, ah, it's better to sell there, because it is there four thousand dollars per ton, why here

we sell it only at three hundred dollars. So it is forcing Japan to import rice. And we cannot say that we have to use the comparative advantage of California or Australia where to grow rice is much cheaper, because the rice sector in Japan would be destroyed if the rice would come in. The same thing in India.

DR. MARIMUTHU, MP (MALAYSIA):
That's a point, Mr. Chairman, I mean all the subsidies and the tax, what systems are left to go? And I don't think the American farmers will sell, at that point, at the price that the Japanese farmers are getting, because Japanese farmers' rice is supported by the government, so as to keep the farming community. And this is a political consideration, whether you want to keep, at what percentage of the farming community do you want to keep and what percentage of self-sufficiency you want to attain. These are questions that have to be negotiated.

MODERATOR:
I think Minister Yatsu may make it clearer. Actually, I know that in Japan the government does not support the farmers directly, but help the price scale, so the whole society supports the rice farmers, not the government alone.

MR. YATSU, MP (JAPAN):
Well, with regards to the rice, direct subsidizing is against the GATT rules and WTO. It's a yellow card. So the government does not provide subsidies, hardly any subsidies. But rice production has been dropped by forty percent, and so the government does subsidize, because the farmers have been asked to stop cultivation of rice. But we have begun this year, because this is really against the WTO rules, reviewing this policy, so we do not provide direct subsidies. But for most of the Japanese farms it's easier to produce rice because it can be cultivated in a relatively short time. So the Japanese subsidization has supported the rice production, and so we tend to have excess production, which will bring down the prices of rice. And so the government has guided the farms to reduce the production by forty percent. And so the Americans are saying, ours is cheaper, so buy our rice. So I think although 760 thousand tons of rice is imported, hardly any Japanese is eating that rice. It is being shipped outside of Japan for relief somewhere, or making rice cookies out of imported rice.

DR. SAMEJIMA, MP (JAPAN):
We just heard Mr. Yatsu explain how the system works in Japan, but let me add one thing on the technical aspect, about the technology. In the last thirty years we have been transferring the technology CGIAL. This is the green revolution model that we have exported and experienced, in the last thirty years. This is the only technology that we have experienced, but if you think in terms of ecology, environmental protection, this green revolution CGIAL model has not been up to the optimum. Professor Uchijima talked about the input of energy and output of agricultural products, and the balance of input and output. The agriculture can be the energy-producing sector, but in the green revolution system, it is depending on fossil fuels, it is consuming energy rather than producing energy. So we're just wiser today. Do you think there is another alternative? I do believe that there is an alternative, an option. In other words, not be dependent on fossil fuel energy, and reduce the consumption of fossil fuels to a traditional level, and improve the productivity of agriculture. And I was an engineer, an agro-engineer, but we avoided tackling this problem. And Dr. Xuan yesterday said that we may have research galore, but that's not benefiting agriculture, and I think that he's exactly right. We have only experienced the green revolution, and we have not thought other alternatives. And I think the planet Earth is giving us a warning signal. We should be looking for something else than the green revolution. Because traditional agriculture, the Yucatan in Mexico, the Indios, the way they produce corn. For the last five hundred years, that is, they have not used a single fertilizer and have been stably producing corn. The Pygmies in the Philippines rice terraces, for the last two thousand years they have used no fertilizer, and they have enjoyed a stable production. I think we may learn from these ingenious technologies, and find the second green revolution, the way of the green revolution. And I think we have much to learn from the Earth, and if we do heed what the Earth might teach us, then we might come up with a third way or the second

revolution.

As for the concept of competition in globalisation, the quality is something that must not be forgotten. Those of you who have consumed Japanese rice, must have noticed that Japanese rice is very sticky and very sweet, and the Japanese love the stickiness and sweetness of Japanese rice. So the Japanese think this is the best rice. So even if the Japanese rice is five times more expensive than the world's market price, the Japanese would buy that, because it's the quality that some people want. So perhaps quality should be managed, and a focus on quality could be an important advantage in international competition. So I just talked about those two aspects of technology.

CHINA:
It is of greatest significance for the forum to discuss food security and water resources. You have put forward many valuable suggestions. I want to say that the Chinese National Peoples' Congress, and especially the Education, Science, Culture and Health Committee and the relevant joint efforts with other congressional committees supervised and influenced the government actions in the issues relating to food security and water resources. We have attached great importance to this issue and many tremendous efforts have been contributed to this regard. We have taken actions to fulfil our commitment. First, in legislation we enacted a series of laws, mainly the law on soil management, law on soil conservation, the law on agriculture and the law on the application of agricultural technology. Last year we have enacted the law on seeds, to ensure the spreading of high-quality seeds. After researches and investigations, we are now considering the formulation of the law on prevention and management of sand, which aims to curb the so-called sand storms and the degradation of arable land. About this effort, its purpose is to ensure food security and for the utilization of water resources. Second, we launched the investigations and implementations of established laws. In the recent years, especially in the last three years, we launched an investigation focused on the law on soil conservation, the law on environmental protection and the law on soil management. We pushed the governments at different levels to act and to stick to these laws, and to make efforts to ensure food security and conservation of water resources.

In the outline of the tenth Five-Year Plan we have set many concrete measures in the field of agricultural development. And certainly we have made many recommendations to the government to invite their following actions. The Deputies of the National Peoples' Congress every year will take up many suggestions. In recent years we, the government took many concrete measures, and listened very carefully to the deputies to the Congress. For example, we ask for a comprehensive ban of deforestation of natural reservation forests, and to ban exhaustive hoarding and illegal gathering of plants for medicinal use. And with the situation that we have from the food surplus, we subsidize the farmers to plant trees in their farmland instead of cultivating their land. We have also enacted many decrees on conservation of water resources, and to avoid exhaustive poaching to protect the grasslands. The government is going to increase their capital input in the project to divert water from the south of China to the north of China. That means, to divert the water in the Yangtze River to the drought areas in the north. It will be a very complex and far-reaching project. We vigorously developed the water-efficient industries, and at the same time we curtailed the over-growth of population. We made many efforts to develop a more efficient agriculture. And the forum AFPPD has done many works in these twenty years' development. We have learned a lot through every delegate attending this meeting.

DR. SOMPHONG MONGKHONVILAY, MP (LAOS):
I agree with Prof. Xuan that globalisation is already here at home. And particularly for the least developed countries, we have so many difficulties to compete, particularly those who have a per-capita income less than three hundred or two hundred US dollars, something like that. So I think we talked a lot about how we can sustain having our economic development. I think globalisation does not only influence on the economic front, but also on the social front. Because when it comes, people talk about westernisation of your culture and some other things. I think when you want to cope with something you should have a vision. I think a vision, and after that you should have well-prepared

planning. But I think for the ASEAN countries, they have the vision, I think for 2020, something like that, and from that point, from that stand I think each member country has its own, or tries to work out its own vision for 2020. And the vision for 2020, I think, should be based very much on your assessment of your own country, what are the potentials in your country you can do for agriculture, what are the potentials you can do for industry, and what other things you can do so that you can by, I think, a five-year plan, maybe call a short, a medium-term or long-term plan. You can put the objectives step by step.

That is why I think that planning should be the tool for every country to cope with in all the ways as we discussed, and at the final stage, we [end of tape] parts, and also particularly from the developed countries, we also need financial and technical assistance from abroad. That is why I think I agree that we should deal with globalisation with skill, with consciousness and with very good planning tools, so that we, for example, for this period, see what we can achieve. Because people tend to hunt for very fast, very high growth, people talk about how we can reach the highest GDP, and also the GDP per capita. And some developed countries allow the trans-national companies to come, in the hope that they can get some benefit from these trans-national companies. But at the same time I agree that we should have our own legislation, otherwise we cannot control, and whatever they are very good, these trans-national companies, but people in these companies tend to reap more and more benefits and they forget sometimes that they should give back the benefits to the countries where they invest. That is why I think planning is a tool for reaching your goals, and investment comes as second things, but investment comes for the government, what do you want to invest in, in government investment? And private investment, what do you want them to invest in? And here, I think, the government should play the role, and the parliamentarians should also try to promote the government to have the required legislation.

INDIA:
When we are discussing the effects of food security through them, it is most appropriate to discuss WTO, which is affecting the present situation in this regard. I totally agree with my leader of the delegation and Mr. Khare that with this situation it is very essential to draw up a plan of action, this is absolutely correct. And what Mr. Khare has suggested, that how we can expect a cooperative hand, cooperation and funds from those countries which in his opinion, and my opinion also, will be responsible for the problem of underdevelopment of underdeveloped countries' farmers. So it doesn't go together. My suggestion is, in the WTO there are provisions, there are safeguards. The parliamentarians of all countries, which are developing, should play their part. That those safeguards, which are provided in the WTO, are effectively used at the most appropriate time. If we care for those provisions, which safeguard the interest of small nations, undeveloped countries, then it will be too late. I must put on record, after signing of this agreement, which is called WTO, in spite of signing by so many nations, even in those nations there are differences of opinion, and there is stiff opposition towards many provisions of this agreement. In my own country, when big multi-nationals have come under globalisation, many small industries, many consumer industries are facing closure because competition is good when it is on paper, as a theory, but when it comes to the practical terms, small people cannot fight the giant people. So national problems are being created.

It is high time, when we have met here, we must play our role. When many nations have signed this agreement, it means some good points are there which will help for the progress and development of the nations. But there are certain points, which are causing great problems for those people for whom this agreement has been created. So my suggestion is that we, the parliamentarians who have assembled here under the banner of AFPPD, APDA, we must play our role effectively and we must watch and guard the interests of our people at the proper forum, and this means with our government and with our parliament.

MODERATOR:
That has been very well stated, and can be used as concluding remarks, as our session has concluded now. I think all of us recognize that globalisation is something that is just like a train, and if we do

not jump onto it, we will be left out. But how will we jump onto it and how will we act in it? So the planning, like the head of the delegation from India has suggested, and it was also seconded by the member of the delegation, I think it is very valid. And we should plan now, especially the parliamentarians who are attending the meeting this time in Auckland, we should make a point that we have now recognized the problem. We can see that there are some potential benefits, but it looks like the challenges are many more than the benefits. Therefore we should be planning for a better position.

CLOSING CEREMONY

Address

Ms. Kayoko Shimizu, MP (Japan)
Vice Chairperson, APDA

Address

Mr. Yoshio Yatsu, MP (Japan)
Chairperson, AFPPD

Address

Dr. Gillian Greer (NZ)
Executive Director, NZ Family Planning Association

Farewell Address

Ms. Anne Tolley, MP (NZ)
Vice Chairperson, NZPGPD

Address

Ms. Kayoko Shimizu, MP (Japan)
Vice Chairperson
Asian Population and Development Association (APDA)

Honourable delegates and participants, we have had the 17th Asian Parliamentarians' Meeting on Population and Development over the past two days, and it was a great and successful meeting. We would like to thank you lecturers for your excellent presentations. And also, in hosting this conference this time, we owe our greatest gratitude to the members of the New Zealand Parliamentarians Group on Population and Development, headed by Ms. Chadwick, and also the members of the New Zealand Family Planning Association, headed by Ms. Gil Greer. It is due to your dedicated cooperation that we were able to hold this conference. This time our theme was Food Security, Water Resources and Population Issues in Asia and the Pacific. We have had excellent ideas put forth over the past two days, and we have also had new proposals put onto the table for us. Population and sustainable development are inseparable issues. But nevertheless, in many cases, and very unfortunately, population's issues have been discussed as population issues, where they are talking about high theory issues and statistics only. And separately, the sustainable development has been discussed from a trade, agriculture and environmental point of view. They were both separate topics, and never together have they been discussed as an issue that decides upon the future of us, Humankind.

When we think about the future of Mankind, we should actually, organically and consistently talk about these issues together. But, unfortunately we feel that it was on very rare occasions that we talked about these two things together. Especially population issues are really at the base of all the global issues. But international conferences, treaties and agreements have never reflected the issue of population in the past. However, in the parliamentarians conference that took place to discuss the 1999 ICPD+5, and in The Hague Declaration it was strongly proclaimed that the actions of the parliamentarians is, to quote, "to promote international trade rules which must be consistent and well-coordinated with a long-term perspective on food security." Now when we think about the future of our society, and when we think about human security, we must take up population issues which are, themselves, related so closely to trade commerce, and international issues. And when we must actually look at the future of mankind, we must really put this into the forefront to decide on our international agreements. These are logical and reasonable and common sense. Why did we not discuss them together in the past? We are parliamentarians, so involved in national politics, and supported by the people of our country. The meaning of us parliamentarians to be involved in population issues is for us to really find a way for Mankind on this Mother Earth, and each people in each country can actually live in a good way. We must think what is the best lifestyle that we can actually lead, and what are the countermeasures that are best for the people of our respective countries.

This is a responsibility that we parliamentarians have on our shoulders. We have to look at the future of Mankind, and we have to look at the future of this planet Earth to really come up with integrated countermeasures, and also to be able to should good, strong leadership. We have to look at this world, where we can live with dignity, in a good society. We must join hands together to work towards the same.
The next APDA conference will be taking place in Tokyo during the very beautiful blossom season. It is twenty years since APDA was first founded, and this meeting will be held to celebrate that twentieth anniversary as well. We look forward to inviting you and welcoming you to Tokyo at that time. We are all very, very happy to have been able to hold our conference here in this beautiful city of Auckland and once again I would like to thank you all from the bottom of our hearts. Thank you very much.

Address

Mr. Yoshio Yatsu, MP (Japan)
Chairman
Asian Forum of Parliamentarians on Population and Development (AFPPD)

Ms. Steve Chadwick, Chairperson, New Zealand Parliamentarians' Group on Population and Development, Ms. Kayoko Shimizu, Vice-Chairperson of the Asian Population and Development Association, honourable delegates and lecturers, we would like to thank you for your cooperation over the past two days, and for your active participation. And also we would like to thank the New Zealand Parliamentarians' Group on Population and Development, headed by Ms. Steve Chadwick, as well as the New Zealand Family Planning Association, headed by Ms. Gil Greer, for your dedicated cooperation. Thank you very, very much indeed. And I would also like to take this opportunity to thank Ms. Kayoko Shimizu, Vice-Chairperson of APDA, as well as the Executive Director Mr. Tsuguo Hirose, and the staff of APDA, that I would like to thank all of you from AFPPD for your dedicated contribution to make this a very beneficial conference.

This year is the fifth year since the World Food Summit, and there have been many activities that have been going on. Actually there was a public commitment made in the 1996 Food Summit that the hunger rate will be reduced to half. However, that has not been realized. In fact, it is increasing. And on top of that, the world population has focused its increase by seventy million people every year. And, at the same time, the environmental food production increase is getting worse and worse. New arable land is also so difficult to find, and also forest resources are on the decline. The desertification, as well as salinisation, and also soil erosion is becoming a very serious problem. We actually have to pump water from the river in order to irrigate for the purpose of increased food production, which actually makes the rivers never reach the sea to really flow their waters out to. And it has really made a very serious impact on our maritime resources. Now, freshwater resource, which is a scarce resource, is also becoming a very big problem because of this severe condition that surrounds our food environment.

So from all that point of view, the topic that APDA has chosen for this conference is Food Security, Water Resources, and Population in Asia and the Pacific. I feel it's a very timely topic that they have chosen. We have a great author in Japan, called Natsume Soseki, and there is a novel that he wrote, called Pillows in the Grass. There is a passage that I would like to quote from that: "Secure on one's act, through one's intelligence, it would arouse bitterness. Should one actually be guided in the streams of the tide of times, we would drift away. This is very difficult to live in." This is really a pessimistic analysis of this world, and the Japanese people know this very well. But the passage goes on in the following way: "It might be a difficult world to live in, but if it were a world of brutes, not of men, it would even be more difficult to live in." This is really a very cruel pessimistic analysis of the current reality, yet the author faces it, affirming that reality.

I think we politicians are in that same situation. The society that surrounds us is really developing the intelligence and technology and negotiating information together through technology, but on the other hand, there is bewildered confusion in our world. The Internet has been spread throughout the world, yet hunger and conflict never cease in this world. The topic that we have chosen, which is Population, Food, and Water Resources, we also have a very, very pessimistic situation that we are confronting. Therefore we need to look for a way in where we can hopefully live in this world. We must not only rely on comparative advantage, and apply our international rules in trade. It might be, in the short term, very reasonable and efficient, but when we look at the increase of population, the degradation of our environment and water resources, and the constraints that are put on all our resources, I don't think we can really say that a comparative advantage can really guarantee us a future. When we look at food, this is really essential for people. We cannot live without eating for

many years. So when food ceases to be supplied, we will have to really think of another way out. And the disadvantaged countries will lose their agricultural production, in addition to losing their infrastructure for their production of agricultural products. When population increases, and where there is less of a reserve, and when exporting countries cannot export anymore, what must we do? Those countries that are importing countries will have no more food coming into it. Those countries that are disadvantaged in food production, they cannot import only when they need to import and really stop production. Once you stop production, it means that you lose the basis of all agricultural production. And how optimistically you look at it, that infrastructure production will take many years be recovered. Man cannot live without eating. And therefore, each country must actually be able to secure food in a responsible way. In that case, if the importing countries have economic power, they will deprive the food from developing countries, and would actually drive those developing countries into starvation.

And for those developing countries, the poor people in these countries can only wait in hunger for assistance to be given to them. Can we call this a fair situation in the world? No. Mankind must be at the centre of all this action. This is the basic principle of AFPPD activities. And therefore we must not take in economic principles as our international rules, but we have to look at the future of our population; we must look at the possibility that we have in the future and we must apply all that into our international rules. In 1994, AFPPD hosted an international conference of parliamentarians on population and development, and we have been talking about the necessity of putting man at the core of our activity. The Hague declaration that followed has actually been adopted at the United Nations General Assembly. And we feel that what we advocate for has actually been acknowledged on an international level as well. Our fellow delegates, who are here, you are representing your country, and you all have different situations that you bear on your shoulders. You must think of what is the most optimum policy for each of your countries, because there are differences. However, when you actually plan different policies in your own country, please take into your policies population issues, although they might be pure economic issues. We are really acting for the people of our own country. So we must look at the future of the people of our countries. And also the future of the planet Earth is something very, very important to us. So we must not leave and turn a blind eye to the future problems. And we have to really disseminate the activities that are going to the electorates, the people of our country, to each of our governments, and to the international community so that our future generations will be able to live peacefully in this irreplaceable Earth. We must look reality properly, squarely in the eye, and make judgments with calmness and with hope, so we may make our future full of hope for all of us.

In closing, I would like to mention that this APDA Conference was held in this very beautiful city of Auckland, and that we were given this opportunity to talk with the people of Asia and Pacific countries. AFPPD is very, very happy to have been given this opportunity. I firmly believe that the fruits of this discussion will be really something that we will be able to share with you. And I think that we are accomplishing the mission of AFPPD step by step. Thank you very much for your very kind attention.

Address

Dr. Gill Greer
Executive Director
NZ Family Planning Association

Senator Mrs Kayoko Shimizu, Vice Chair, Asian Population & Development Association and Secretary General of Japan Parliamentarians Federation for Population; Hon Mr Yoshio Yatsu, Chair, Asian Foundation of Parliamentarians on Population & Development; Mr Kunio Waki, Deputy Executive Director, UNFPA; Mr Shiv Khare, Executive Director, AFPPD; Ms Anne Tolley MP, Vice Chair of NZ Parliamentarians' Group on Population & Development; Distinguished Members of Parliament and Academics, NGO Representatives and Volunteers, Ladies and Gentlemen.
Thank you for giving me the opportunity to speak at this closing ceremony.

Firstly, as is our custom, I would like to acknowledge the people of the land, the tangata whenua, the Maori who are the indigenous people of New Zealand/Aotearoa – it is on their land that we meet - and also to acknowledge their ancestors and yours who have been the guardians of the planet we have inherited together and who have brought us to this point in history.

The Maori language and culture are rich in proverbs and one seems particularly appropriate after listening to your discussions for the last two days.

"and I ask the flax bush what is the most important thing in the world?"

"and it answers: he tangata, he tangata, he tangata – it is people, people, people."

In the last two days you have discussed people's rights to food and to safe water, the rights to live their lives free from disease, to be educated, to choose the number and spacing of their children and to live their time on this earth with dignity.

In February 1999 I was fortunate enough to be an observer at the Hague ICPD + 5 Parliamentarians' meeting where over 200 Parliamentarians, including many of you, from 103 countries, met to discuss the implementation of the 1994 Cairo Programme of Action.

In that beautiful wooden Parliamentary Hall, as the snow fell outside, I was privileged to hear the world's leading decision-makers, individually and collectively, reaffirm their commitment to the principles of the Cairo Programme, and its vital relationship to food security, the environment and economic issues, and to reproductive health and rights. My New Zealand colleague, Professor Poole, commented that he felt the Cairo Programme had far too great an emphasis on reproductive health. As you can see, in the 5 Year Review there was clearly emphasis on a wide range of issues, as well as reproductive health and rights, but nevertheless it is important to remember that reproductive health and rights must remain a central issue until all women are able to exercise those rights and until men are also involved in the shared responsibility for family planning and reproductive health.

In the Hague Declaration, two years ago, Parliamentarians at The Hague re-committed themselves to actions which included the removal of barriers to the empowerment of women, both as an end in itself and as an essential strategy in achieving sustainable development both nationally and globally. In their declaration they also went on to express their intention to ensure that all governments should give higher priority to the social wellbeing of adolescents, youth, the elderly and persons with disabilities, and their determination to ensure food security, through the removal of trade and non-

trade barriers and through collective action to mobilise resources and to persuade governments to re-evaluate debt repayment.

They particularly committed themselves to working together in a global network of Parliamentarians on Population and Development, calling on all Parliamentarians to play a more active role in monitoring progress against the ICPD goals for population and development.

Your meeting here on these two days, on the other side of the world, as representatives from Asia and the Pacific, is part of that brave ongoing commitment, though instead of snow I am afraid you have rain and wind!

And we are very pleased that you chose New Zealand and the Pacific for this 17th APDA meeting. Although its population is small compared with Asian countries, the Pacific is in many ways a microcosm of many of the world's population and development issues, as you have heard from the Honourable Winnie Laban, Dr.Chris McMurray and the Hon. Member from Samoa.. These small nations each with their own rich heritage and culture are often forgotten, yet one has a birth rate of 7 children per woman – as high as that of some African countries. The ravages of HIV Aids which have swept Africa, Asia and parts of eastern Europe are now a rapidly increasing reality in the Pacific. In some Pacific countries 50% of the population is under 15, with huge implications for momentum growth. In one 70% are illiterate, in another 2000 young people leave school every year to compete for less than 300 jobs; internal migration places urban areas under increasing pressure, and women's education and empowerment are sometimes a low priority particularly at times of civil unrest and economic crisis. Furthermore the sea, land and eco systems that have sustained the people of these nations for centuries, in spite of **natural** disasters, are now under serious threat, for reasons that are far beyond their control. So, it is not just the livelihood of people that is threatened but the actual physical existence of their country.

And even in New Zealand, a developed country, where everyone should have access to food and welfare, there are many inequities and issues related to health, population and community development that we have been too slow to address. These have resulted in lower life expectancy and poorer health outcomes for Maori and severe social deprivation and repeated poverty cycles with areas of 4 generations of unemployment which can be objectively measured. There are similar issues for many Pacific nation migrants.

New Zealand has led the world in our legislation to prevent domestic violence but sadly this is not the reality for many women and children. We have high rates of unplanned teenage pregnancy and sexually transmitted disease. All this impacts on population health and the wellbeing of individuals – and our society.

At their Hague Conference, Parliamentarians urged Governments to implement ICPD by working in partnership with members of civil society. I am proud to be here as a representative of an NGO, and one that is affiliated to IPPF. I believe that NGOs with their volunteer spirit and independence can bring passion, energy and commitment to make that a truly effective partnership. Two government studies in New Zealand published in the last few weeks seek to lay down the principles of that important relationship and to recognise the value of the power, independence and contribution of NGOs.

One of the founders of my own organisation died a few weeks ago. Sixty years ago, as a 24 year old, she watched New Zealand women struggling in the great depression, desperate and exhausted, without sufficient food to feed their children, themselves, or their unemployed husbands, without jobs and without welfare relief. Although a young woman, with no political influence, she had a vision that New Zealand women should have the power to decide on the number and spacing of their children. Sixty years later FPA (NZ), working in New Zealand and working internationally in Pacific and Asia, with partner NGOs, is the living proof of that vision, and her son is a member of

the NZ Parliamentarians' Group.

In these last two days, as we have reflected on many subjects and aspects, ranging from the low lying atolls of Tuvalu to the rice fields of Vietnam, we have learnt much together and know that the level of human population and the scale and intensity of human activity and consumption have reached a point where we are dramatically affecting the very resources upon which human life and wellbeing depend, and it is of course, the young people of your countries and mine who will inherit our responsibility for ensuring that humanity does not exhaust our planet's limited resources. There are 1 billion of them – between 15 and 24 in the beginning and middle of their reproductive years – their individual decisions are vital, affecting the pace of population growth and in ensuring that there is adequate water, food and resources. They will need to find new ways to defeat disease and we need to take individual and collective responsibility to fight the battle against HIV Aids, a reality which must be openly confronted, not hidden because of the sensitivity of discussing issues of sexuality and behaviour. No country, including my own, can underestimate this reality, and its increasingly huge impact on woman as well as men.

These young people must join us now as the force for change. I have talked about the Parliamentarians at The Hague. It is also important that we also remember the key messages of the youth representatives of 120 countries at The Hague – one of which was that youth be treated as equal partners at all levels of policy and decision-making. I urge all governments to find ways to give young people an effective voice and to listen to that voice. There is much to be done if their hopes and dreams are to be realised.

Our organisation has been privileged to be able to work with APDA in supporting the organising of this meeting. Thank you for that opportunity. APDA plays a valuable role in so many ways, as the secretariat for JPFP and APPD Tokyo, in its study tours, research publications. And thank you Mr Hirosi and Miss Yuko Kato for their hard work in organising this meeting. . I would also like to acknowledge the contribution of the Japan Parliamentarians Federation for Population which, since its founding in 1974, has led the worldwide Parliamentarian's movement. I would also like to thank the New Zealand Parliamentarian's group and the supporting organisations, the Asian Forum of Parliamentarians on Population and Development, UNFPA and IPPF and Datuk Dr Raj Karim of IPPf has asked me to express her apologies for having to leave early – and thank you for your contribution to the issues.

We in the NGO sector recognise that Parliamentarians are very busy people and I thank you all for taking the time and trouble to travel so far and to discuss these issues. You are the important link between the people and their government and so I urge you to continue this ongoing process of collectively monitoring progress, exchanging information, lessons learned, and best practice. In the spirit of partnership between NGO's and Governments I urge you to turn your personal commitment which brought you here, into collective political action. Only then can there be the political will to promote and support the necessary legislative decisions, advocacy activities, collection of accessible data for decision making, and resource mobilisation to ensure that Governments of the World do meet their obligations to the people of the 21st century and beyond. Without that political will to turn rhetoric into reality and to work together, little can be achieved.

To borrow again from the language and tradition of the Maori people of our land -
"may the sea be calm as green stone and the Goddess of summer dance across your path
- Kia Kaha, Kia Manuanui - have courage – be strong."

Thank you.

Farewell Address

Mrs Anne Tolley MP
Vice-Chairperson
New Zealand Parliamentarians' Group on Population and Development

Honorable Senator Kayoko Shimizu, Vice Chairman of the Asian Population and Development Association, fellow parliamentarians from the Asian Region, my New Zealand colleague Hon Phillida Bunkle, the International Planned Parenthood Association, Family Planning Association of New Zealand, the United National Population Fund, Ladies and Gentlemen. I am not Mrs Steve Chadwick who welcomed you here – she sends her apologies. I am the Vice President of the New Zealand Parliamentarians Group on Population and Development.

The Asian Development and Population Association, since its establishment in 1982 has worked to increase the awareness and promote understanding of the vital issues of population and development amongst parliamentarians in our diverse regions.

This year's theme of Food Security, Water Resource and Population Issues in Asia and the Pacific, has provided us with the expected high standards of presentation and vigorous debate.

Discussions around even the definition of terms such as 'food security" have produced a range of ideas: from the FAO/WHO definition as "access to all people at all times to enough food for an active, healthy life", to consideration of issues such as 'nutritional value' 'distribution', and 'demand'.

The debates around the benefits, threats and/or opportunities of globalization continue, as do the debates around the effects on economies and people of free-trade, and also the effects of migration and technology, including, I was interested to hear today, the very challenging issue of genetic modification.

I am grateful to my Australian colleague, Collin Hollis, for his views on fair/unfair trading practices particularly as they affect Australia and New Zealand – extremely efficient producers of primary products.

Professor Ian Pool, Waikato University, in his paper identified the macro issues of population as size, density, growth, structure, and migration and the micro issues as family structure and family mobility.

Perhaps after these two days we can add Health and Education as Population issues, rather than have them seen as isolated and merely related.

In a recent study of global fertility the demographer Peter McDonald concluded that if the current levels of fertility were maintained they were so low that they would threaten the future existence of the nations concerned. He said "In an era in which we have come to understand the momentum of population increase, it is remarkable that we are yet to appreciate that the same momentum applies to population decrease."

The issue of population decrease confronts as many countries today, as face the continuing problems of large, still growing populations whose very size and nature shapes the sustainability of food security and water resources.

A common theme through the various papers, discussions and points of view expressed here in Auckland over the last two days has been the crucial importance of developing our most precious asset, - our people , our human capital (in economic terms).

As Opposition spokeswomen for Women's Affairs in New Zealand I am extremely heartened by the growing acceptance and understanding that the education of women, and their equal participation in communities, has a direct effect on a country's health – economically, physically and environmentally. Skilled, able women build skilled capable families, who in turn build skilled, capable communities, and our nations depend on such communities.

The aims of the Asian Pacific Population and Development Association are as relevant today in the 21st century as they were in February 1982.

We all understand we live in a global environment, we must talk together, share ideas, concepts, problems and solutions together, as part of the international community.

I know this conference has developed an understanding and appreciation of the difficult task each individual Government faces as it addresses the issues of population and development. Yet if we continue to work collectively, we can make a difference.

Thank you for coming to Auckland, New Zealand. The New Zealand Parliamentarians' Group on Population and Development is delighted and honored to have been able to act as the Host organization. Thank you to those supporting organizations, The United Nations Population Fund, the Asian Population and Development Association, the International Planned Parenthood Federation and the Asian Forum of Parliamentarians on Population and Development, you make things happen!

I wish you all a very safe journey home, and look forward to meeting again in the near future.

List of Participants

New Zealand	Hon. Ms. Annette KING	Minister of Health / Racing
	Ms. Steve CHADWICK, MP	Chairperson, New Zealand Parliamentarians' Group on Population and Development (NZPGPD)
	Ms. Anne TOLLEY, MP	Vice Chairperson, NZPGPD
	Ms. Winnie LABAN, MP	Member, NZPGPD
	Ms. Phillida BUNKLE, MP	Member, NZPGPD
	Ms. Donna AWATERE-HUATA, MP	Member, NZPGPD
Australia	Mr. Colin HOLLIS, MP	House of Representatives, Parliament of Australia
China	Mr. Zhang HUAIXI, MP	Vice Chairman, Education, Science, Culture and Public Health (ESPCPH) Committee of NPC
	Mr. Tao XIPING, MP	Member, ESPCPH Committee of NPC
	Mr. Li HONGGUI, MP	Member, ESPCPH Committee of NPC
	Ms. Li YING	Division Chief, General Office of the ESPCH Committee of NPC
	Mr. Yang SHENGWAN	Division Chief, Population and Public Health Office of the ESPCH Committee of NPC
	Mr. You WENZE	Division Chief of Foreign Affairs Bureau General Office of the ESPCH Committee of NPC
	Mr. Wang DONGQI	Division Chief of Administration and Management Department, General Office of the ESPCH Committee of NPC
	Mr. Liu DEYU	Interpreter of Foreign Affair Bureau General Office of the ESPCH Committee of NPC
India	Mr. Lakshman SINGH, MP	Vice Chairperson, Indian Association of Parliamentarians on Population and Development (IAPPD)
	Mr. Khelsai SINGH, MP	Member, IAPPD
	Mr. Virender KATARIA	Member of Standing Committee IAPPD
	Mr. Manmohan SHARMA	Executive Director, IAPPD
	Mr. Munish DHANDA	Research Assistant, IAPPD

Japan	Mr. Yoshio YATSU, MP	Chairperson, Asian Forum of Parliamentarians on Population and Development (AFPPD)
	Ms. Kayoko SHIMIZU, MP	Secretary General, Japan Parliamentarians Federation for Population (JPFP)
	Mr. Hiroyuki NAGAHAMA, MP	Member, JPFP
	Dr. Muneaki SAMEJIMA, MP	Member, JPFP
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	Sen. Prof. Dato' Dr. T. MARIMUTHU, MP	Vice President, AFPPD Malaysia
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	Ms. Maliwan NGENMUNE, MP	Vice Chairwoman, Senate Committee on Public Health
Vietnam	Mr. Le Quoc KHANH, MP	Vice Chairperson, Vietnam Association Parliamentarians on Population and Development (VAPPD)
	Mr. Tran Van THANH, MP	Member, VAPPD
	Dr. Nguyen Van TIEN	Executive Director, VAPPD
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	Mr. Alisher ABDIMOMUNOV, MP	Member of Parliament, Legislative Assembly, Parliament of Kyrgyzstan
Philippines	Mr. Jaime De Los Santos JACOB, MP	Member, Philippine Legislators' Committee on Population and Development, Inc.(PLCPD)
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	Mr. Hap Oma ALY	Assistant, CAPPD
Indonesia	Mr. Surya Chandra SURAPATY, MP	Vice Chairperson, Population and Health Committee
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	Mr. Keshab Prasad PUDASAINI	Committee Secretary, Population and Social Committee
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	Mr. Kwang-Ho SONG, MP	Member, CPE
	Mr. U-Wha CHUNG, MP	Member, CPE
	Ms. Regina LEE	General Director, CPE
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Sri Lanka	Mr. U.L.M. MOHIDEEN, MP	Member of Parliament, Parliament of Sri Lanka
	Dr. Y.D.N. JAYATHILAKA	Additional Secretary, Ministry of Health
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IPPF	Dr. Raj KARIM	Regional Director, East & South East Asia and Oceania Region, International Planned Parenthood Federation (IPPF)
NZFPA	Dr. Gillian GREER	Executive Director, New Zealand Family Planning Association (NZFPA)

NZFPA	Mr. Chris TE'O	Project Officer, Family Planning Association International Development (FPAID)
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Miyazaki Municipal University	Dr. Zembei UCHIJIMA	President, Miyazaki Municipal University
Secretariat of The Pacific Community	Dr. Chris McMURRAY	Demographer, Secretariat of the Pacific Community
Waikato University	Dr. Ian POOL	Director of Population Studies, Waikato University

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