



# “Water Voice”



## “Water Voice” Project Report

March 2003

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## “Water Voice” Project Report

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The Secretariat of the 3rd World Water Forum

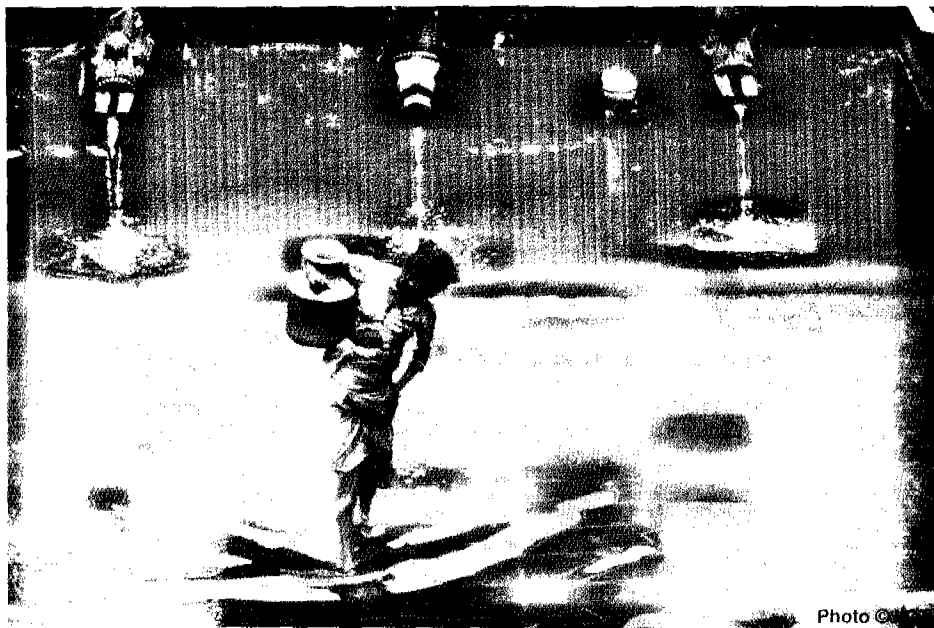


Photo ©

The Government says we must pay for water. How can anyone ask us to pay for a God-given gift?  
(South Africa, India etc.)

*OTC*



Photo ©M.Shira

The water problem in this village will not end if the villagers will not change their behavior. The Project program told them to make some contributions, start committees and open a water account so that a deep well can be constructed. (Tanzania)



Photo ©J.Karolyi

I am convinced the numbers of fish are decreasing...

(Poland)





Photo ©JICA

We are responsible for the next generations...

(China)



Photo © J. Karolyi

I found our life is quite vulnerable to flood...

(Hungary)



Water is our common goods which people has right to enjoy...

Photo ©JICA  
(Myanmar)





## “Acknowledgments”

“Water is everybody’s business.”

Therefore, the 3rd World Water Forum, the biggest international conference on water, should be an open platform accessible to all people concerned with water rather than meetings reserved for decision-makers, scholars, and professionals.

For this reason, the “Virtual Water Forum” and the related “Water Voice” project were planned in the process towards the 3rd World Water Forum. A considerable number of people concerned with water from all over the world participated and cooperated to create an important input for the Forum during last 20 months. We would like to express our sincere gratitude to all the people involved in the projects.

First of all, about 170 sessions in the “Virtual Water Forum” have been created in the Forum Web site, where about 5,500 participants have exchanged their views and discussed various aspects of water issues. I am convinced that the outcome of the “Virtual Water Forum” will be effectively followed up during the real sessions in the 3rd World Water Forum in Kyoto, Shiga and Osaka.

To collect voices from ordinary people, especially those living in remote areas without adequate means of communication, and to reflect these voices in the Forum, “Water Voice” Messengers were recruited from all over the world. The number of “Water Voice” Messengers reached 2,045 and 168 organizations participated in this project as “Water Voice” Partners. Nearly 27,000 “Water Voice” have been collected from 142 countries through the tireless efforts of these “Water Voice” Messengers.

The voices collected by the cooperation of the “Water Voice” Messenger have been classified based upon themes and regions in the Forum and can be browsed at the “Water Voice” database. Moreover, the Secretariat has provided the conveners of the Forum sessions with the “Water Voice” data file classified by themes and indicated by five different flags that serve as a valuable resource for their discussions. In addition, “Water Voice” have been utilized to indicate the current state of water issues for the “World Water Action Report” which will be an important output of the 3rd World Water Forum.

I firmly believe that the “Water Voice”, the collection of forthright views and needs of people around the world on water, will be reflected in the discussions of the sessions in various ways in the Forum. The 27,000 “Water Voice” are not just precious information, but they are also a valuable database generated by the efforts and cooperation of many people. It is my pleasure to introduce a part of the outcome of the “Water Voice” Project, the “Water Voice” Project Report.

According to the nature of this project, statistical analysis is not the main focus. However, we are pleased if this report will successfully convey the reality and diversity of the water issues through the actual “Voices” of the people throughout the world.

In closing, once again, I would like to express my sincere gratitude to all the participants of the “Water Voice” project; the voice senders, Messengers, related organizations, and all the others who have helped us collect and report this important information to the world.

**Hideaki Oda**

Secretary General

Secretariat of the 3rd World Water Forum

March 2003

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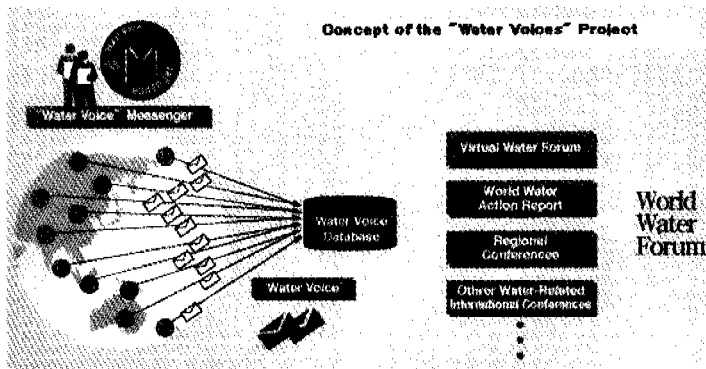
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## Introduction

Water problems that are now present in various parts of the world are becoming serious enough to threaten the continued existence of the human species and planet earth in the future. At this dawn of the 21<sup>st</sup> Century, people of various positions from all over the world will meet together to hold the 3<sup>rd</sup> World Water Forum in Kyoto, Osaka and Shiga Prefectures, which share the basin of the Yodo River that originates in Lake Biwa, from March 16 to 23, 2003 to find solutions to the water issues in view of the future and carry them out so that such issues will not be passed onto the next generation.

As the “Water Voice” project, which is one of the major programs of the 3<sup>rd</sup> World Water Forum, information on the actual situations and felt wants concerning water at the grassroots level in many parts of the world (“Water Voice”) will be collected by the volunteer “Water Voice” messengers by the start of the 3<sup>rd</sup> World Water Forum, which will be made into a database.



Discussions regarding water issues of the world have been held so far mainly by international organizations such as the U.N. and experts on water but participation of all people concerned are considered necessary for solving the issues.

To address this need, the World Water Forum is held once every three years for the purpose of finding new solutions through discussions with the attendance of people from various fields and areas including experts on water, decision makers, NGOs and other stakeholders. In reality, however, discussions at the Forum alone are not enough to incorporate the opinions of people of all over the world.

Accordingly, for the 3<sup>rd</sup> World Water Forum, efforts have been made to allow participation of as many people as possible through the use of the Internet and liaisons with different international organizations and NGOs.

However, it can be hardly said that the voices of the world are heard in the true sense without listening to those who live in secluded places, do not have access to the Internet, cannot express opinions because of the barrier of languages used at international conferences, etc.

This points to the importance of collection by "Water Voice" messengers of such voices that have not been easily conveyed in the past for understanding the actual water problems and take them up in the discussions towards the solutions.

As of January 31, 2003, the number of Water Voice from around the world is over 21,000, which let a variety of messages be heard regarding water problems.

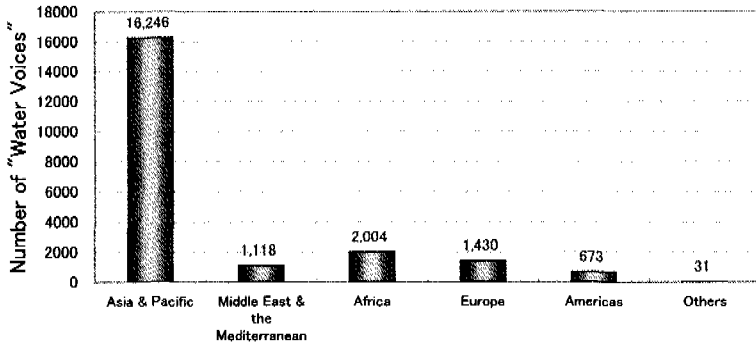
This report has been compiled with the intention of helping the readers develop deeper understanding of the present water problems in remote places and poverty groups and raising awareness for the purpose of solving water issues through "Water Voice" collected so far, which make known the actual situations concerning water and pressing needs at the grassroots level.

# 1. Finding of the “Water Voice” Project



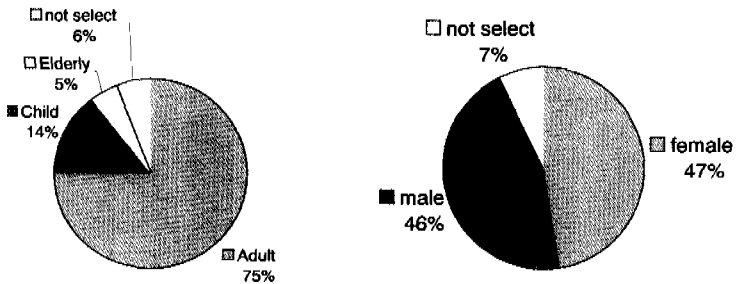
## 1. Finding of the “Water Voice” Project

As of January 31, 2003, the total number of countries that sent in “Water Voice” amounted to 142 and the number of “Water Voice” passed the 21,000 mark.

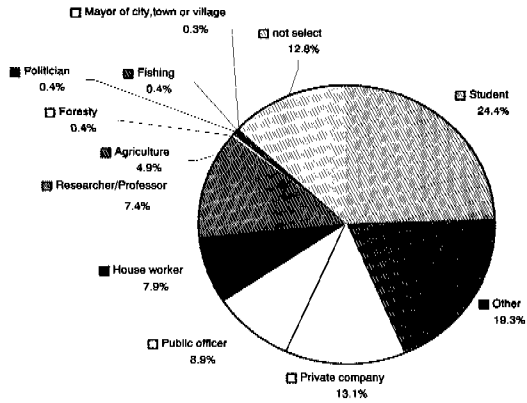


The breakdown of the regions that have sent the “Water Voice” is topped by Asia and the Pacific (especially Asia), followed by Africa, Europe, and the Middle East and Mediterranean. Among voices from Asian countries, over 10,000 have come from Japan.

By age bracket of the people who sent in “Water Voice,” adults accounted for most of the voices. Voices from women slightly outnumber voices from men.

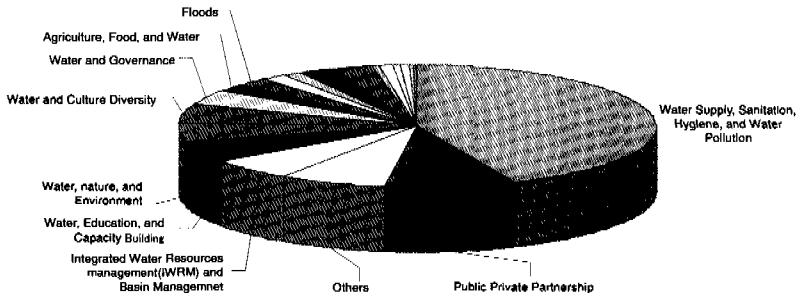






By occupation, the Student category accounted for the largest percentage of the people who sent in “Water Voice,” followed by Other, Private Company, and Public Officer categories and so on.

Classification by the major 31 themes of the 3<sup>rd</sup> World Water Forum shows that many of the voices concern water supply, sanitation, hygiene and water pollution, public private partnerships, problems involving more than one category, integrated resources management and education and capacity building.

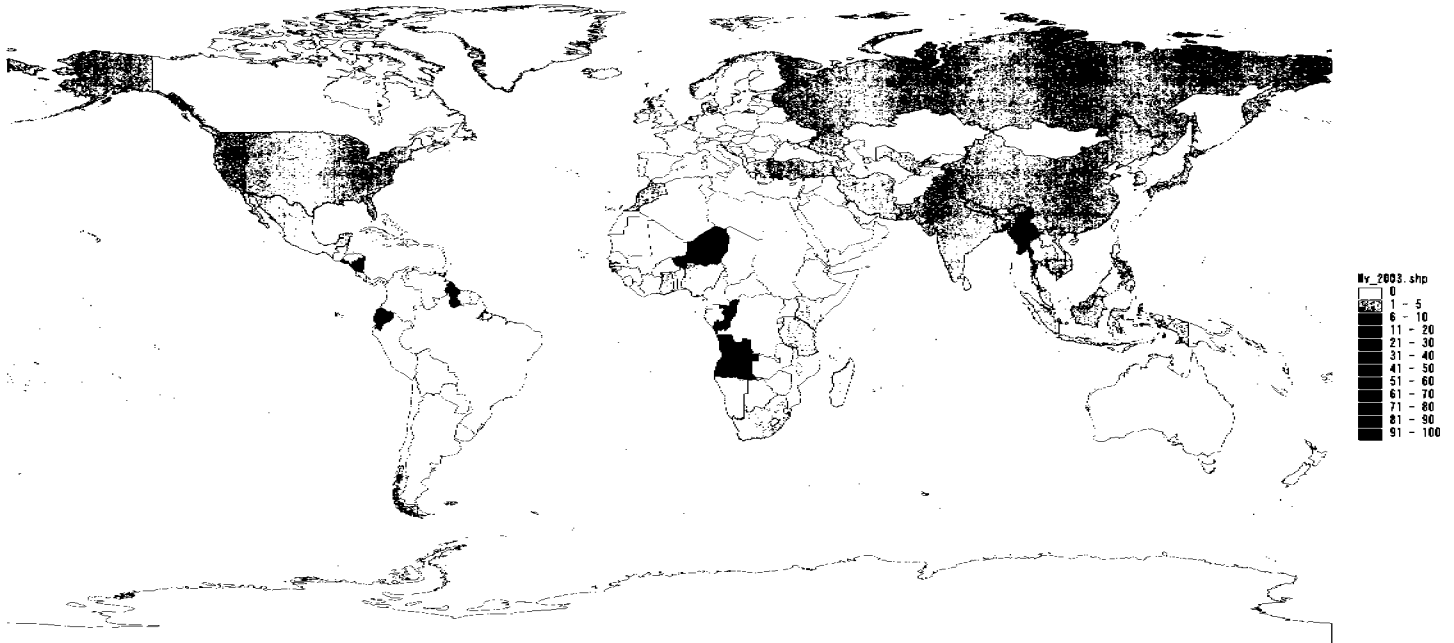


Based on these valuable “Water Voice,” this report has sorted out the current level of recognition of water issues and measures for solutions according to the major themes and areas.

## 2. “Water Voice”

### 2.1 Water and Poverty

## Water & Poverty



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Angola and Guyana are indicated in the darkest red.

## 2.1 Water and Poverty

### 2.1.1 Water and Poverty in the World

Eighty percent of the diseases in impoverished developing countries are due to dirty water, which is said to cause the death of ten million people every year. Since poor people live in slums, which do not have running water, they pay more than ten times as much as wealthy people do to get water. Those who have no choice but to live in low land areas because of poverty are exposed to the danger of losing their assets and lives every time flooding occurs.

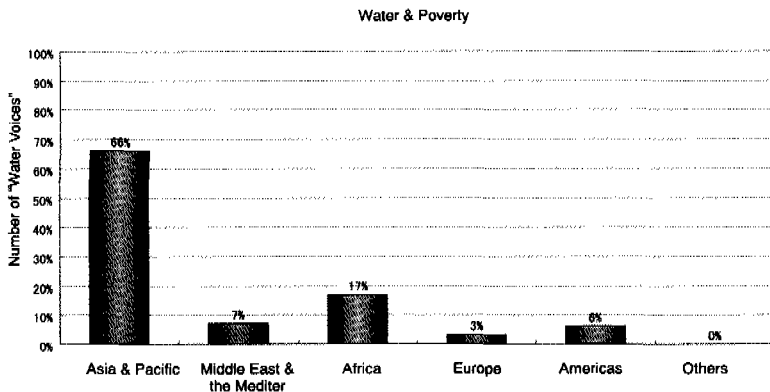
To sever this adverse link between water and poverty, getting to the bottom of how water and poverty are connected as well as providing financial assistance are necessary as the first step towards the solution of the problem.

This section presents “Water Voice” about water and poverty from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of water and poverty.

### 2.1.2 Water Voice Concerning Water and Poverty from Around the World

#### 1) Characteristics of Water Voice Concerning Water and Poverty

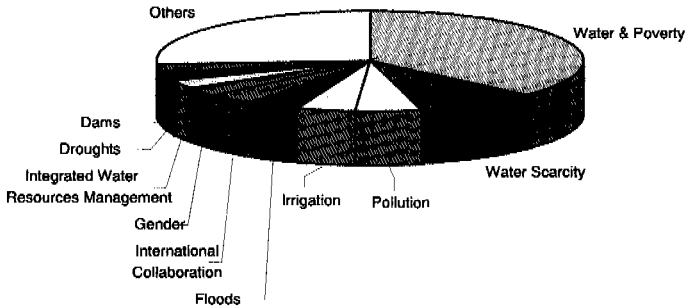
The “Water Voice” concerning water and poverty from throughout the world amounted to 246 as of the end of January 2003. Classification of them by region shows that most voices (about 70 percent of all) came from Asia and Pacific (especially Asia), followed by Africa and America (especially South America). Most voices came from Asian-Pacific countries, of which Japan accounts for about 40 percent.



Voices of adults top the classification by age with about 70 percent, followed by voices of children, while classification by gender shows that voices from men are slightly greater in number than those from women.



Classification by subcategories (47 categories <sup>1)</sup>) specified by the contributors of “Water Voice” concerning water and poverty shows that, in addition to given keywords relevant to water and poverty, water scarcity, water pollution, irrigation, international collaboration, gender, integrated water resources management, etc. are associated with water and poverty.



## 2) Listening to “Water Voice” Concerning Water and Poverty

The major part of “Water Voice” concerning water and poverty from around the world are from Asia, Africa and America (especially South America), which are believed to have more than one billion people living in poverty.

Water problems are closely related to every aspect of the lives of people in these areas, including the rate of infection of disease, etc. Those people have limited access to various services and information, are socially or financially subordinate to the upper strata, and have no security when faced with unstable situations.

Classification according to the water and poverty keywords mentioned above and the characterization of the actual “Water Voice” show that the links between “water” and “poverty” include the following problems.

- Poor people do not have access to sufficient clean water..
- Poor people have no choice but to live in nonproductive land unsuitable for irrigation agriculture.
- Water policies are dominated by rich people and hardly benefit the poor (poor people obtain water at prices higher than those of tap water).
- Women shoulder the burden of most of the unpaid care labor (fetching water, cooking, etc.) and are especially disadvantaged among the poor.

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Poor people without access to sufficient clean water

There exists an unprecedented (large) number of starving people at present, which is still increasing. The number of people living in slums is also on the rise. The increase in people who do not have access to clean water or public health contributes to diseases caused by inadequate public hygiene. Although there has been remarkable improvement, the tendency still shows continued poverty and an increasing number of poor people.

I live in an urban area, but while going to the office everyday, I pass near a slum where the poor people live. The children of the dwellers are always dirty and there are heaps of garbage nearby. One day, I asked one of the residents about this. He explained that it is due to a scarcity of water. The slum has no water supply and no sanitation facility. Therefore, there is no proper solid waste management system. The people do not wash everyday because of the non-availability of water. For drinking purposes, the women of the area carry water from nearby water source in pots. This slum is also facing many health problems due to the non-availability of water. The main reason for the absence of a proper water supply system is that this ghetto (slum) was established without any proper planning. Therefore, now, the city authorities find it difficult to provide water to the area.

~Adult male of Pakistan (Voice ID: 14075)

In the urban surroundings of a poor developing country, plenty of clean water from the household tap is a great luxury. For some of us poorer urban residents, public fountains are the only access to clean water -- water for drinking, water for washing, water for laundry. The public fountain is as important as the weekly market or the Sunday church service to our parents, a meeting place to talk about life, death and politics to our grandparents or to play hide-and-seek on the lookout for a bride or bridegroom to our older brothers and sisters. Water for the household must be collected in buckets, carried home and used very, very sparingly.

~Boy of Madagascar (Voice ID: 24796)

## (2) Poor people living in nonproductive land or area susceptible to disasters

The world is faced with the destruction of the global environment due to the continued spread of poverty. Many countries depend on agricultural exports to support their lives. However, the expansion of agriculture often stresses the environment. Wealthy landowners go on cultivating land for growing cash crops, which drives farmers away to infertile land. Farmers who are forced to move to nonproductive land due to population increase or inappropriate land distribution try to expand farmland by cutting down forest trees or cultivating hillsides. These actions cause soil runoff, which leads to drought and flooding. People who suffer most from such natural disasters are always the poor.

The Kheda district, where we live, used to have a lot of water but the five rivers here have almost dried up during the last three or four years, and the water has become salty and muddy. As a result, many villages face drinking water problems. Vegetables do not grow well and the growers' debts are increasing.

~Adult female of India (Voice ID: 8877)

In the last few years, Africa, India and Latin America as well as all of Asia have suffered from successive natural disasters such as floods. Poor people living in hilly districts with vulnerable ecosystems or on unprotected coasts are extremely exposed to such natural disasters.

Nanavaga and Arjanpur (villages) have three small rivers. After every heavy rain, the rivers rise and cut off both these villages from the outside world. After floodwaters recede, there is always a threat of water-borne diseases. During the floods, there is no work so people make less income. Most of the houses are severely damaged by floodwaters and need to be repaired every two or three years. People in the village are poor and do not have enough money to repair their houses. The irony is that when there are no floods, water is scarce.

~Adult female of India (Voice ID: 8875)

A long time ago, my family lived in Baray Kaeut (village) and our livelihood depended on rice production. In those days, we did not have any problems related to water. In the last few years, we are suffering from annual flooding of the Mekong River that damages our rainfed rice. Now, we can cultivate rice only in the dry season. This problem forces many villagers to abandon their homeland to find some sort of income in the cities to support their families. After my children left, I am looking after my two grandchildren. I always have difficulty to collect water from the open well for daily use because I am very old and do not have enough power to carry water from the deep well (the water table is about 10 m in the dry season and about 3 m in wet season).

~Elderly female of Cambodia (Voice ID: 8875)

### (3) Poor people not benefiting from water-related services

Policies dealing with water-related assistance or water as social goods are generating the contradiction of the poorest people suffering the most. Too often rich people dominate water-related assistance, leaving insufficient resources to operate and expand other services. As a result, quota systems are implemented and the poor are always sent to the end of the line.

Water is not readily available in this area at all. The little that we get is very expensive. Though we manage to buy it, it is never sufficient, as we are unable to buy enough. I would be glad to see water available every day and in abundance.

~Adult female of Ghana (Voice ID: 2685)

Water-related services, including water supply for irrigation and domestic use, industrial waterworks and sewage treatment, are generously aided by most governments. While this is done for legitimate reasons (provision of water, food and employment), it brings about undesirable effects. The users do not recognize the value of water and consume it wastefully. Most of the assistance does not reach the poor and is dominated by the rich.

The water debate still revolves around the question of whether water is a right or a commodity. If it's water for basic needs, it is a right. If it is water for comfort, for luxury, you have to pay.

~Adult male of Bangladesh (Voice ID: 3613)

In many cities of developing countries, nearly all areas without running water depend on water sellers who provide water with trucks, etc. The water quality is unreliable and the prices are usually higher than tap water. The marketing of expensive water for low-income people shows that a public water supply model based on assistance and lacking in accountability is a failure or, in the very least, little effective.



Until I was about 12 years old, water in the community was piped in. The water went off for reasons I still do not know. The community now depends on water conveyed by water tankers. Individuals have constructed reservoirs in which the conveyed water is stored to sell it later at higher prices. The lack of money makes it hard for some of us to have a daily supply of water.

~Adult male of Ghana (Voice ID: 8485)

#### (4) Women in especially unfair positions among the poor

Poor people are disadvantaged in benefiting from the improvement of waterworks. Poor women are especially in unfair situations. In many societies, women are assigned to fetching and impounding water, taking care of children and sick people, cooking, cleaning and hygiene by the gender division of labor. In many regions, women are responsible for the heavy task of fetching water by walking long distances in rough terrain, often assisted by their daughters. Women also take charge of looking after sick people, many of whom are children suffering from diseases directly caused by polluted water.

Because of our water problems, we cannot do any kind of work as we spend all our time on searching for and fetching water. We have to leave our children home alone. We cannot give them proper food and they are not able to go to school.

~Adult female of India (Voice ID: 9817)

Development of water supply and sewerage systems at a certain level is expected to greatly improve the quality of lives of poor women and their families.

Everyday, women spend two hours fetching water and three hours on other domestic work. Having to spend a lot of time on fetching water causes women from poor families to suffer in many ways: economically, physically, and mentally. If water were readily available, life would be much easier on these women.

~Adult male of India (Voice ID: 10083)

### 3) Observations

Water is a fundamental human need, which is indispensable for life and health. Many of the poorest people in the world do not even fill this need. About 1.2 billion people -- or one in every five people -- are not provided with sufficient and safe water, and about half of the world population does not have adequate sanitation. Three to four million people die every year directly due to diseases transmitted by water, which include over two million children. In addition, countless people are suffering from diseases that seriously inconvenience their lives. Sanitation of very low quality may cause problems of parasites, etc., which greatly affects nourishment. As urbanization continues in the world and the number of poor people living in super-cities of developing countries who are not given adequate services increases, the nature of these problems are changing.

To address the pressing “Water Voice” concerning water and poverty collected from around the world, the following measures are considered necessary.

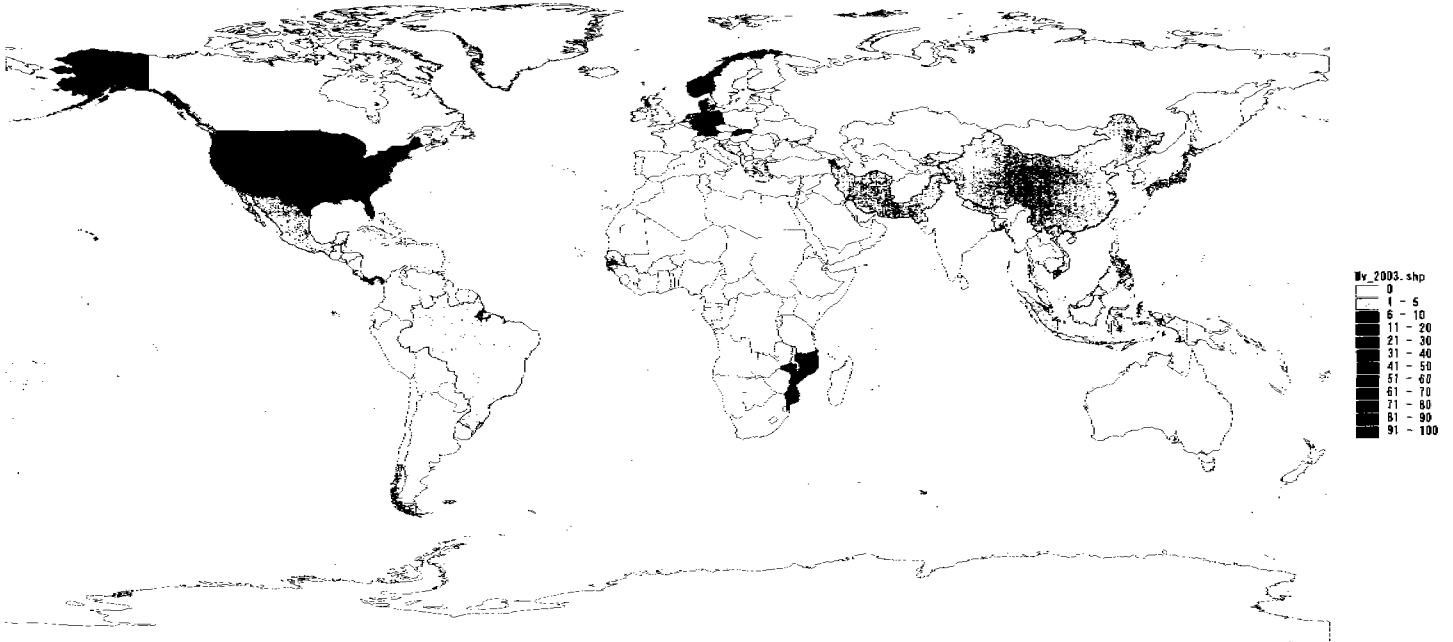
- Secure and sustainable provision of good quality water is required. The water sources should be sought locally as much as possible. When supply from outside is necessary, the community should take charge of its management.
- It is important to provide local residents (especially poor people) with the means for securing food provisions, improving water productivity, helping satisfy the growing food demand of cities, as well as for governments to appropriately manage water so as to minimize the damage of floods and droughts.
- It is indispensable to provide integrated services and involve communities. This is especially important in expanding cities, when conventional water supply and sewerage systems cannot keep up with the growth of demand or when financial mechanisms to cover the service costs are underdeveloped.
- As health and sanitation administrators and water providers, women play very important roles in all parts of the world. Regarding the activities in this field, authority should be given mainly to women.



## **2.2 Water for Peace**

**(Dispute Settlement through Water)**

# Water for Peace



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Denmark, Slovak, Armenia and Mozambique are indicated in the darkest red.

## 2.2 Water for Peace

### 2.2.1 Water and Peace in the World

In this century, water will become a flash point of conflict. There are 261 international rivers in the world, which means that rivers cross borders and their water resources are shared. Examples of conflicts related to international water resources are too many to mention. However, it can be pointed out that, in areas where the national systems are stable or even regional integration is promoted such as in Western Europe and North and South America, international rivers tend not to cause international conflicts and, if anything, promote international cooperation. In areas where the foundations of nation-states themselves are weak such as Central Asia and Africa, however, they may bring about civil wars.

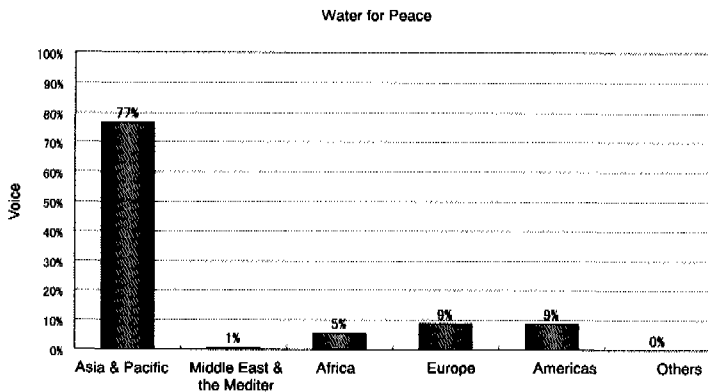
This section presents “Water Voice” about water for peace from throughout the world, which will deepen understanding of the actual situations and pressing needs concerning water issues for solving this and related problems.

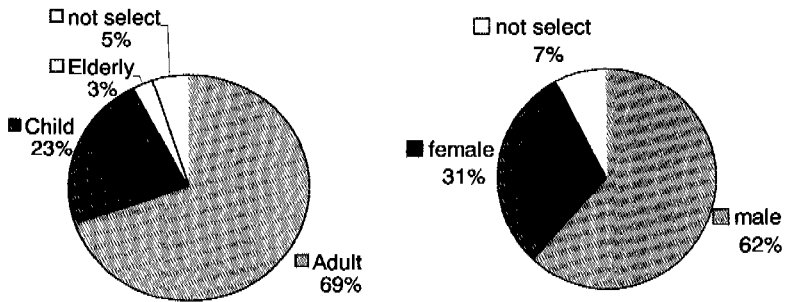
### 2.2.2 Water Voice Concerning Water for Peace from Around the World

#### 1) Characteristics of Water Voice Concerning Water for Peace

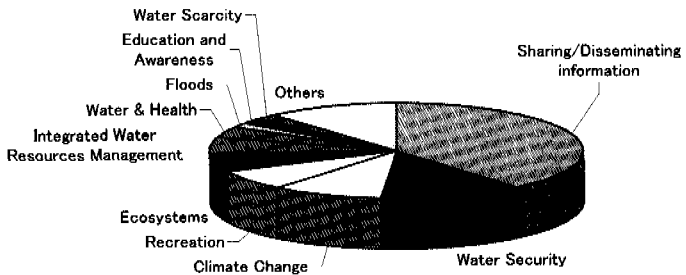
The “Water Voice” concerning water for peace from throughout the world added up to 149 as of the end of January 2003. Classification of them by region shows that most voices (nearly 80 percent of the whole) came from Asia and the Pacific (especially Asia), followed by America, Africa and Europe. Among Asian Pacific countries, from which most voices came, Japan has a majority.

Voices from adults top the classification by age with about 75 percent, followed by voices of children, while classification by gender shows that voices from men account for 60 percent.





Classification by subcategories (47 categories <sup>1)</sup>) specified by the contributors of “Water Voice” concerning water for peace shows that sharing/disseminating information on water, water security, climate change, etc. are associated with water for peace.



## 2) Listening to “Water Voice” Concerning Water for Peace

Classification by the water for peace keywords mentioned above and the characterization of the actual “Water Voice” show that the links between “water” and “peace” involve the following problems.

- The volume of river water is not enough to satisfy all expected demands.
- Water is consumed or distributed apparently unfairly among countries in a basin.
- There is no clear agreement on water resource distribution involving all countries in a basin.

Regarding the problems above, the actual “Water Voice” is presented below for further understanding of the current situation of water problems around the world.

### (1) Disputes over water due to decrease in water supply

As the supply of clean water decreases, disputes over water are becoming more and more serious. Such disputes often occur especially between expanding urban areas and rural areas. Distributing scarce water as reasonably as possible is important for the socio-economic development of countries without abundant water resources. However, some friction between stakeholders is unavoidable in the course of distribution.

In India, recently, we are having a water problem in our region KARNATAKA STATE with the neighboring state of TAMIL NADU (both are southern states in India). In KARNATAKA, we have a river called Cauvery. This river's water is insufficient even for the needs of our region, KARNATAKA, alone. At the same time, TAMIL NADU is faced with a water problem, too. And, the central government ordered the government of KARNATAKA STATE to release 15 TMC of water/day for TAMIL NADU. Farmers of KARNATAKA STATE are against this central government's decision, and are protesting. This is a big issue now in India.

~Adult male of India (Voice ID: 13671)

### (2) Unfair consumption or distribution between countries in a basin

Such conflicts between two or more countries are more often caused by insufficient political, technical or social measures or unfair distribution of wealth and information than by problems related to water itself such as demands of upstream and downstream consumers or other people or demands for water for irrigation, hydraulic power generation, flood control and water transport.



Armenia, my homeland, has difficult relations with neighboring Azerbaijan. The military conflict dates back to the early 1990s, after the collapse of the former USSR. A cease-fire came in 1994. There are still a lot of issues between the two countries, mostly related to the territories once belonging to Azerbaijan, but currently controlled by Armenians. The region is mostly arid and agriculture depends on irrigation. Both sides suffer from inadequate management of transboundary waters, with Azerbaijan, being located downstream, experiencing more water demand. At the same time, the Azeri Government rejects any kind of political or technical level dialog with Armenia as long as territorial issues stay unresolved. The mutual accusations on the quality and quantity of water are heard on a daily basis, but practical steps are not being taken to build cooperation. The water quality/quantity monitoring system in both countries is outdated and mostly not functioning, causing a lack of available data and a real concern for local populations.

~Adult male of Armenia (Voice ID: 2917)

### (3) Lack of a clear agreement on water resource distribution between countries concerned

If the foundations of nation-states themselves are weak as seen in Central Asia and Africa, civil wars may break out, which sometimes lead to regional conflicts. Or, if nation-states are immature and apt to turn to nationalism as in Asia and the Near East, they often have tense relations with neighboring countries.

A lack of international agreements between two or more countries or nongovernmental organizations as well as a lack of communication between foreign aid agencies and governmental and nongovernmental organizations that provide coordination and facilities concerning water resources are also major contributors to conflicts over water.

There is no rationale for the use of Lake Victoria Water. Government should look into the equal distribution of the lake water especially for irrigation, let alone domestic supply.

~Tanzania (Voice ID: 10359)

Even if there are arrangements, they are sometimes unobserved because of inadequate cooperation.

Salinity is seriously increasing in the coastal parts of Bangladesh. Upstream, water flows from Nepal through Indian territory. In spite of the agreed water treaty, the area runs out of water as it is controlled by India. As a result, mangrove biodiversity, human beings and livestock are threatened. All the party-nations should respect the international water treaty.

~Adult male of Bangladesh (Voice ID: 1439)

### 3) Observations

As stated above, circumstances that are most likely to cause conflicts over water resources arise when river water is not enough to fill the demands, consumption or distribution of water between countries in a basin is unfair and clear agreements on water resource distribution do not exist. Currently, these three circumstances are present in a countless number of areas.

Politics driven by water shortage are coming into being, which is definitely posing a threat to the security of nations and the stability of civilized society. However, disputes over water are not destined to occur inevitably. Sharing of water resources should be a reason for cooperation of neighboring countries rather than for battles. Fomenting an understanding of international rivers amongst countries through water resource issues is bringing about solutions in a considerable number of areas. Wise administration of water in basin areas will form the basis on which peace of the 21<sup>st</sup> Century is built.

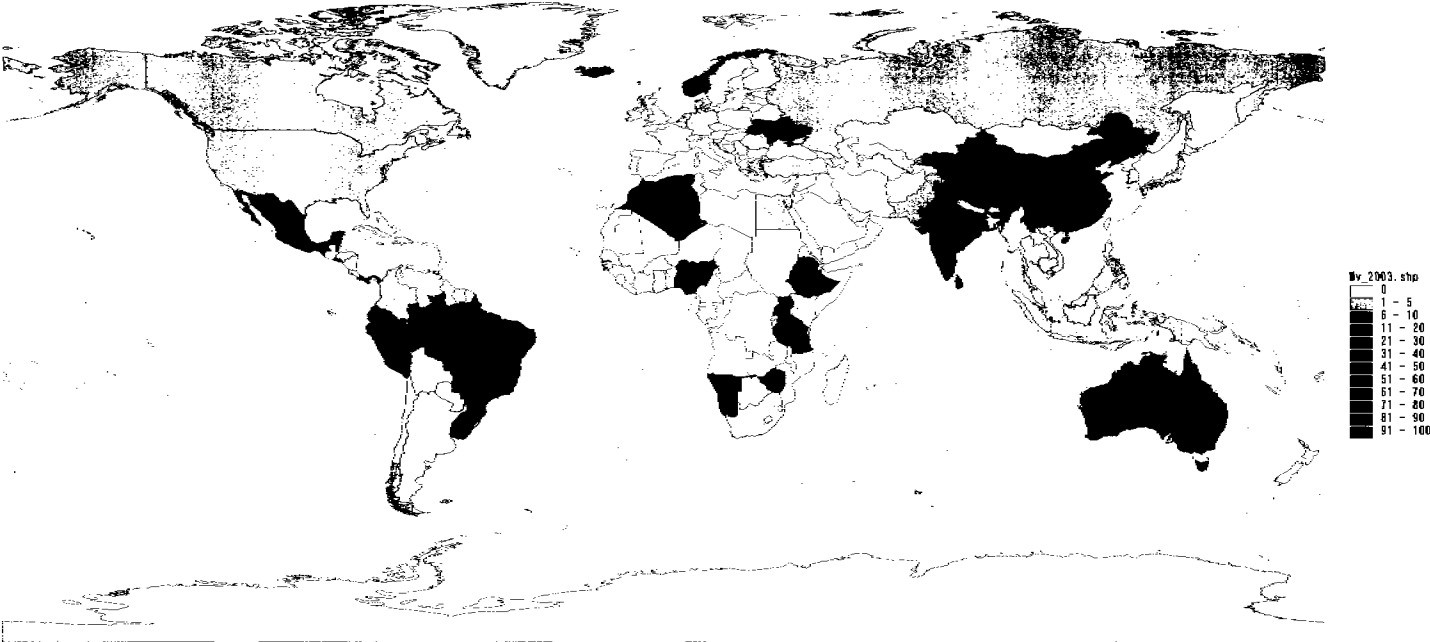
To address the pressing “Water Voice” concerning water for Peace collected from around the world, the following measures are considered necessary.

- Regarding domestic problems, assistance and further progress in water-related legislation and institutional structures are important for the coordinated administration of water and the cooperative management and sustainable development of water resources. In addition, adoption of a decision-making approach with the participation of authorities, business organizations, stakeholders, farmers and women will be an important strategy for improving awareness of problems.
- It is meaningful to assist the further development of legal principles and institutional structures for the coordination of water administration in transboundary areas and the promotion of cooperation of countries along rivers.
- The coordination and harmonization of interests amongst countries along rivers, management of water quality and quantity, information exchange and enforcement of agreements of international watershed organizations are essential.



## **2.3 Water and Governance (Effective Water Governance)**

# Water and Governance



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Norway, Ukraine, Uruguay and Peru are indicated in the darkest red.

## 2.3 Water and Governance (Effective Water Governance)

### 2.3.1 Water and Governance (Effective Water Governance) Around the World

Based on the understanding that a water management crisis is caused by closed decision-making processes and ineffective water administration, the 2<sup>nd</sup> World Water Forum raised Effective Water Governance as an important issue. Dialogs concerning effective water governance that started as a consequence of problems have provided opportunities to discuss water-related decision-making processes and systems of water governance by way of talks between decision-makers and water consumers and present good examples and lessons regarding the implementation of integrated water resource management in many countries.

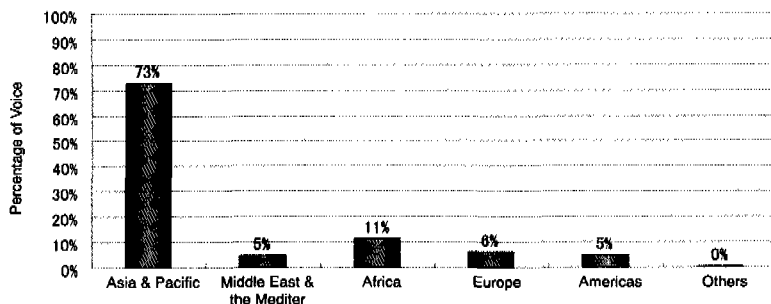
It is important to clarify the problems including inefficiency (adverse effect of bureaucratic sectionalism) and corruption as well as to consider improvement through a study of existing legal and administrative systems so as to eliminate factors that impede effective water governance.

This section presents “Water Voice” about water and governance from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving this and related problems.

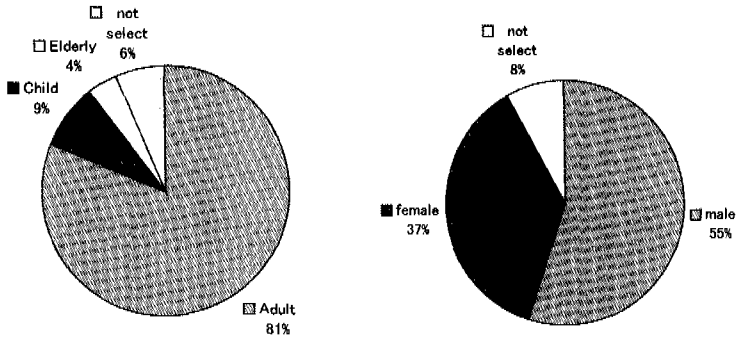
### 2.3.2 Water Voice Concerning Water and Governance from Around the World

#### 1) Characteristics of Water Voice Concerning Water and Governance

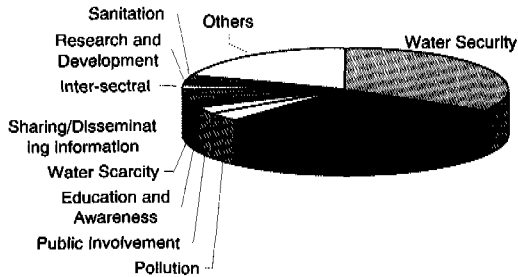
The “Water Voice” concerning water and governance from throughout the world amounted to 862 as of the end of January 2003. Classification of them by region shows that most voices came from Asia and the Pacific (especially Asia), followed by Africa and Europe. Of the voices from Asian Pacific countries, from which most voices came, 50 percent are from Japan.



When classified by age, 80 percent of the voices come from adults followed by children. Classification by gender shows that voices from men account for more than half of the whole.



Classification by subcategories (47 categories <sup>1)</sup>) specified by the contributors of “Water Voice” concerning water and governance shows that water security, water policies, water pollution, public involvement, etc. are associated with water and governance.



## 2) Listening to “Water Voice” Concerning Water and Governance

The theme “governing water wisely” means good governance of water resources that allows ordinary citizens and stakeholders to participate in the management of water resources.

Classification according to the water and governance keywords mentioned above and the characterization of the actual “Water Voice” show that the links between “water” and “governance” include the following issues.

- Since the responsibilities for the management or control of water resources are distributed among a number of organizations, coordination between departments is important.
- Many of the people, especially poor people, who depend on water resources and communities that are left behind social development do not have legitimate rights or real power to manage water.

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Lack of appropriate water administration systems

The biggest water resource management issues concern institutional systems. Social structure, governmental policies, choice of technologies and individual consumption all bear influence. However, political corruption, fragmented systems, redundant efforts, wrong distribution of resources and authoritarian centralism have made effective water governance difficult up to now.

Water in many areas of this country is a major problem. Many places are not supplied with clean and safe water because of old water sources and distribution systems, and poor management by water authorities. I ask the government to keep their eyes on the issue of water, as this is a very important item for our lives.

~Adult female of Tanzania (Voice ID: 14159)

Compared with other countries, Tanzania can be said to be rather privileged in so far as the availability of water. There are numerous rivers and lakes in the country, but the sad part is that this potential is not fully utilized. In spite of the perceived abundance, many people continue to face a severe shortage of water.

Appropriate measures should be taken to distribute water that is so desperately needed by all the people. In this regard, communities and all the individuals have a duty to ensure that the little water that becomes available be used properly. On the other hand, the government should not shy away from its primary responsibility of ensuring that available water is distributed to all the people using funds generated from taxes which people pay.

~Adult male of Tanzania (Voice ID: 14218)



During the military era, water policy suffered from major neglect by the government. As a result of this, many companies became involved in water sales. But, many Nigerians especially those in the rural areas cannot afford to pay the cost of popular "pure water." This may be the reason why most people in the rural area of Uora (town) suffer from water-borne diseases. When people living in a rural area cannot afford to pay for clean water, they take any kind of water available. The government should assist the poor with supplying water for domestic use and drinking.

~Adult male of Nigeria (Voice ID: 14611)

My voice is not for me. This is for those who do not have access to potable water yet but cannot articulate their voice. Current efforts to popularize the "user pays" concept instead of indirect payment through taxes is being hampered by local politicians who look for personal interest (to gain popularity and win in an election). And, it maligns or undermines the water project prepared by his political opponent. This is why water projects seldom materialize. Water projects need to be liberated from the influence of politicians.

~Adult male of the Philippines (Voice ID: 16247)

## (2) Adverse effect of unclear water management

A real revolution in water resource management is not brought about until people concerned have gained the power to manage their own resources as much as possible. What politicians need to do is to destroy the idea that water is fundamentally a government project. They must promote processes with the participation of representatives so that water can be managed locally in line with the requirements of many stakeholders.

Water policy is not very clear with regards to water for irrigation. More stakeholders should be involved and not merely leave the exercise of reform to one ministry to undertake. It should be done without bias so that all users can be accorded the necessary priority especially irrigation.

~Adult male of Tanzania (Voice ID: 10331)

In our village there was a water problem as the borewell did not work for almost a year and women were forced to fetch water from a well in the field. The well was very deep and sometimes women fell in the well. So, we contacted the members of the village council and we met with the leader to discuss the problem. But, he was very rude and told us that was none of our concern. We pursued the matter to a higher level and found out the real cause of the problem: electricity connection. When it was repaired, the village got water.

~Adult female of India (Voice ID: 17169)

In the Peruvian mountains, the severe geographical conditions make water resources scarce. Due to water pollution from development in the mining industry, water use for agriculture is being restricted. Revisions to the water resource law are presently being discussed, and NGO-related staff, local residents, farmers, and university-related staff are participating in the decision-making process. Due to the theme encompassing diverse issues, it will be difficult to reach a consensus on the effective usage of water because of increased water demand and problems of water shortage from droughts.

Adult male of Peru (Voice ID: 3616)

### 3) Observations

If government agencies in charge of water effectively distribute and manage water resources according to reasonable policies and regulations and address the social and economic needs of the country and long-term sustainability of water resources of the country or area, good water resource governance will be provided.

To realize good water resource governance, it is necessary to create a good environment by encouraging and integrating private and public initiatives, and laying down rules to allow clear transactions between stakeholders based on trust and accountability, for all river and aquifer resources, as well as those that are not taken charge of at present although their management affects many people.

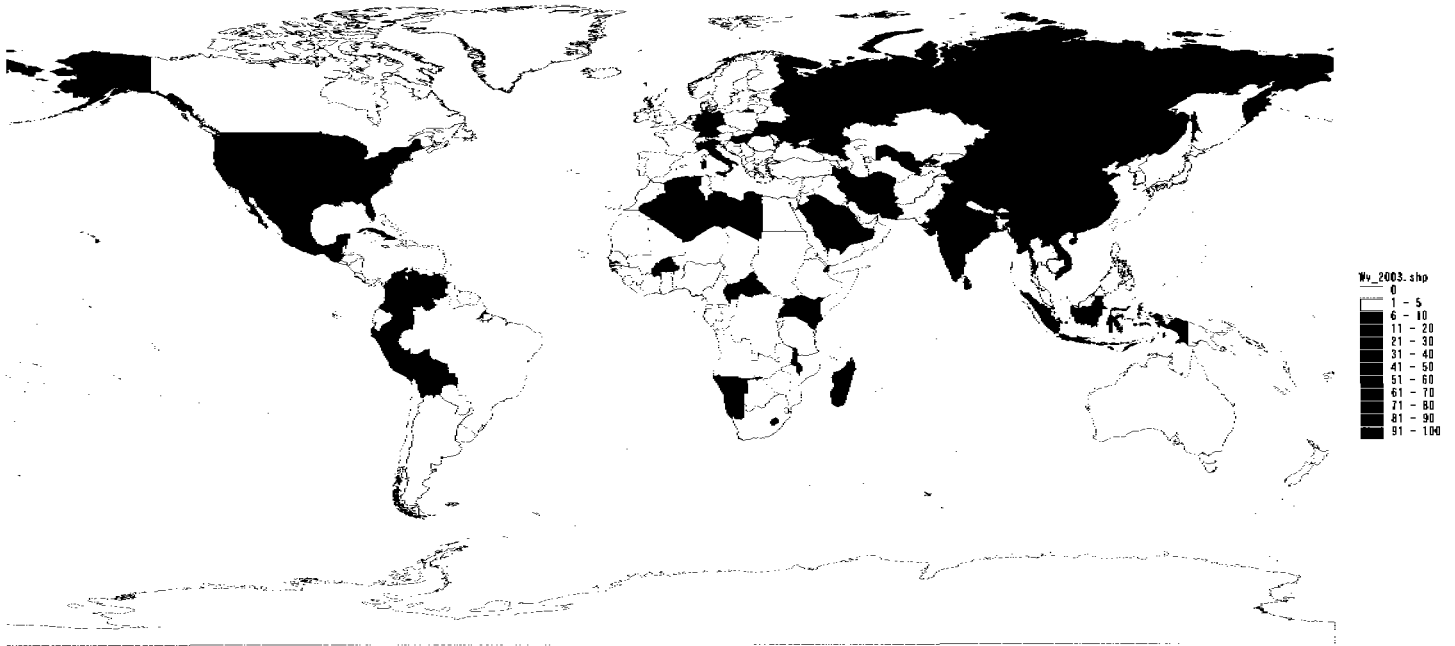
To address the pressing “Water Voice” concerning water and governance collected from around the world, the following measures are considered necessary.

- Development of systems. The basics include coordination between departments, regional dispersion and dealing with administrative rather than operational responsibilities by reform of the centralized and technology-oriented bureaucracy. This requires the involvement of local administrative bodies and the private sector.
- Expansion of participation. Community involvement should be increased and a broader range of civil groups invited to take part in important decision-making processes regarding water resource management and service development.



## **2.4 Integrated Water Resources Management (IWRM) and Basin Management**

# Integrated Water Resources Management (IWRM) and Basin Management



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Central Africa, Uzbekistan and Guatemala are indicated in the darkest red.

## 2.4 Integrated Water Resources Management (IWRM) and Basin Management

### 2.4.1 IWRM and Basin Management in the World

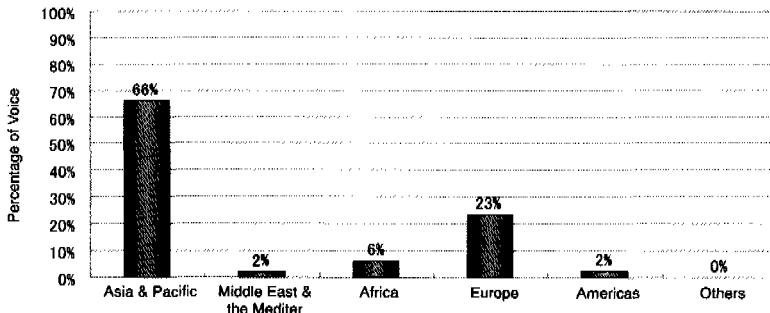
Recently in many countries, water problems inevitably arise in addressing issues such as eradication of poverty, economic development, environmental sustainability and political stability. To solve problems including water shortage, deterioration of water, floods and droughts, securing of food and water supply and sanitation, special consideration and prompt action are considered necessary. Through the conferences in Dublin and Rio de Janeiro in 1992, 2<sup>nd</sup> World Water Forum and Johannesburg Summit, integrated water resources management (IWRM) has been recognized as a concept that each country needs to address in terms of cost effectiveness, sustainability and fairness.

This section presents “Water Voice” from throughout the world about IWRM and Basin Management, which will facilitate understanding of the actual situations and pressing needs concerning water issues for solving the problem involved with IWRM and Basin Management.

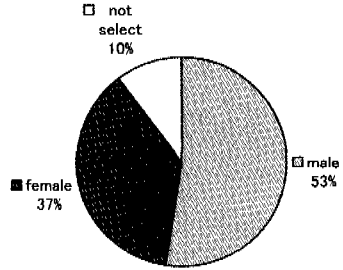
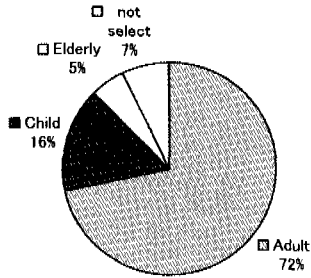
### 2.4.2 Water Voice of the World Concerning IWRM Basin Management

#### 1) Characteristics of Water Voice Concerning IWRM and Basin Management

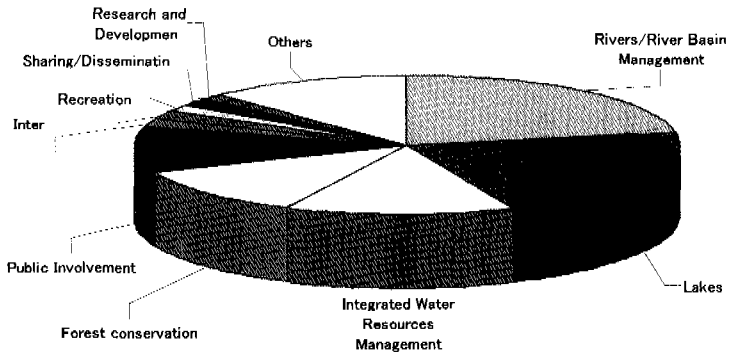
The “Water Voice” from throughout the world concerning IWRM and Basin Management have added up to 1,268 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Europe and Africa. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 70 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that half of all voices are of males.



Classification by subcategory (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning Integrated Water Resources Management and Basin Management shows that basin management, lakes, IWRM, forest conservation, public involvement, etc. are associated with Integrated Water Resources Management and Basin Management.



## 2) Listening to “Water Voice” Concerning IWRM and Basin Management

Water administration has developed for individual purposes of water usage according to local societies and climates. However, this led to sectionalized water usage and management systems, which has made it difficult to manage water effectively and harmoniously.

*Integrated Water Resources Management (IWRM)* is intended for abolishing sectionalism that hampers solution of water problems and creating a momentum and building systems for integrated coordination of environment, development, land and resources. Basin Management means creation of processes for addressing water problems for individual basin, which is the most basic unit of water administration, to solve the problems.

Classification according to the IWRM and Basin Management keywords mentioned above and the characterization of the actual “water voice” indicate that the “water” and “governance” involve the following problems:

- People concerned cannot participate in water administration.
- Quantitative knowledge on water resources is seriously lacking.
- Joint management among nations concerning international river basins does not materialize.

Regarding the problems above, the actual “water voice” is presented below for further understanding of the current situations of water problems of the world.

### ① Dominant water administration by water experts

In many cases, governments are managing most of water by efforts of individual departments and there is no coordination between planning and operation, close cooperation with environmental department is lacking and provinces that ignore natural riparian zoning of surface water and ground water are in charge of administration. To make matters worse, women and men in communities dependent on water administration for their lives and daily bread, who are the most important of the people concerned, do not participate in decision-making.

It is now certain that the government lacks the strength of character to provide safe water. Water pipes were buried all over the state a couple of years ago. Where is water flowing? Another avenue to misappropriate public funds! The channelization of Ogunpa is still pending twenty years after unfinished as usual. Our destiny is in our hands. If we cooperate, communities can provide water for themselves through boreholes, wells and reservoir.

~Adult male of Nigeria (Voice ID: 19405)

Social and economic decisions that have influence on the use of land and water require the participation of such people.



The chief of the Kadoma Rural District council of Zimbabwe entrusts village-heads with the protection and management of national resources of the respective areas. There is collective decision-making by the population of the villages. This policy is adopted in all areas and water management by village-heads has pervaded.

~Elderly male of Zimbabwe (Voice ID: 2512)

## (2) Lack of quantitative knowledge on water resources

The conferences held as part of the World Water Vision activities have shown that failure to assess the value of water and environment in the past caused serious lack of quantitative knowledge on fresh water ecosystems. Likewise, little incentive has been given to promote innovations in water saving technology.

Our country's water resources are not being effectively utilized in many regions. 90% of the water flows into the Atlantic Ocean while the remaining 10% flows into the Pacific Ocean. Since population is concentrated in the Pacific Ocean side, pressure towards water resources is high. There is a need for education and enlightenment to manage and effectively utilize our water resources.

~Adult male of Columbia (Voice ID: 3631)

Guatemala is blessed with rain, having an annual average rainfall of 2,500 mm balanced throughout 6 months. Due to no regulatory laws on water utilization, water pollution, loss of 75% of its surface water, ineffective irrigation, and water supply/misuse problems are occurring in the three main water basins where 30 rivers join.

~Adult male of Guatemala (Voice ID: 3621)

## (3) Lack of joint management among nations in international river basins

About half of the world population lives in river basins shared by more than one country. River basins not only provide for natural ecosystems but also are overwhelmingly important sources of fresh water. Since interactions between natural divisions in river basins (upstream and downstream, tributaries and mainstreams, land and water, ground water and surface water, etc.) are very close, cooperative management of shared river basins is widely desired.

Most of the rivers in Pakistan flow in from India. Before 1947, the Ravi, one of such rivers in the Punjab Province, was very famous for its fish and generosity of water. But since the political conflicts between Pakistan and India in 1947, water has been polluted and fish destroyed. Now most of the time it remains dry and some time when India opens the gates of its head works it destroys everything in the form of flood. All people living beside this river remains under the threat either of the dryness or flood of river.

~Adult male of Pakistan (Voice ID: 2203)

### 3) Observations

The biggest water resources management issues concern institutional systems. Social structure, governmental policies, choice of technologies and individual consumption all have influence. The real revolution in water resources management is not brought about until people concerned have gained the power to manage their own resources as much as possible. For that purpose, it is desired to introduce the concept of integrated water resources management including major activities: inviting the participation of all people concerned in integrated management, increasing public funds for research and technological innovation in fields that benefit the public, raising awareness of the necessity of cooperation concerning integrated water resources management in international river basins, giving a substantial boost to investment in water, etc.

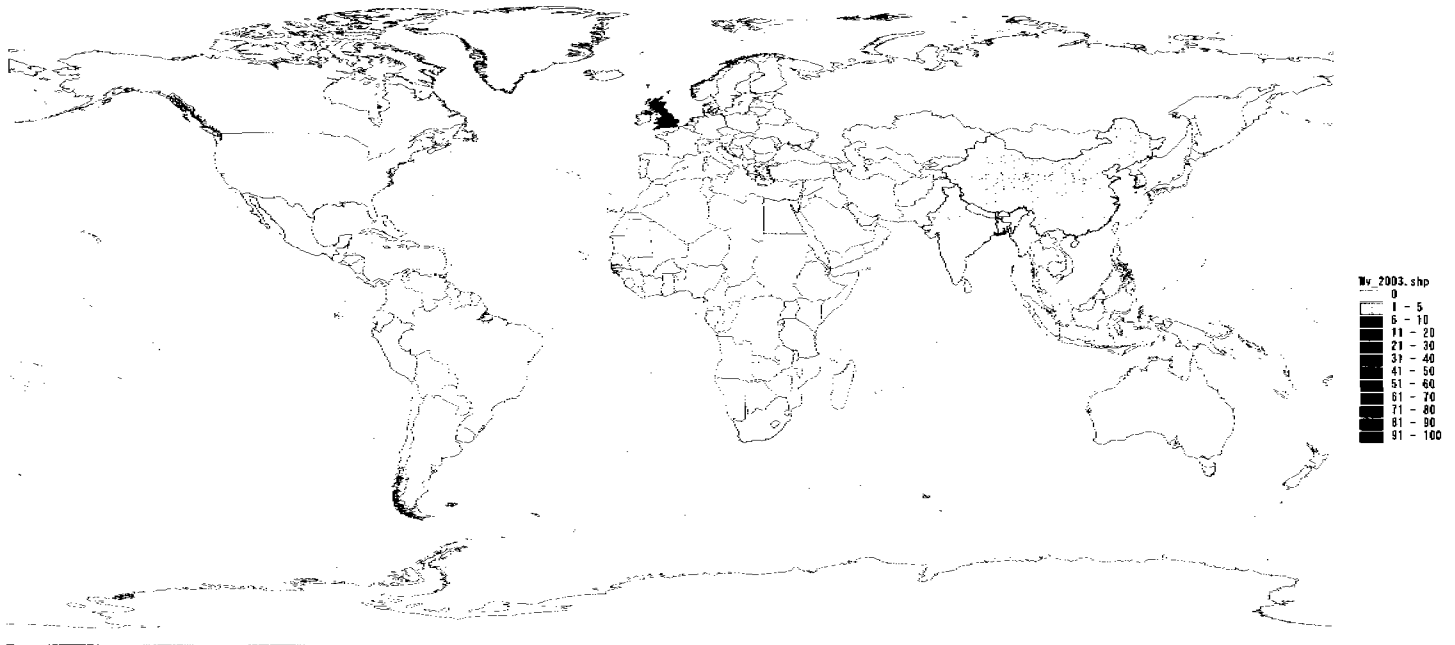
To address the pressing “Water Voice” concerning IWRM collected from around the world, the following measures are considered necessary:

- Participation of ordinary citizens and other people concerned in decision-making concerning shared river basins will contribute to the strengthening of river basin management. This plays a significant role in making the foundation on which to base the improvement of decision-making processes for implementing policies through information disclosure.
- It is important to set goals (such as balancing between human needs and ecosystems) in specific river basins followed by laying down measures for achieving the goals.
- Providing opportunities for cooperation or conferences between nations in a basin will make a huge contribution to the start of policy formulation processes. In addition, technological cooperation (such as data collection and monitoring) will be the first step towards the development of trust between countries in a basin.



## 2.5 Water, Food and Environment

# Water, Food and Environment



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from United Kingdom, China and India are indicated in the darkest red.

## 2.5 Water, Food and Environment

### 2.5.1 Water, Food and Environment in the world

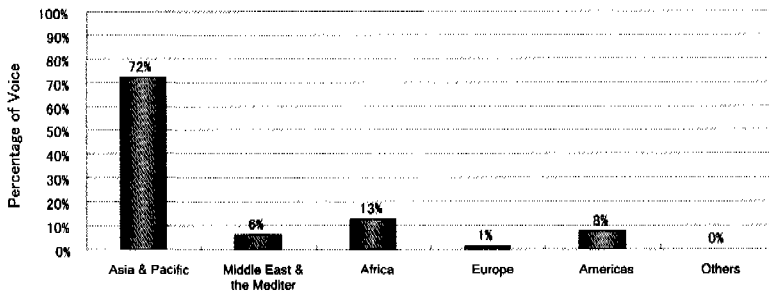
The amount of water used for irrigation in agriculture and the daily life has reached an overwhelming ratio. However, the people involved in the agricultural sector are insisting that the expansion of irrigation is necessary to fulfill the growing food demand, and that this trend will continue for the next 25 years. On the other hand, it is retorted that it cannot become a choice from an environmental point of view any longer since the water consumption by irrigation becomes a social burden, and also damages the environment. It is one of the important problems of the 21st century and it is imperative to solve the difference of opinions between these options.

This section presents “Water Voice” about “Water, Food and Environment” from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving this and related problems

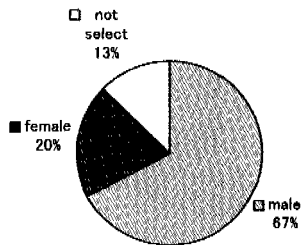
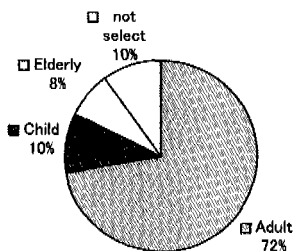
### 2.5.2 Water Voice of the world concerning “Water, Food and Environment”

#### 1) Characteristics of Water Voice Concerning Water, Food and Environment

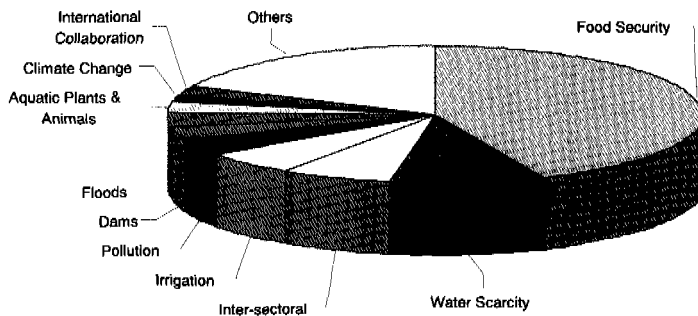
The “Water Voice” from throughout the world concerning Water, Food and Environment, have added up to 79 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Africa and the United States. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 70 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that half of all voices are of males.



Classification by subcategory (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning Water, Food and Environment shows that the relation between food, security, the shortage of water, and irrigation are associated with Water, Food and Environment.



## 2) Listening to “Water Voice” related to “Water, Food and Environment”

In order to solve the problem of Securing the food supply, ways must be created to increase the productivity of the use of water and thus increase food production. The changes in population growth and consumption as well as settlements patterns apply immense pressure on the food production system. As for the food production of the world, it is in a difficult situation, and a lot of poor people have already faced lack of food and the resulting undernourishment. Improving efficiency in agriculture and the productivity of water becomes very important to secure the water resources of the earth in the future.

Moreover, it is an important factor, even if the water comes from irrigation or rainfall, to control the food production in agriculture, and, at the same time, the use of water in agriculture exerts a huge influence on quantity and quality of water in the hydrological system.

It is thought that the following problems are related to Water, Food and Environment when classified as “Water, Food and Environment” according to the previous key word and the actual “Water Voice.”

- Water is not efficiently and reasonably distributed.
- The necessity of sustainable agriculture in harmony with the environment is not recognized.
- The water supply to the farm and the village is insufficient.

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Lack of efficient and reasonable distribution of water

Water, fertilizers, agricultural chemicals, and manpower are all used to further increase production as the population grows, and adequate agricultural lands decrease. A lot of agricultural ecosystems are weak compared with the pressure of increased production. Irresponsible management of irrigation facilities caused the salt accumulation in the soil, and the fertility of the soil was lost by over cultivation. Moreover, it has been proved that the soil hardens when using animals for tractors, and that the groundwater level is falling by excessive pumping for irrigation.

The issue of promoting multi-functionality is being quantitatively discussed by each involved field. But I think that issues of securing food and conserving land are not of multi-function nature, but primary functions. I wish that this issue be addressed more in this fundamental direction. In either case, there is a future need for advanced research in this area.

Adult male of Japan (Voice ID:2436)



## (2) Necessity of sustainable agriculture in harmony with the environment

To support the population presumed to reach, by 2025, almost 8,000,000,000 people, and to improve the eating habits, the world should increase the food production to twice that of the present level. During the “Green Revolution” in the 1960s, it was suggested that the production of food could sharply increase by technical innovations and market mechanisms, but the problem of food security was not considered. For instance, special fertilizers and agricultural chemicals are needed for a new kind of high growth harvest. We now know that it destroys the balance of the ecosystem, and produces new diseases as well as the noxious insect problem.

In the coastal area of the southeast China, owing to the uneven distribution of rain, the high population density and the pollution of surface water, the exploitable water resources per capital is low and the seasonal water shortage occurred frequently. Irrigation water used for paddy is more than 50% of the total water supply. Techniques of saving water in irrigation for paddy have been applied; the paddy irrigation without submersion is one of them. Because the surface runs off and underground seepage loss and evapo-transpiration were reduced, the efficiency of the utilization of the irrigation water and rainwater was raised. The amount of irrigation water were reduced by 30-50%, while the yield of paddy was increased by 5-10%.

Adult male of China (Voice ID: 10811)

## (3) Lack of appropriate water supply to the farm and the village

The current situation is that a large population is facing a shortage of safe drinking water in addition to water for irrigation. When writing policies, priority must be given to the fundamental sufficiency of drinking water, especially in poor areas, and then to agricultural production.

Water shortage in the Sindh province of Pakistan is causing crop deficiency and damage to agriculture product. Adequate supply of water is needed during the ongoing wheat and sugarcane season while the orchards also need proper water supply. The authorities have revised the wheat production target for the current year downwards due to impending water shortage. The situation may also result in the rise in price of wheat, flour and sugar in the urban areas. The situation will also adversely affect the overall economy of the province as it will have to spend more on the purchase of food supplies.

Adult male of Pakistan (Voice ID:22835)

### 3) Observations

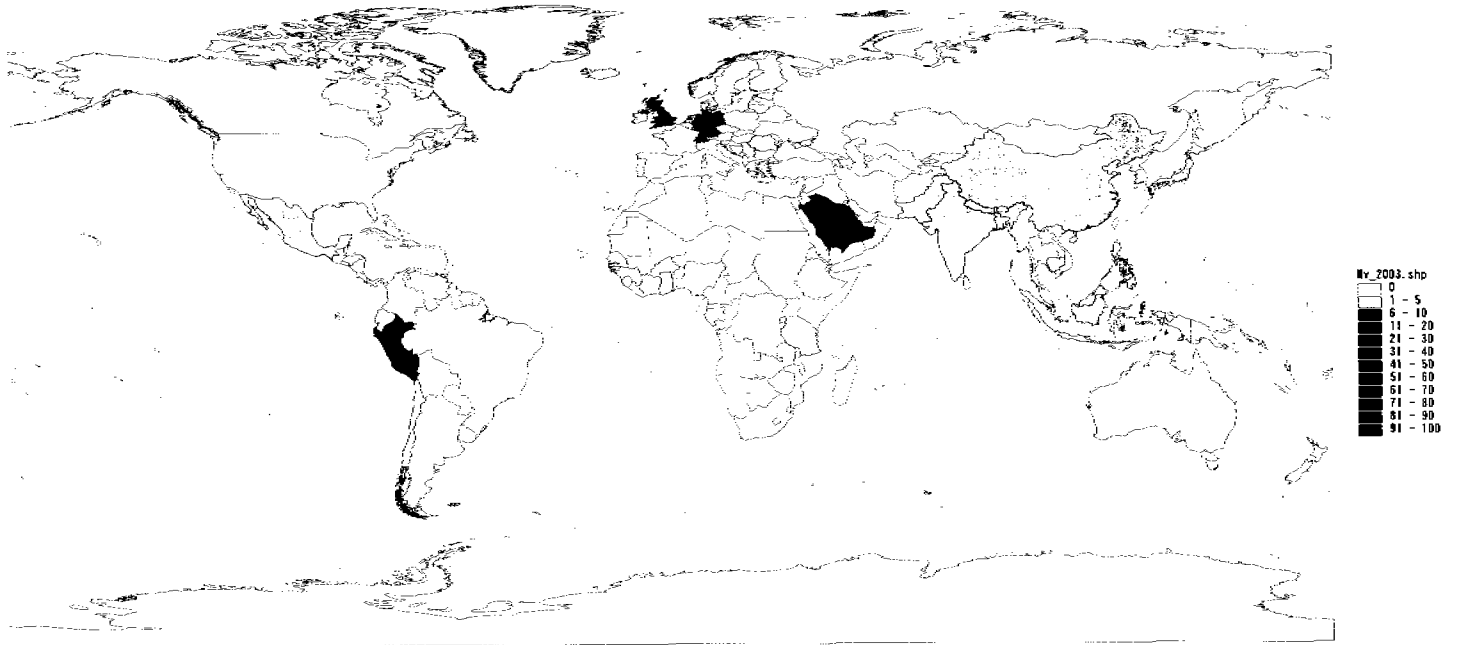
The following alternatives are expected, although it is not easy, to achieve the more productive and maintainable water supplies, fulfilling the food demand, which continues growing.

- The local activities for water-resources management and delegations become important, and the resources to secure local residents (especially poor people) food supply. The means, which raise the productivity of water, and the resources to satisfy the food demand in urbanized areas, are given priority.
- The water resource management is developed in an inclusive policy of “Health of the person,” “Food production,” “Disaster reduction plan,” and “Maintenance of the environmental protection and the natural resources.”
- The offer of water supply and hygiene to impoverished people in agricultural villages, where such a service is not enjoyed, is actively supported.



## 2.6 Water and Climate

## Water and Climate



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Swiss and United Kingdom are indicated in the darkest red.

## 2.6 Water and Climate

### 2.6.1 Water and Climate in the world

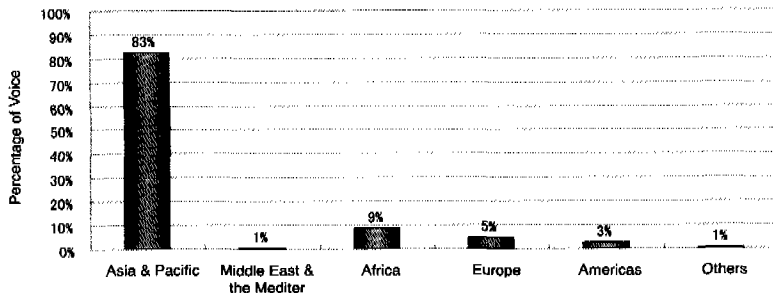
An extreme situation has arisen, as the water problem is accompanied by the important climate variations of the earth. In the ten years from 1991 to 2000, 90% or more of the natural damages occurred and many people died because of tremendous hydrologic phenomena such as localized torrential rains and floods. It is forecasted that this hydrosphere circulation will intensify further by the climatic variations in the future according to Intergovernmental Panel on Climate Change. It is already rising, and the scale and frequency of water disasters such as localized torrential rains and floods have increased. Scientific discussions and policy negotiations are conducted about the relations of the influences on global warming and the hydrosphere circulation in United Nations Framework Convention on Climate Change (UNFCCC). However, although the climate changes about the hydrosphere circulation and its influence have serious influence on the lives of many people, the dialog between the water specialists and the climate specialists have just started.

This section presents “Water Voice” about “Water and Climate” from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving this and related problems.

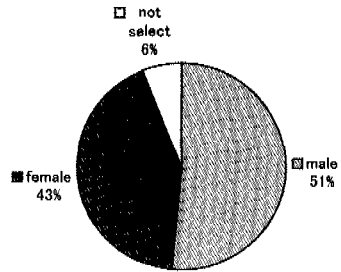
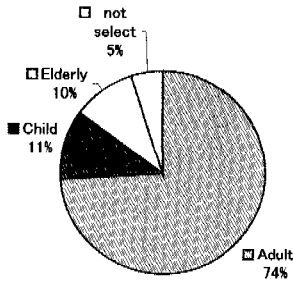
### 2.6.2 Water Voice of the World Concerning Water and Climate

#### 1) The “Water Voice” from throughout the world concerning

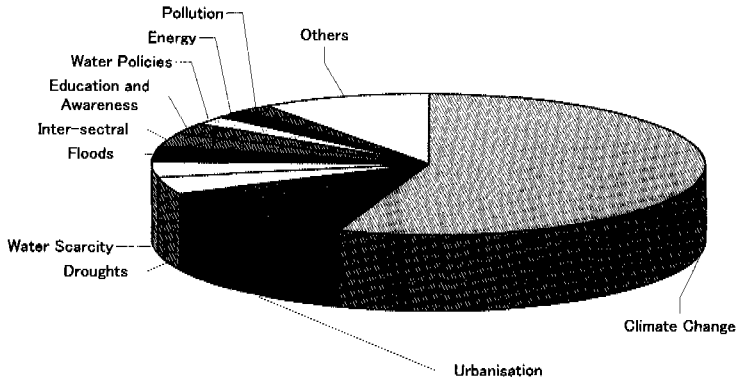
Water and Climate have added up to 160 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Europe and Africa. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 70 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that half of all voices are of males.



Classification by subcategory (47 categories<sup>1)</sup> specified by the contributors of “Water Voice” concerning Water and Climate shows that climate change, urbanization, and the drought are associated with Water and Climate.



## 2) Listening to the “Water Voice” related to “Water and Climate”.

Abnormal weather, according to the standards scale, shows a tendency to increase in the world. The change in the amount of rainfall on a region influences the seeds and the production of crops, and there is a possibility of causing a decrease in food production.

It is thought that the following problems are related to “Water” and “Climate change” when classified as “Water and Climate” according to the previous key word and the actual “Water Voice.”

- As for the influence that the climatic variations exert, there are a lot of uncertain points.
- The climate listens hour by hour to the actual “Water Voice”, the insufficiency in the regions where the changing climate and its negative influence are caused by the above-mentioned problem. We can then deepen our perception about the present state of affairs of the water problems in the world.

### (1) Influence that climatic variations exert

Most of the influence on the human body by the climatic variations happens through water. An abnormal temperature, abnormal weather, pathogens, the animals geographic distribution, the climatic variations of air, food, and the volume of water widely influence the stability of the ecosystem from which we depend. However, it is a current state in the mechanism that still a lot of uncertain points have been left as a problem.

Few days ago, Riyadh lived the four seasons in the same day, very cold in early morning till it reach the usual temperature (35-45 degree Celsius). When we go to our schools, we don't know what to ware. At the 2nd, 4th and 5th of January, rains fell, really fell with big quantities, the water washed the streets, trees and the land got what it was always asking for. The weather now is great, and the rains still falling. The water situation in Peking is not that serious yet. But outside the city, a desert is growing and has reached to be within 7 km up in the northern area. I worry about the climate changes and how they will affect the spread of the desert.

Adult male of Saudi Arabia (Voice ID: 1101)

There was thunder, storm and hail on 28th December 2001 in Holland. I remember how it was 25 years ago when we had a period of three weeks of permanent snow cover at this time of year. It's definitely the sign that the climate has been changed. I couldn't imagine thunder in December till 28th December this year.

Adult male of the Netherlands (Voice ID: 823)



The last 40 years the temperature in Moscow increased in 0.02 grad. per year. The precipitation is on 20-30% more than annual average. May be it is positive side of climate warming that we should not wear so many warm clothes in winter. But summer is getting colder. According to investigations climate on the earth was already changed and may be this warming is temporary.

Adult male of Russia (Voice ID: 2222)

### (2) Influence on regions by climatic variations

If the temperature rises and precipitation decreases, the moisture in the soil will decrease centering on a part of the torrid zones or inland in many areas, and the dire harvest of crops and the appalling cycle will progress in water reduction for irrigation in the area. If the amount of rainfall decreases further, falling into a critical situation that crops do not grow up at all, it will be similar to a dry region where crops hardly grow up even now.

The water situation in Peking is not that serious yet. But outside the city, a desert is growing and has reached to be within 7 km up in the northern area. I worry about the climate changes and how they will affect the spread of the desert.

Adult male of China (Voice ID: 1408)

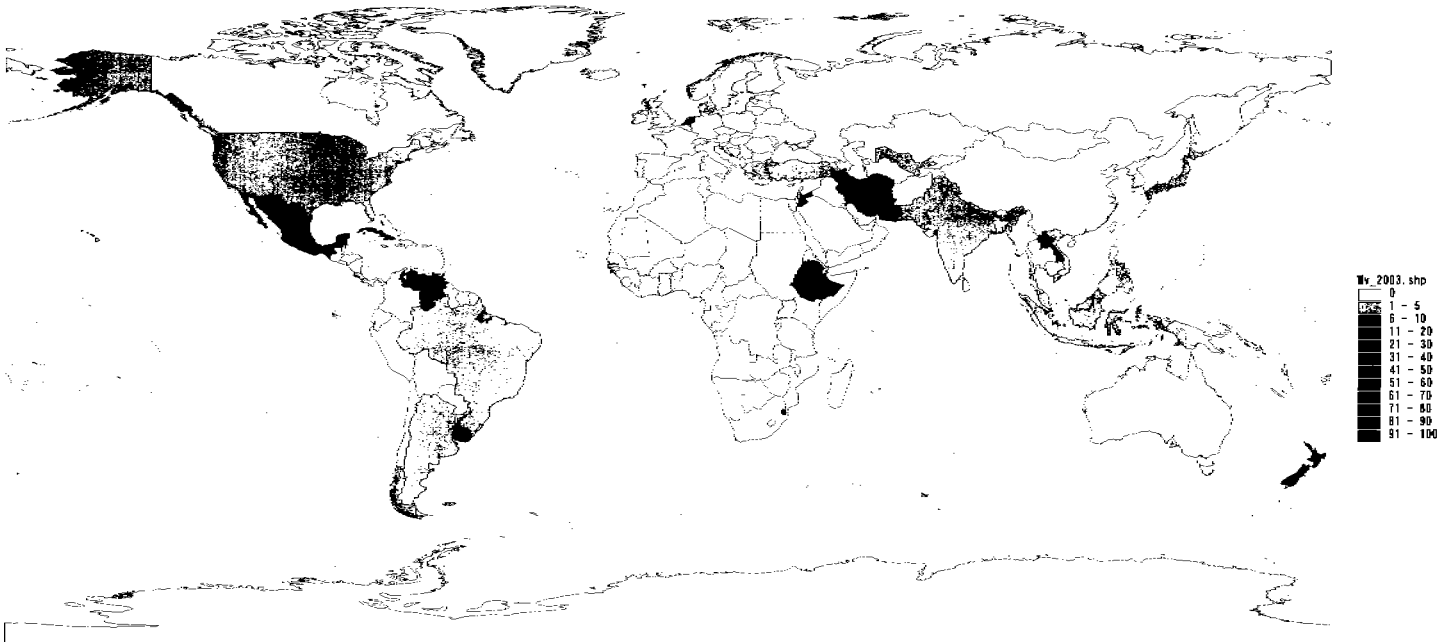
### 3) Observations

It is considered that the following alternatives are necessary to alleviate the influence of the increasing climatic variations.

- Understand, and quantify the threat of the influence of climatic variations on the fresh water resources.
- Promote the execution of effective national measures when the influence, which causes the threat, is confirmed.

## 2.7 Water and Cities

## Water and Cities



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Uruguay, Ethiopia and Venezuela are indicated in the darkest red.

## 2.7 Water and Cities

### 2.7.1 Water and Cities in the world

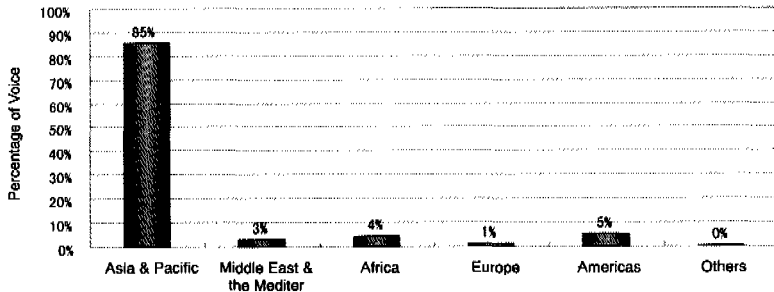
More than half of the world population is concentrated in the cities and on only 4% or less of the total land of the earth. Therefore, a variety of water problems like the hygiene problem are generated mainly in the cities. Consequently, the remarkable water problem in metropolitan areas becomes a common problem all over the world.

This section listens to the “Water Voice” related to “Water and Cities” drawn from all over the world in order deepen our understanding of the current state of the problem of “Water and Cities.”

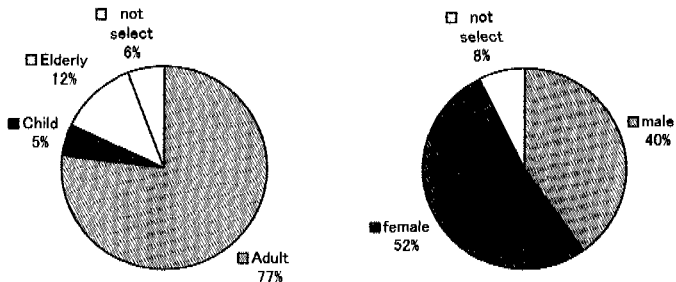
### 2.7.2 Water Voice of the World Concerning “Water and Cities”

#### 1) Characteristics of Water Voice Concerning “Water and Cities”

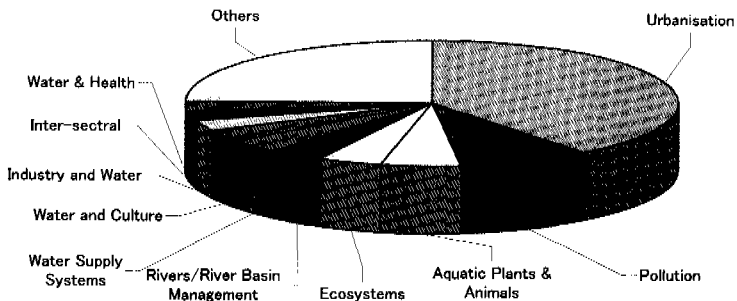
The “Water Voice” from throughout the world concerning Water and Cities have added up 357 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Europe and Africa. Among Asia Pacific countries, from which most voices have come, Japan accounts for nearly 90 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that half of all voices are of males.



Classification by subcategory (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning Water and Cities shows that urbanization, contamination of water, aquatic plants, animals and the ecosystem are associated with Water and Cities.



## 2) Listening to the “Water Voice” related to “Water and Cities”

The population concentration in the cities is continuing now, and pushes up the population density further in the developing countries and in the advanced countries, sooner or later. In the city, there is a tendency to think that chances of economical improvements through education and that the medical resources are more plentiful. The cities account for only about 4% of the total land of the earth, and half of the world population lives there. It is considered that 60% or more of all the population of the world will live in the cities by 2030. The progress of urbanization is fast, and especially remarkable in developing countries. The city is explosively growing. The population of the city is increasing three times as fast as the neighboring population of today. Urbanization more than population growth causes various water problems.

It is thought that the following problems are related to “Water” and “Cities” when of classified as “Water and Cites” according to the previous key word and the actual “Water Voice.”

- Aggravation of water short supply according to population increase in cities and the deterioration of hygiene
- Increasing vulnerability of the cities to natural disasters

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

#### **(1) Aggravation of water short supply according to population increase in the cities and the deterioration of hygiene**

When the pace of urbanization advances, it often becomes a load that is excessive for the government and the local government only to provide the most basic services for people who live in the city. The slum and squatters area, in which almost 25 - 50% of the urban population of the developing countries is living, is underprivileged. In those districts, the services of water, drainage, and garbage collection is almost not received or not at all. In such a situation, the quality of the environment and health can easily become a serious crisis for the population living there.

There is frequent closure of the taps. The booster has become small as a result of the increase in population. It is unable to serve the population of the catchment area. It is normally closed for over two weeks. It is my wish that the water flows all the time without any interruption.

Adult male of Ghana (Voice ID: 2689)

It is a big problem to which the measures of administrative authorities in the provinces, cities, towns, and villages are barely meeting. The increase of the influence that urbanization exerts on the demand for water, and the way the overall process is managed cannot solve the aggravation of water shortage in the city as well as the hygiene deterioration.

There are 2 major problems in Iran regarding water issues. One: no planned land development projects, and two: no population control policy. Due to forests being cut down without predicting consequences, conservation of water is now becoming difficult where groundwater is drying up. Also, overpopulated cities create water shortages during the dry seasons. There sure is a need for education on teaching people how to utilize water more efficiently.

Adult male of Iran (Voice ID: 1405)

The population's concentration and the industrial production that occurs in the great Latin American metropolitan areas (Mexico City, Buenos Aires, Sao Paulo, Rio), take part like important causal factors of water pollution: I mean a growth in the conventional sewage systems has not been accompanied by corresponding facilities of recycling process; or maybe the intensification in the use of agricultural lands near the metropolitan areas; more over the changes in the economic structure

A Mexican citizen (Voice ID: 209)

## (2) Inadequate city planning unable to sustain natural disasters

Urbanization increases the danger of floods. If roads, buildings, and other sorts of permeable elements have covered the surface of the earth, the risk of flash floods will increase and their scale will also augment. When 50% of the valleys are urbanized, the ratio, to which the floods occur, has the possibility of going up from once every 100 years to once every 5 years.

In many of the developing countries, about half of the people who live in a large city have a place of residence that is located in many cases, in places vulnerable to disasters, such as the flood plain, the hillside or the dumpsites. As a result, it becomes difficult for the residents to survive a disaster. Moreover, after the disaster, they also have little resources, which should be relied on when it comes to surviving and rebuilding.

Flood, which happened in Jakarta several months ago, were caused by an inconsistent city planning systems. As a result, the function of drainage system has been changed and water absorption area is has been decreased, and then it cannot keep water in. The problem above becomes more serious due to insensitive community who are not aware of the importance of cleanliness. They are not aware of throwing garbage into its place, choosing the organic or inorganic garbage, and having changed the existing drainage system and rivers to the gutter used as a garbage dump. Piles of materials from road constructions and utility works have changed the functions of the drainage system and rivers.

Adult female of Indonesia (Voice ID: 2521)

### **3) Observations**

Up to now, the urbanization related to rapid population growth was the main cause for the economic growth of a country. It is forecasted that these tendencies will continue in the future, and it is accelerating in some countries. The daily water consumption in the city depraves the water quality with waste. It is thought that the following alternatives are effective to solve the water problems that such a city has.

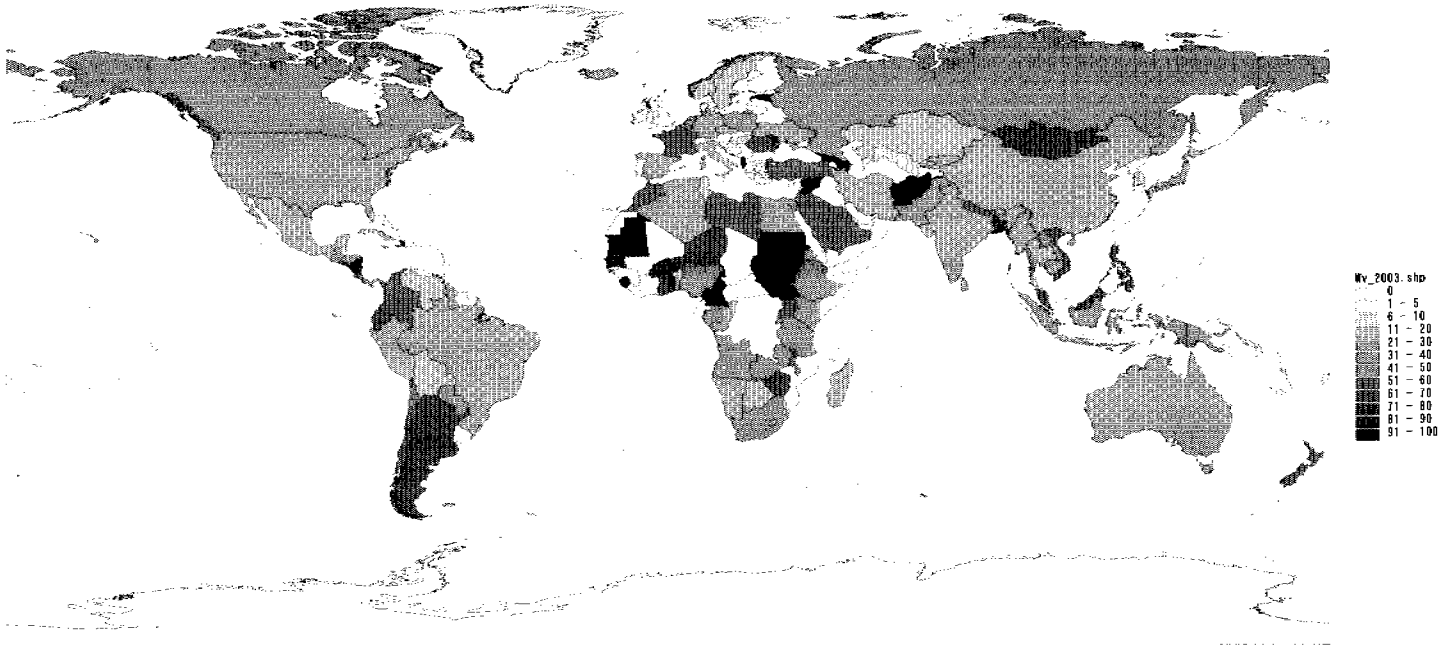
- Control the drain of water resources, protection from contamination, efficient and fair distribution of water resources
- Promotion of development projects design to ease natural damages





## **2.8 Water Supply, Sanitation, Hygiene and Water Pollution**

# Water Supply, Sanitation, Hygiene and Water Pollution



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Syrian, Afghanistan, Sudan and Cameroon are indicated in the darkest red.

## 2.8 Water Supply, Sanitation, Hygiene and Water Pollution

### 2.8.1 Water Supply, Sanitation, Hygiene and Water Pollution in the world

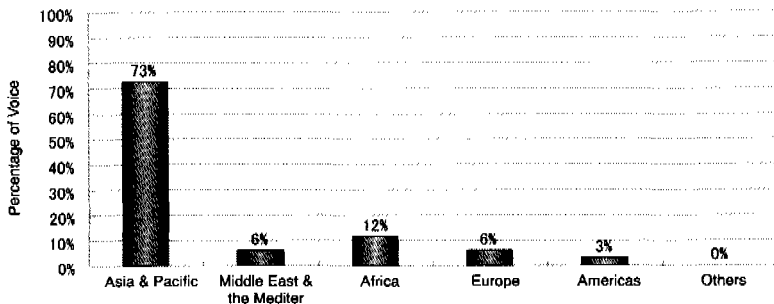
Because 2.4 billion people cannot access appropriate sanitary facilities in the world, 1.1 billion people cannot use safe drinking water. Moreover, even if it is possible to use safe water, there are many countries, which have health problems because of the quality of water resources, and such a situation has led to frequent sickness in the population.

This section listens to the “Water Voice” related to “Water Supply, Sanitation, Hygiene and Water Pollution” drawn from all over the world, and deepen our understanding of the current state of affairs in order to solve the problem of “Water Supply, Sanitation, Hygiene and Water Pollution.”

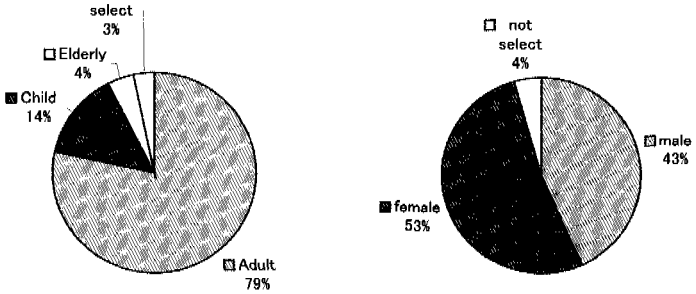
### 2.8.2 Water Voice of the World Concerning Water Supply, Sanitation, Hygiene and Water Pollution

#### 1) Characteristics of “Water Voice” concerning Water Supply, Sanitation, Hygiene and Water Pollution

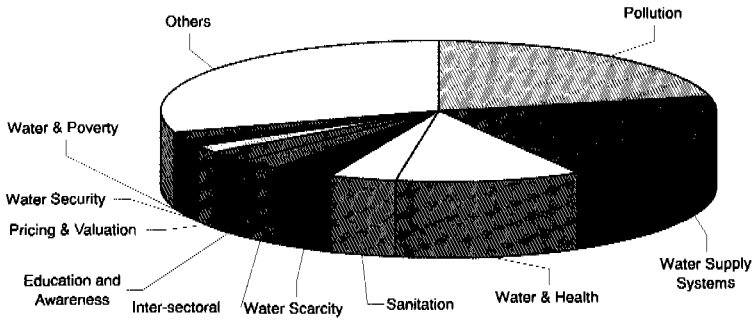
The “Water Voice” from throughout the world concerning Water Supply, Sanitation, Hygiene and Water Pollution have added up to 9,314 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Africa. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 70 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that half of all voices are of females.



Classification by subcategory (47 categories<sup>1</sup>) specified by the contributors of “Water Voice” concerning Water Supply, Sanitation, Hygiene and Water Pollution shows that pollution of water, the water supply, and hygiene are associated with Water Supply, Sanitation, Hygiene and Water Pollution.



## 2) Listening to the “Water Voice” related to “Water Supply, Sanitation, Hygiene and Water Pollution”

A safe water supply and environmental sanitation are necessary and indispensable for environmental protection as well as for the reduction of poverty and the promotion of health. Safe water is extremely important for a lot of traditional and cultural activities.

It is considered that the following problems are related to “Water” and “Water Supply, Hygiene, and Pollution” when classified as “Water Supply, Sanitation, Hygiene and Water Pollution” according to the previous key word and the actual “Water Voice.”

- A lot of people in the developing countries have difficulties accessing drinking water
- A lot of people in the developing countries are in a situation in which safe, clean water is inaccessible
- There is degeneration of the river water quality because of the inflow of agricultural drainage in addition to the drainage from households

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Developing countries where access to drinking water is difficult

There is regional injustice for the water and about 40% of world population lives in areas of water-shortages, and about 30% live in precarious water supply areas. Furthermore, when we assume that the present consumption pattern will continue, 3,5 billion people, who account for 48% of world population, at least in 2025, will reside in river valleys that suffer from water shortages, and 2.4 billion people will live in very precarious conditions.

Our main problems in rural communities are the following:

- Walking long distances about 2 to 3 kilometers daily to public tap
- Carrying heavy containers on our heads 20 to 25 liters per trip
- Long queues at the point of taps. This takes long hours and waste time that could be used in valuable manner.
- Should there be contamination at this common point the whole village is at risk.
- There is a possibility that we will in the near future have to pay for water. A big problem for unemployed people.

Adult female of South Africa (Voice ID: 8363)

I am staying in Mwanakwele area in Zanzibar. There is no water problem in the area. We are supplied with clean and safe water from the taps. However, when the electricity power cut occurs, the supply stops or get interrupted. I advise that the people should instal storage tanks/reservoirs in their homes.

Adult male of Tanzania (Voice ID: 192)

## (2) Unsanitary water facilities

One person or child dies every eight seconds in the world because of illness caused by water. Moreover, 50% of the people in the developing countries suffer from diseases related to water, and it is assumed that sewage is the cause for 80% of the health problems in the developing countries. In the developing countries, it is recognized that human excreta and drainage are important causes that deteriorate the water quality, and the introduction of new technologies and the related skills is necessary.

In the past, our village uses piped water, but the water supply was stopped 3 months ago. We are now using water from wells or streams. There are 97 households in the village with 25 wells, some of the wells have alkaline water problem. Due to the bad quality of water, over 50 percent women in our village are now suffered from gynecological diseases.

A woman in Vietnam (Voice ID:6675)

The supply of water in Tarime District is at most available in the low-density areas. Accessibility to water in other areas of the town is very difficult. The water is consumed without any prior treatment and without even getting rid of foreign particles that enter into the storage tanks. New sources of water are available and there is a possibility of replacing worn out pipes. There is need however to improve the quality of water by treating it before use. All stakeholders including the government, NGOs, and able-bodied individuals should contribute financially to the improvement of the water supply systems and provision of necessary equipments to improve the situation.

A woman in Tanzania (Voice ID:137)

## (3) Water pollution of rivers

Water pollution with chemicals is also serious. A lot of elements deprave the water quality like poisonous compounds such as sewage, waste, commercial fertilizers, heavy metal, microorganisms, industrial solvents, toxic compounds including oil and agricultural chemicals, irrigation-derived sodium, acid rain, and silts. However, it is such an extremely difficult situation that even the industrialized countries cannot manage the new kind of water pollution. The conventional polluters, in addition to this, exist in the developing countries, and the water quality is awful at the moment.

Water they say is the gift the nature has given to the mankind. Till very recently water was available free of charge in Sri Lanka. About 50 years ago, most of the streams, rivulets and waterways were full of tiny fish and the waters were crystal clear. However, due to the pollution, you hardly see any fish in the same waterways and the crystal clear water has now turned to murky or muddy brackish water. Pollution is the result of human negligence, such as dumping garbage including human excreta, which overflows from domestic cesspits and septic tanks to neighborhood waterways. It is very common in Sri Lanka to discharge offensive matter including chemicals from factories to the waterways without treating them.

Adult male of Sri Lanka (Voice ID: 6775)

In my neighborhood, there are many paddies irrigating water from a canal. Although kids played and fished fish, frogs and crabs in river, now river water is too contaminated for creatures and kids are hardly seen playing there. I am worried if the rice grown up with contaminated water from the canal is harmless for our health. I think the community should try to maintain safe water.

Adult female of Jordan (Voice ID: 6699)

### 3) Observations

Although the situation may differ in various regions, in order to secure the most fundamental needs, it is considered that the following alternatives are required.

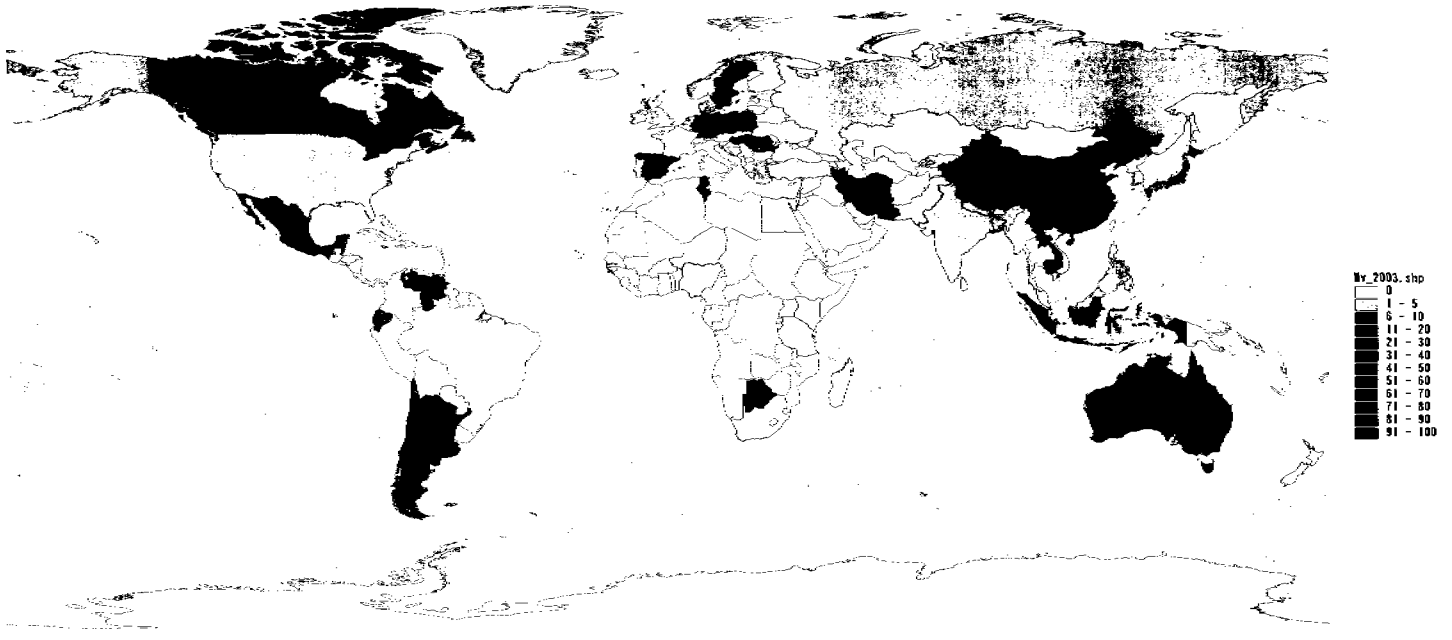
- It is indispensable to supply good-quality water. It is necessary to rely on local rivers of as much as possible. When supply from the outside is necessary, a regional organization should do the management.
- Education and better awareness concerning water and hygiene are important, and it is indispensable to make the regional organizations participate regarding the sustainable supply of water and sanitary facilities.
- The regional water processing system and low-cost recycling by technical improvements should be expanded, and technical improvements of desalination and rainwater collection are necessary to improve the quality of stream water.





## 2.9 Water, Nature and Environment

# Water, Nature and Environment



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Poland, Czech and Spain are indicated in the darkest red.

## 2.9 Water, Nature and Environment

### 2.9.1 Water, Nature and Environment in the world

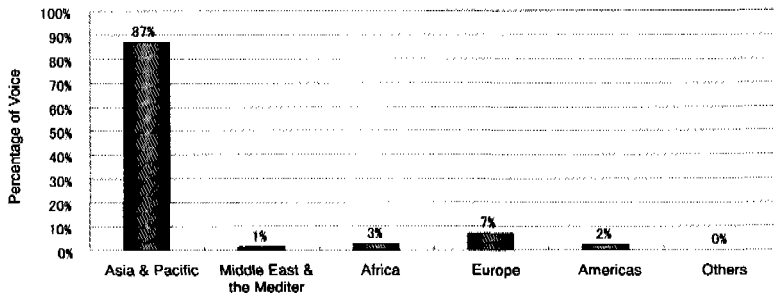
The fresh water ecosystem, which exists in the water environment, is on the verge of a critical situation. The deterioration of the ecosystem caused by water pollution has decreased the number of living organisms in fresh water and a negative influence on the economy appears in many regions all over the world. In the “Water and Nature” vision of the 2nd World Water Forum, “Water in the entire valley and the management of the land use” was deemed important to maintain the functions of the ecosystem.

This section presents the “Water Voice” about “Water, Nature and Environment” drawn from all over the world which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of “Water, nature, and Environment.”

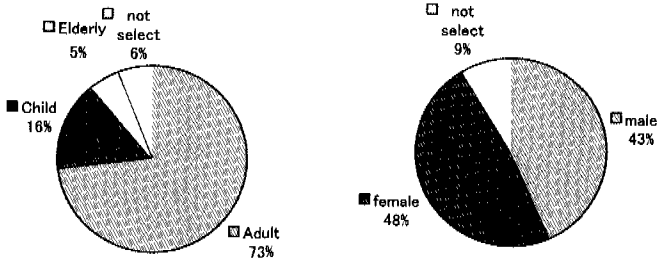
### 2.9.2 Water Voice of the World Concerning Water, nature, and Environment

#### 1) Characteristics of Water Voice Concerning Water, nature, and Environment

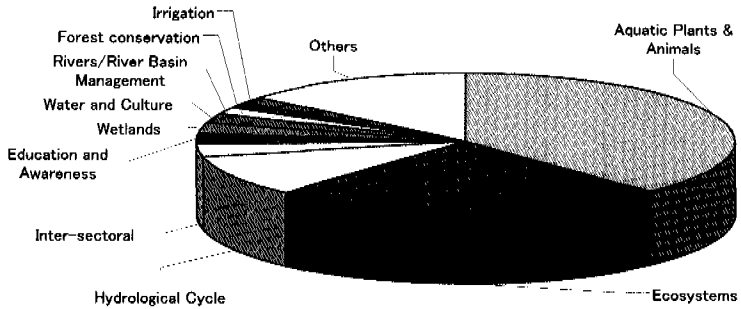
The “Water Voice” from throughout the world concerning Water, Nature, and Environment have added up to 1,077 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by Europe. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 80 percent of all the voice.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that the voices from females slightly outnumber those from males.



Classification by subcategory (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning Water, Nature and Environment shows that the hydrophytes, the animals, the ecosystem, and the water circulation are associated with Water, Nature, and Environment.



## 2) Listening to the “Water Voice” related to “Water, Nature, and Environment”

The problem of (Protecting the ecosystems) is to execute the maintenance of the ecosystem surely through sustainable water resources management. It is indispensable to prevent the ecosystem from deteriorating, and to improve it to secure the water resources. Maintenance by conventional methods can achieve constant results but we can expect a sustainable future only through new management strategies. The most important problem in the 21st century is to maintain good quality conditions as much as possible.

It is considered that the following problems are related to “Water” and “Nature and the Environment” when classified as “Water, nature, and Environment” according to the previous key word and the actual “Water Voice.”

- Decline of the fresh water ecosystem
- Decrease in the resources of the ecosystem

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Decline of fresh water in the ecosystem

The ecosystem, which depends on rivers, lakes, and mangroves in all parts of the world, along with the aquatic ecosystem such as marshes, are both declining in surface and quality.

Because the water cycle functions as a treasure house source where it creates a lot of resources and various living things, these ecosystems are important. With the vision of “Water Nature and Environment,” unless the present trend is reversed, it is suggested that it will become impossible for many of these ecosystems to supply the resources required for the survival of humanity. The number of wetlands is rapidly decreasing and it is terrible because it increases erosion and floods, and also because the natural elements cannot play their role of flood reducers anymore.

We live on the island village in the Mekong River. Our agricultural land has been flooded every year and we cannot plant any crops during the wet season. We were not fear about normal flooding and we drink or use very poor water quality from the river everyday, however, we adapted to this situation. After flooding time, we begin to cultivate our crops and go fishing. In the summertime, the river water is very far from the river is bank so the villagers who have no water well having difficulty to go to collect water for use. In some places, the water level of the river is very low and running through the process of siltation, and at the same, the fishes and other aquatic animals could not live in it and some species had been died. If we compare to many years ago, the amount of fish in the river has been decreased from year to year.

Adult male of Cambodia (Voice ID: 3528)

The world's six billion population are already appropriating just over half of all the accessible freshwater contained in rivers, lakes and underground aquifers. By 2025 humankind share will be at least 70 percent. This conservative estimate reflects the impact of population growth alone. If per capita consumption of water resources continues to rise over 90 percent of all available freshwater within 25 years, leaving just 10 percent for the rest of the world's species. Apart from thinking for humans only, we should also think about the other species surviving on Earth, The world water forum should also have a discussion regarding the survival of other species and how to manage this big world with small ideas.

Adult female of India (Voice ID: 3763)

## (2) Decrease of fresh water resources in the ecosystem

The decrease of living organisms and the destruction of habitats has dramatic effects in the world. The biodiversity is severely reduced; a lesser amount of fish is caught at the same time as the demand of proteins is increasing. In order to meet that demand, more cattle rising and agriculture are done. Moreover, almost all rivers are turned into sewers, which carry contaminants to the coast and to the sea. It then becomes impossible for living organisms to live and grow in the ecosystem.

Several species of freshwater fishes in North East India like *Chitala chitala* (featherback), *Tor* spp. (Mahseers), *Ompok* spp., *Nandus nandus*, *Gadusia chapra*, *Puntius sarana*, *Labeo gonius*, *Garra* spp., *Bagarius* spp., someloaches and others are becoming increasingly rare due to factors like overfishing, pollution by heavy metals and pesticides and indiscriminate construction of dams and embankments. Appropriate protection measures need to be adopted immediately to save the dwindling populations of these animals who also share this planet with us.

Adult male of India (Voice ID: 5488)

## 3) Observations

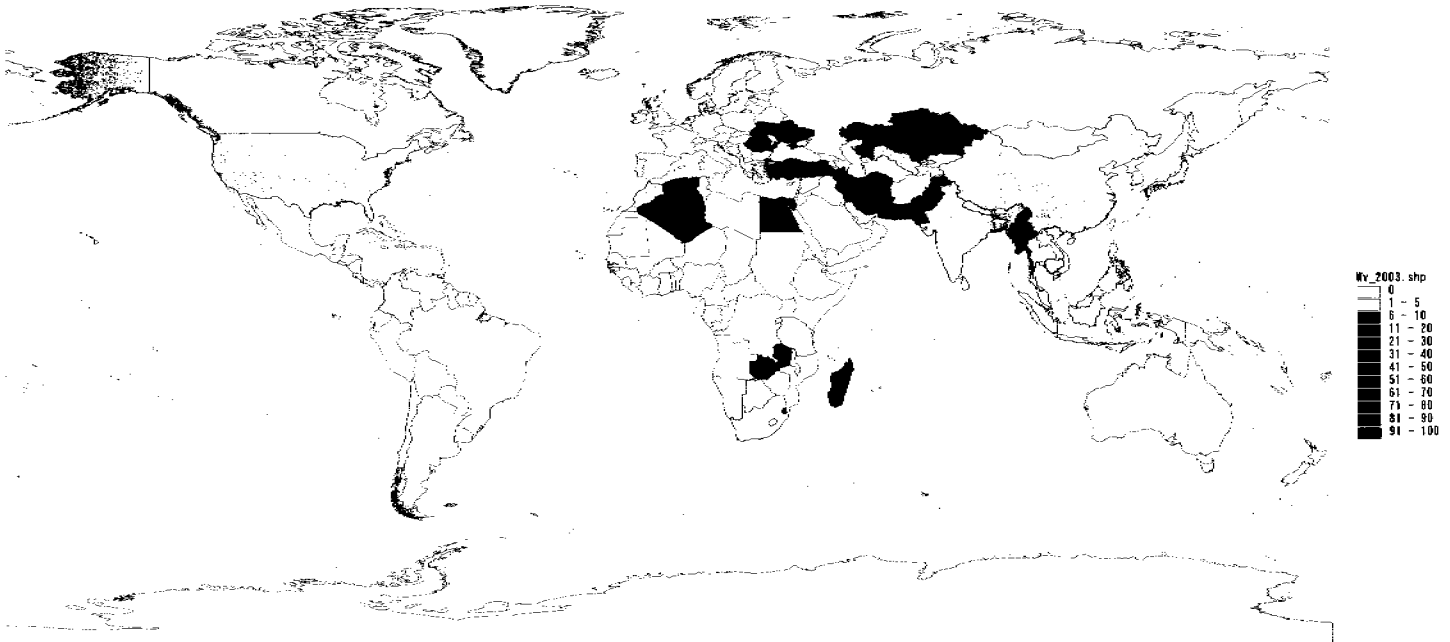
The key to prevent such harmful changes is to value the ecosystem for its water resources and all sides of management should be involved. It is thought that the following alternatives are necessary to achieve this.

- The maintenance and the restoration of fresh water and the related ecosystem are executed as the main goal of the water resource policy and the integrated water resources management.
- Commitments are aimed at the creation of fresh water environments and related ecosystems, as well as to promote a sustainable water resources use.

## 2.10 Agriculture, Food and Water



## Agriculture, Food and Water



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Egypt, Ukraine, Zambia and Kazakhstan are indicated in the darkest red.

## 2.10 Agriculture, Food and Water

### 2.8.1 Agriculture, Food, and Water in the world

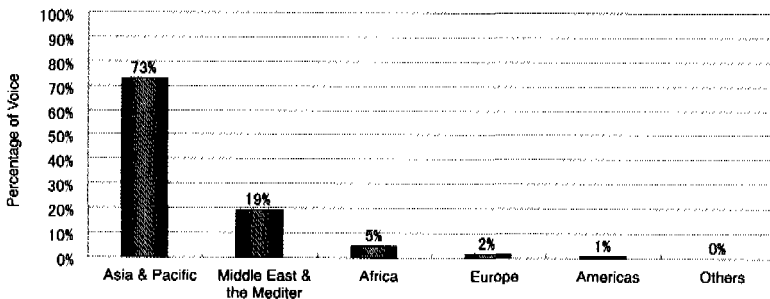
It is forecasted that the world's population will increase to 8 billion people from the present 6 billion people in 2025. The production of food has a 1.3% increase per year, and it was estimated in 2000, that the increase in population and the insufficient growth of food production would generate a large-scale food shortage. Moreover, the shortage of water caused by the population increase is forecasted since 70% of the water is used for agriculture.

This section presents the "Water Voice" about "Agriculture, food, and Water" drawn from all over the world which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of "Agriculture, Food, and Water."

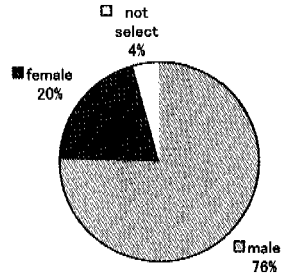
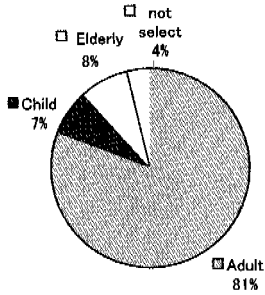
#### 2.10.2 Water Voice of the World Concerning Agriculture, Food, and Water

##### 1) Characteristics of "Water Voice" concerning Agriculture, Food, and Water

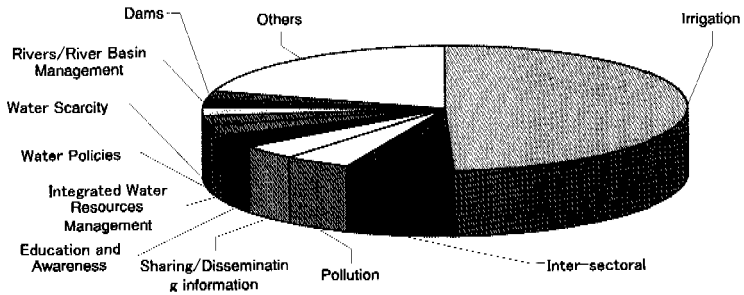
The "Water Voice" from throughout the world concerning Agriculture, food, and Water have added up to 467 as of the end of January 2003. Classification of them by region is topped by Asia and Pacific (especially Asia), followed by the Middle East, the Mediterranean Sea region, and Africa. Among Asia Pacific countries, from which most voices have come, Japan accounts for about 60 percent of all the voices.



When classified by age, voices of adults account for about 70 percent followed by voices of children and classification by gender shows that the number of voices from female slightly outnumber those from males.



Classification by subcategory (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning Agriculture, Food, and Water shows that the information sharing/transmission concerning the pollution topic of irrigation and water are associated with Agriculture, Food, and Water.



## 2) Listening to the “Water Voice” related to “Agriculture, Food, and Water”

The challenge of “Securing food supply” is to strengthen the security of the food ration by increasing the productivity of water for food production. The changes in the population growth and consumption as well as settlements patterns will apply immense pressure on the food production system.

It is considered that the following problems are related to “Water” and “Agriculture and Food” when classified as “Agriculture, food, and Water” according to a previous key word and the actual “Water Voice.”

- Improvement of efficiency in agriculture and productivity of water
- The use of water in agriculture exerts a large influence on the amount and quality of water in the system

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Efficiency in agriculture and improvement of the productivity of water

Agriculture needs exceptional volumes of water, and it accounts for maximum of 90% of the water supply in many countries. The food production of the world depends on the obtainability of water. The demand for food is presumed to increase between 2000 and 2025 by 30 - 40%. Filling this demand by a sustainable method becomes possible only by the increase of the harvest resulting from improvements of the productivity of water.

I am a farmer doing farming in my village in Solapur District. I have total 85 acres land. We are facing water problem. Before 1985 we were irrigating our land through well water. But after 1985 water table gone down so we have taken one bore well. It was found successful for one year only. Then after 1985 we are continuously taking bore wells in our land. Up to date we have taken total 19 bore wells. Out of which only 3 are having water. Our first bore was 110 feet deep and latest is 400 feet deep. And 400 feet deep bore has no water. As water table is going down, it will become difficult for farmers to do their farming. We are using drip irrigation system and saving water. Water conservation and ground water recharge is necessary and for that government has to do necessary action.

Adult male of India (Voice ID: 9328)

Water shortage is becoming a serious problem. The water is used to expand agricultural land to be able to produce enough food. But people are not aware that this is causing a water shortage problem. Irrigation works are progressing, but they should only be allowed up to a certain extent.

Adult male of Bahrain (Voice ID: 1403)

There are two different plowing methods for paddy. Shallow plowing saves water consumption but gives us low yield. Deep plowing consumes much water but gives us high yield. Each farmer decides between the two by his own point of view.

Adult male of Egypt (Voice ID: 5077)

### (2) Influence of the systems on water supplies for agriculture

The use of water in agriculture has a huge influence its quantity and quality in the hydrological system. The problem of pollution with agricultural water containing agricultural chemicals, for instance, and the environmental problems caused by the irrigation are all elements that contribute to the situation.

The biggest damage to the lake comes from the practices of State Hydrologic Works. The pumping of the agricultural waters pollutes the lake. In addition, the industrial wastewater and the coalmine ruin the lake. The people have to get more involved; we cannot get further than words. The management is lacking and irrelevant. The state takes action only in their interest.

Adult male of Turkey (Voice ID: 17404)

I was astonished because many bubbles were rising in the irrigation canal near my house. I was shocked because I could swim there before. First of all, I want to begin with the basic reforms that I can do by myself.

Adult male of Japan (Voice ID: 2849)

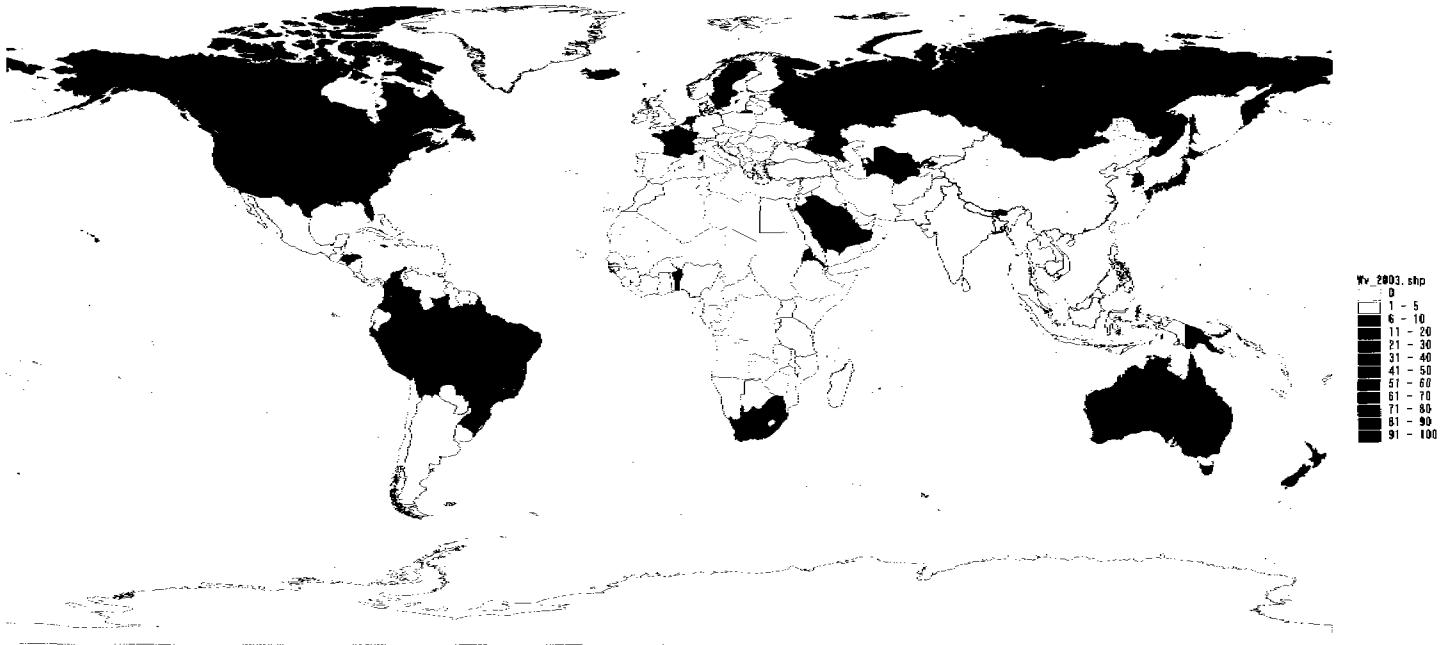
### 3) Observations

It is considered that the following alternatives are necessary to achieve a more productive, more sustainable water supply, thus filling the food demand, which keeps increasing.

- Improvement of the agricultural market's equity and availability and support to the poor farmhouses suffering from serious water shortage and those left behind in the social progress by political and organizational reforms together with international investments.
- Research and capacity building which will contribute to producing high technology and its dissemination. Exchange of information about appropriate water, taking the environment into account and food production strategies.

## 2.11 Water and Education

## Water, Education and Capacity Building



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Turkmenistan, Benin and Uzbekistan are indicated in the darkest red.

## 2.11 Water, Education and Capacity Building

### 2.11.1 Water, Education and Capacity Building around the World

Education is playing a prominent role in solving water issues. At the 2<sup>nd</sup> World Water Forum, participants confirmed that, in order to sustain water resources, “Water, Education and Training” (WET) was essential. Using WET as an impetus, the participating institutions -- including UNESCO, UNDP, IHE Delft, research divisions of international banks, and others -- agreed as a group that they would begin an effort to forge a new partnership on the subject of water education.

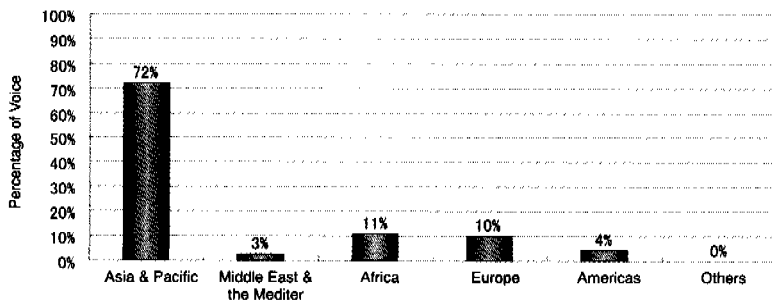
This section presents “Water Voice” about water, education and capacity building from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of for water, education and capacity building.

### 2.11.2 Water Voice from around the world that pertain to “Water, Education and Capacity Building”

#### 1) Trends of Water Voice that pertain to “Water, Education and Capacity Building”

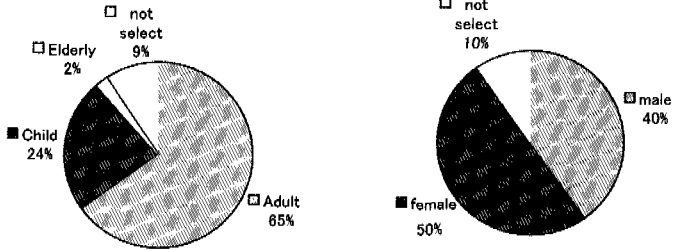
The “Water Voice” from throughout the world concerning “water, education and capacity building” have added up to 1,210 as of the end of January 2003.” Classifying these voices by region, it can be seen that Asia and Pacific (especially Asia) held the largest share, followed by Africa and Europe.

Voices from Japan accounted for 80 percent of the voices from Asia and Pacific, the region with the most voices.

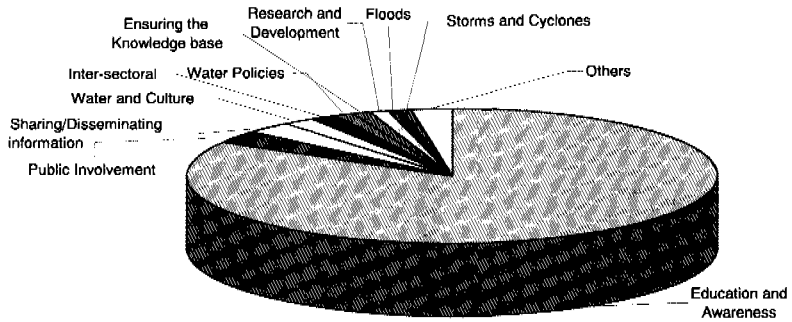


By age bracket, adults accounted for 65% of the voices, followed by children. By gender, women accounted for half of the voices.





The subcategories (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning “water, education and capacity” show that education and awareness and public involvement are associated with “water, education and capacity building.”



## 2) Listening to “Water Voice” pertaining to “Water, Education and Capacity Building”

In order to sustain precious water resources, it is necessary to coordinate effective planning at the national, regional, local, and community levels. In order to have personnel, who can manage affairs and use funds effectively, it is essential to promote human capacity building.

Next, we look at the characteristics of the actual “Water Voice” and the classifications related to “Water, Education and Capacity Building” to see that the following issues exist.

- The government and other official bodies need to promote greater public edification of matters pertaining to water resources
- Greater public awareness is needed to sustain water resources

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) The government and other official bodies need to promote greater public edification of matters pertaining to water resources

In order to educate the public at the community and resident level about the importance of water resources and the necessity of using water resources in an effective and efficient manner, it is important to increase awareness at both the government and private levels.

#### Interview with students at Bajothan high school

Bhutan is very keen about environmental education and the subject is even taken up in school classes. Since children are taught right from elementary school that the environment should have priority, the dominating thought is that development that damages the environment is not needed. The basis of this thinking is the King's environmental priority measures and his declaration that development of the country that damages the environment will be stopped. Everyone desires to keep public places clean and there is very little garbage left around. Residents and government officials are working together to clean up the nearby rivers.

Male of Bhutan (Voice ID: 102)

### (2) Greater public awareness is needed to sustain water resources

Even if greater awareness is promoted at the government and private levels, if such awareness is not promoted at the community and resident levels, effective results cannot be obtained. Only when the minds of the community and residents are enlightened, can one expect significant results.

In Malaysia, when we take out foods we use plastic bags. But, after they finish eating they toss them away. So there are many plastic bags piled up on the river. I watched a TV program once showing a study of development on resoluble plastic bags (I guess they used tapioca?). The research on this field and the education from elementary school seem to be necessary. Perhaps, we can also appeal to the public about the fact that disable people pick the trash up.

~Female of Malaysia (Voice ID: 18293)

Our society is wasting good water (drinkable) for stupid things, for example, wash the cars, water in the toilets, irrigations for useless cultivations (wineyards-grapes for wine- in California, for example). We need to educate people to use the water very carefully. It's possible to use mean water for toilets, and so on. We have to tax strongly the consume of water, but it doesn't mean to make privatization.

~Female of Brazil (Voice ID: 1818)

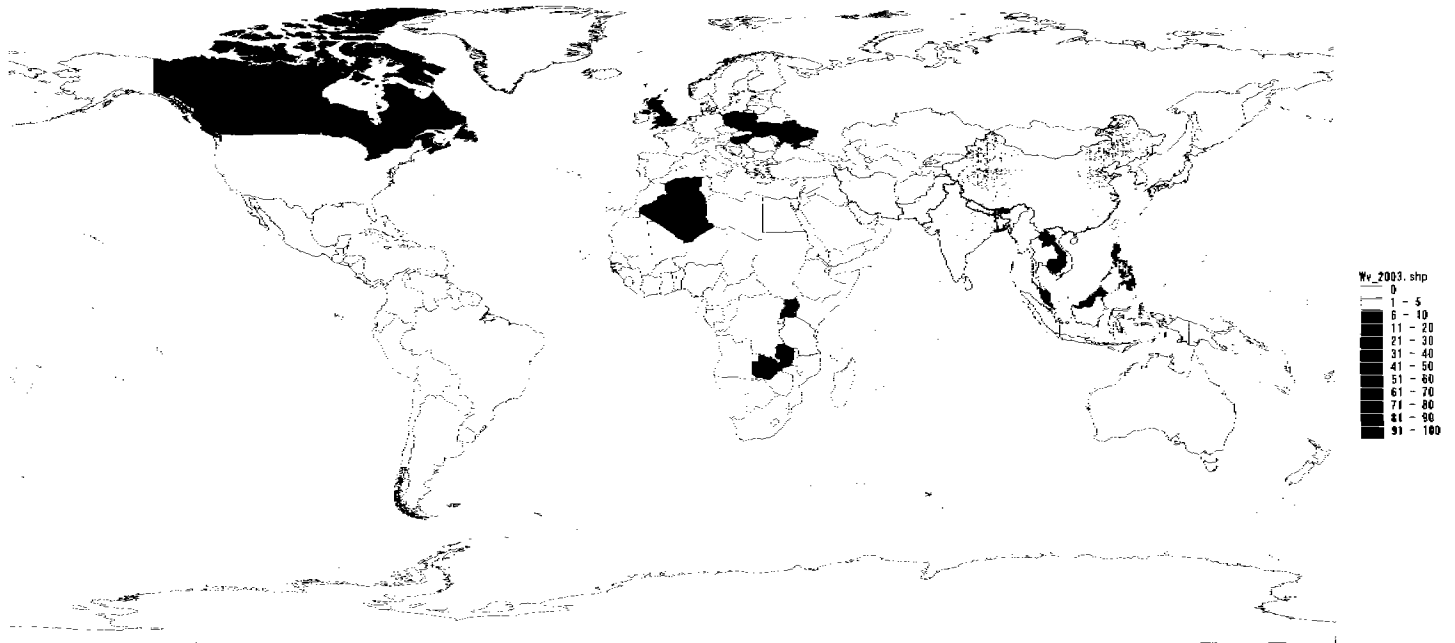
### 3) Observations

In order to deal with issues such as the ones mentioned above, it is necessary to take action such as the ones described below.

- **Human Resource Development**  
Water resource managers at every level should receive training, and should obtain appropriate knowledge sufficient to allow them to have a good basis necessary to make decisions.
- **Promotion of Public Awareness Programs**  
Global and regional action needs to be initiated to promote public awareness programs

## 2.12 Floods

# Floods



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from United Kingdom, Poland, Bhutan and Zambia are indicated in the darkest red.

## 2.12 Floods

### 2.12.1 Floods

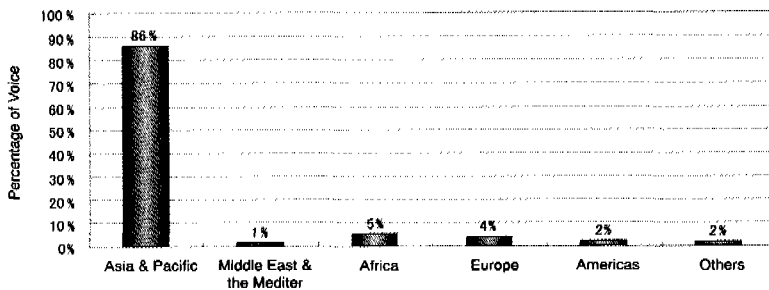
The occurrence of large floods in the world has increased in recent years. According to the International Red Cross, between 1973 and 1997, the number of global flood victims was 66 million on an annual basis. Flood victims account for the largest group of victims suffering from natural calamities, including earthquakes and droughts. Viewed in terms of annual averages of five-year periods, one can see that from 1973 to 1977, the number of flood victims was 19 million, from 1988 to 1997, there were 111 million, and from 1993 to 1997 there were 131 million - a large increase.

This section presents “Water Voice” about floods from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of floods.

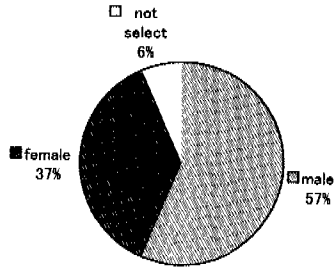
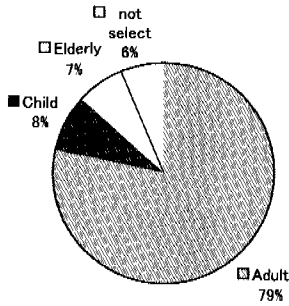
### 2.12.2 Water Voice from throughout the World Pertaining to Floods

#### 1) Trends of Water Voice pertaining to Floods

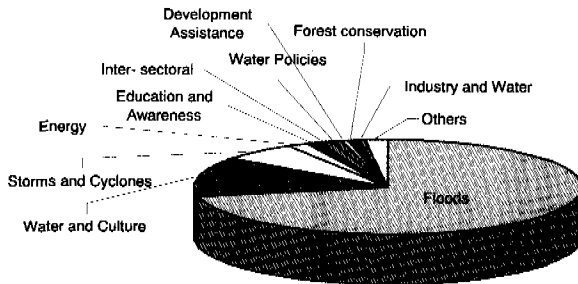
The “Water Voice” from throughout the world concerning “floods” has added up to 396 as of the end of January 2003.” Classifying these voices by region, it can be seen that Asia and Pacific (especially Asia) held the largest share, followed by Africa and Europe. Voices from Japan accounted for 40 percent of the voices from Asia and Pacific, the region with the most voices.



By age bracket, adults accounted for 80% of the voices, followed by children. By gender, men accounted for more than half of the voices.



The subcategories (47 categories<sup>1)</sup> specified by the contributors of “Water Voice” concerning “floods” show that floods, water and culture, and storms and cyclones are associated with “floods.”



## 2) A Closer Look at the Water Voice Pertaining to Floods

Floods are the most destructive kinds of the various natural calamities. Floods are vicious forms of natural phenomenon that have changed over time and that have stricken repeatedly. Flood damage is aggravated by the fact that quick flood flow in land in the upper basin is flood flow over land that has been altered for land use, by the fact that populations are accelerating rapidly, by the fact that accumulation and concentration of assets and population is occurring in dangerous areas, and by the fact that there is a reduction of drainage area caused by urbanization. In addition, it is expected that floods will increase in danger as a result of global warming, which is increasing the sea level, and as a result of the occurrence of abnormal climates.

Classification according to the floods keywords mentioned above and the characterization of the actual “Water Voice” show that there exist the following issues related to “floods.”

- Concentration of population and assets is occurring in dangerous areas in terms of flooding
- Flood damage is made worse by urbanization and promotion of development

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Concentration of population and assets in dangerous areas in terms of flooding

In the last 15 years, about 561,000 people have died in natural disasters. Only 4% of these individuals were from advanced countries. Half of the victims were flood victims, and Asia has been hardest hit. Asia is a large landmass and is home to a large number of people, most of whom live in coastal areas - areas that are dangerous in terms of flooding. In addition, earthquakes, tropical storms and cyclones occur frequently. Between 1985 and 1999, Asians accounted for 77% of the deaths and 90% of those who lost their homes. Asia also accounted for 45% of the economic damage recorded as a result of disasters.

Our village is located in the island of the Mekong River, so is very exposed to annual flooding during the wet season. Usually, the Mekong River is flooded between September and October. We have one flood within six to seven years period. In the last three years, we had continuous floods that destroyed our agricultural crops especially rice crop, leading villagers to have a severe food shortage and increasing poverty. After flooding, the villagers began to plant their rice crop and vegetable to support their livelihood, but in that time we did not have enough water, and the soil fertility dropped. This problem occurred, because the river water is very far from the field (due to increasing sand in the river) and flood washed out the soil nutrients from the rice field. Some villagers go fishing but in the river there are scarce fish also, they could not catch more fish to sell for buying their food.

~Female of Cambodia (Voice ID: 10194)



Natural disasters often bring the greatest amount of damage to those in poverty, who have the least amount of financial security.

After several consecutive years of poor rice harvests due to the droughts and floods, an impending severe drought in the countryside this year could force more villagers to migrate illegally to Thailand to seek jobs. Already, most of the young men are beginning to go to Thailand to work in the sweatshops or cassava or sugar plantation, but they could earn an average of \$2 per day, which is only a half of the wage that Thai workers normally command. Life for Cambodian migrants in Thailand is not easy.

~Elderly female from Cambodia (Voice ID: 10209)

Even in Europe - a region in the world with relatively few floods - unusual downpours occurred, making the flood issue a global issue.

The problem that has grown serious all over the world is the water problem. In some areas people suffer from lack of water, and other places they suffer from floods. In Poland (like other European countries), we've been suffering from floods for last several years. Therefore, it is important to strengthen existing flood embankments while building new ones. And it shouldn't be a matter of money - otherwise rehabilitation from flood damage will cost much, much more...

~Female of Poland (Voice ID: 13808)

## (2) Flood damage made worse by urbanization and promotion of development

In the 20<sup>th</sup> century, "man-made environments" increased at an explosive pace. This means that now any additional increases in economic and man-made activities are dangerous.

When people migrate to cities and coastal areas, they increasingly become much weaker in their ability to deal with various kinds natural disasters.

Inundation frequently occurs after heavy rains and causes heavy traffic jams and damages every year in Hanoi City. Meanwhile, people prefer to spend time near water edges as recreation space, the people therefore want to maintain the water level of the lakes in the city as high as possible, which causes floods repeatedly.

~A citizen of Vietnam (Voice ID: 14441)

As Golestan Province in Iran is the flood area and recently many flood happened and many people become homeless. Therefore I think problem is existed because of non-availability of correct data in Iran. The rainy season make this problem. On the other hands cutting of natural vegetation and trees and Jungle in this area increase the flood problem. No one comes to investigate and ask why these trees and natural vegetation are cut?

~Male of Iran (Voice ID: 9355)

Flood has become the major problem in our place. Many drainage manholes are not functioning because of the waste that got into it. Garbage collectors: they seldom appear to prevent collecting of garbage should be twice a day (morning and night). All the manholes that are not functioning must be replace and maintain proper cleaning.

~Male of the Philippines (Voice ID: 9257)

### 3) Observations

In order to deal with issues such as the ones mentioned above, it is necessary to take action such as the ones described below.

➤ **Data collection and information exchange**

In terms of data collection and the sharing of information, improvements need to be made between meteorologists and hydrologists, between states and between government and regional society. Also, it is necessary to improve the warning system to citizens so that they can be warned in the early stages of any impending disaster.

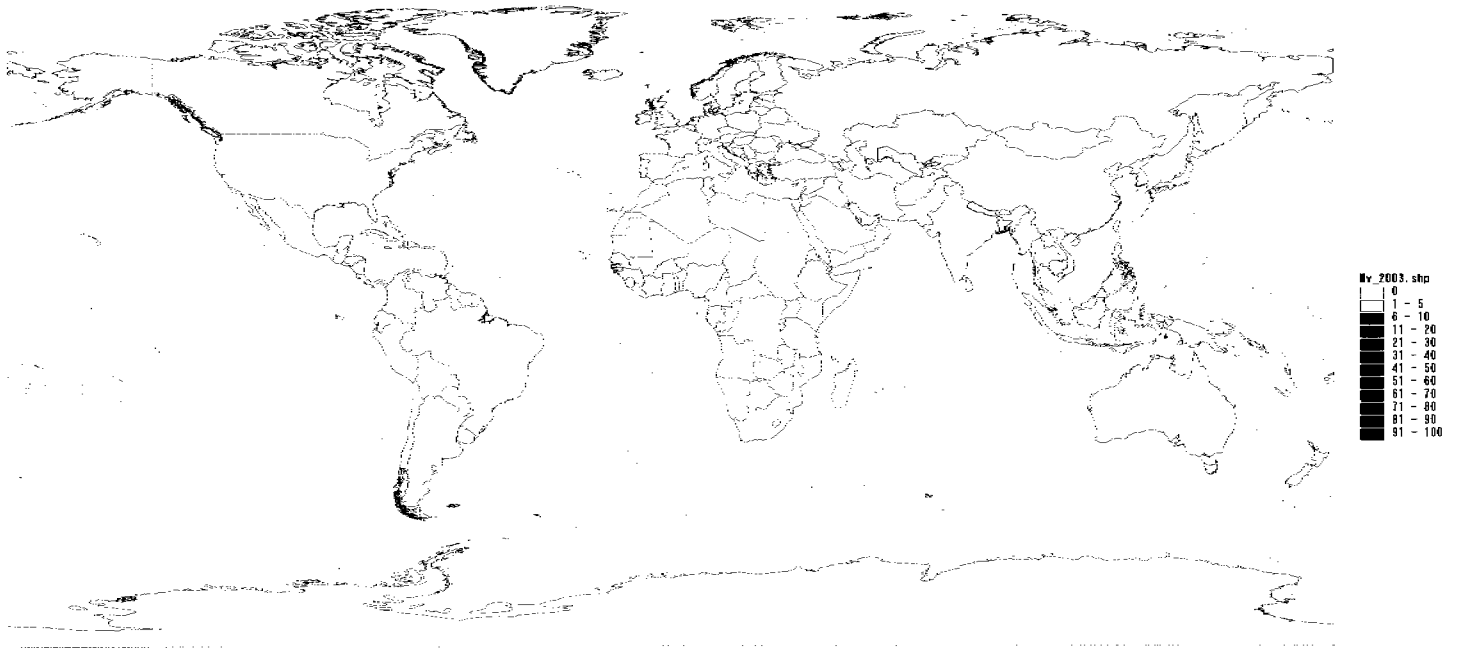
➤ **Disaster Preparation**

Disaster risk can be avoided with disaster preparation. Disaster preparation should be considered an essential component of overall water management, and vacant land plans and land use plans need to be made that consider the relationship with the ecosystem.



## 2.13 Water and Energy

## Water and Energy



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Uzbekistan, Nepal and Bangladesh are indicated in the darkest red.

## 2.13 Water and Energy

### 2.13.1 Water and Energy

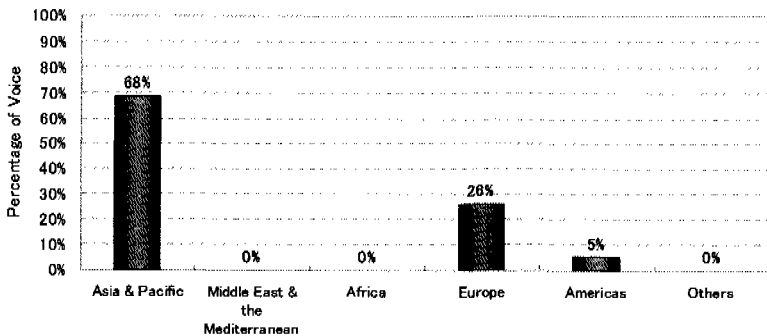
In the 21<sup>st</sup> century in which we live, we are consuming record amounts of water and energy, thanks to population growth, urban development, and economic growth. If humankind does not improve the way it plans, develops, and manages policies towards energy and water, serious consequences await it.

This section presents “Water Voice” about water and energy from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of water and energy.

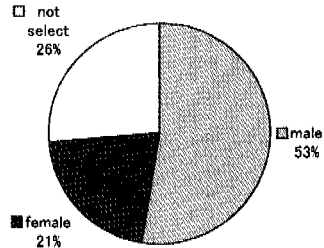
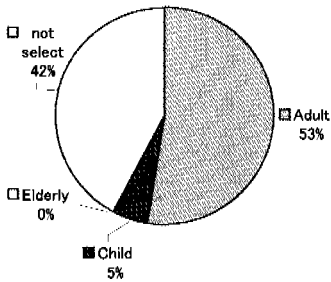
### 2.13.2 Water Voice from around the world that pertain to “Water and Energy”

#### 1) Trends of Water Voice that pertain to “Water and Energy”

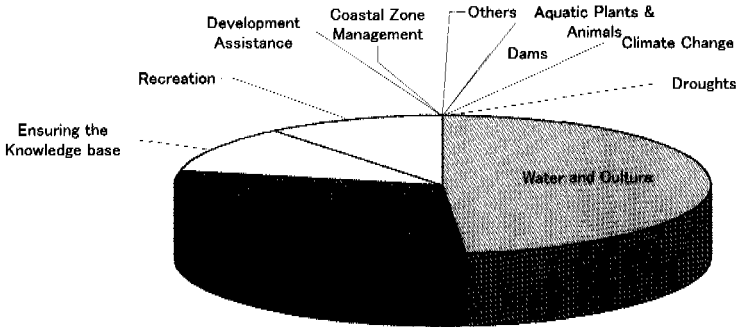
The “Water Voice” from throughout the world concerning “water and energy” have added up to 19 as of the end of January 2003.” Classifying these voices by region, it can be seen that Asia and Pacific (especially Asia) held the largest share, followed by Europe. Voices from Japan accounted for 60 percent of the voices from Asia and Pacific, the region with the most voices.



By age bracket, adults accounted for 50% of the voices, followed by children. By gender, men accounted for more than half of the voices.



The subcategories (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning “water and energy” show that water and energy, energy, and ensuring the knowledge base are associated with “water and energy.”



## 2) Listening to “Water Voice” that Pertain to “Water and Energy”

Thermal energy accounts for 80% of our energy needs today. Since thermal energy resources have a significant impact on the environment, emphasis needs to be placed on policies that rely on the development of renewable sources of energy.

Classification according to the water and energy keywords mentioned above and the characterization of the actual “Water Voice” show that the links between “water and energy” include the following problems.

- The role of hydro power as a clean and sustainable form of energy
- The impact of hydroelectric dams on the environment and on the lifestyles of residents

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) The role of hydro power as a clean and sustainable form of energy

An energy source is needed to serve as the driving force in any society that wants to continue developing. Hydro power can play an important role as a sustainable source of energy that takes the environment into consideration.

Every day, we use electricity for granted. In developed countries hydropower plants are developed and people economic grew with the favor of dams. However, 82% (19 million) of Nepal citizens are living with firewoods and lamps. There is abundant water running down the river of Nepal. How about stop wasting these resources and build hydropower plant with consideration of natural environment.

~Male of Nepal (Voice ID: 13651)

### (2) The impact of hydroelectric dams on the environment and on the lifestyles of residents

Dam construction is a requirement for hydroelectric power. Dams have a big impact on the ecosystems of rivers and river basins and also have a social impact, in terms of causing the migration of large numbers of people.

Hydropower stations have been built to provide electricity in an environmentally friendly manner and reduce floods in lower regions. Still, larger hydropower stations affect negatively by their own existence; residents have to move away from lake regions because they are faced with the threat of sliding down of riverside banks, etc. To avoid these negative effects, the Government should do more to ensure that hydropower stations really bring about happiness to people's life.

~Male from Nepal (Voice ID: 13651)



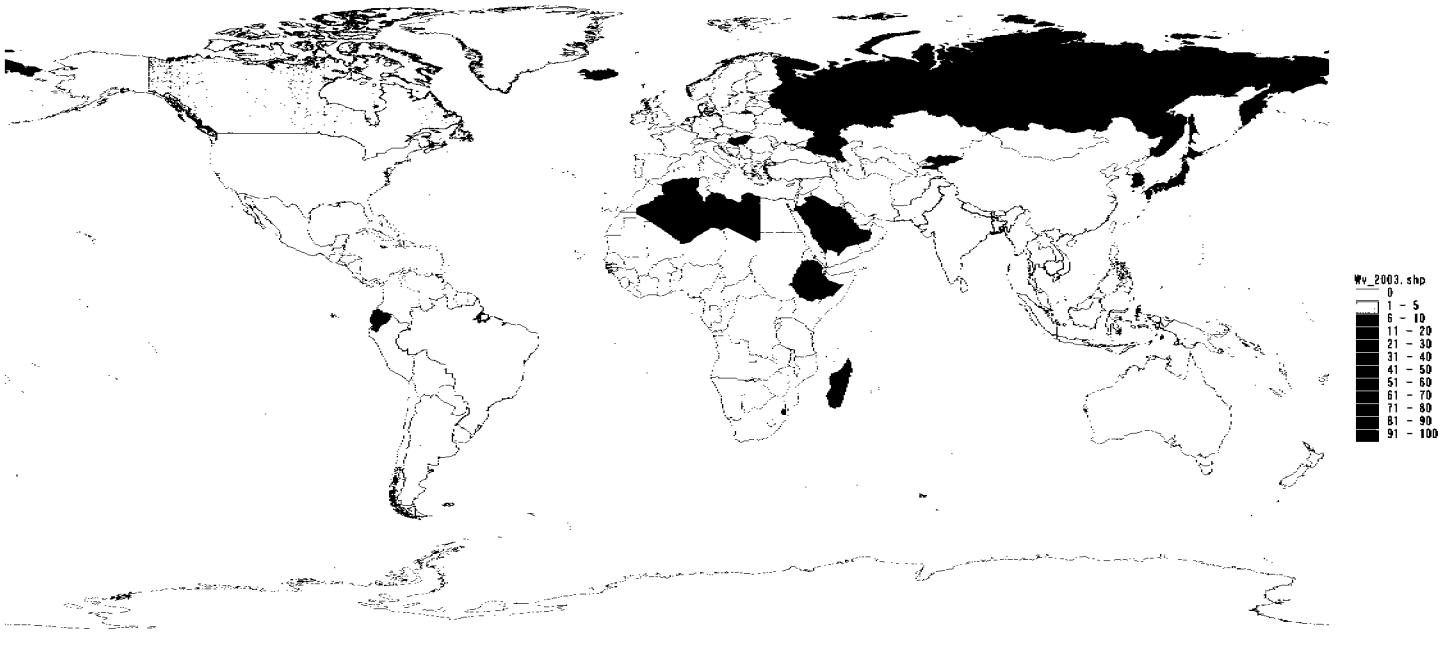
### 3) Observations

To address the above-mentioned problems, the following measures are considered necessary.

- Advancement of sustainable forms of power generation and debate related to its practicality
- Advancement of debate related to consolidation of hydroelectric power generation for the purpose of efficient dam management

## 2.14 Water and Culture Diversity

## Water and Culture Diversity



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Bangladesh, Saudi Arabia, Kyrgyz and Ethiopia are indicated in the darkest red.

## 2.14 Water and Culture Diversity

### 2.14.1 Water and Culture Diversity

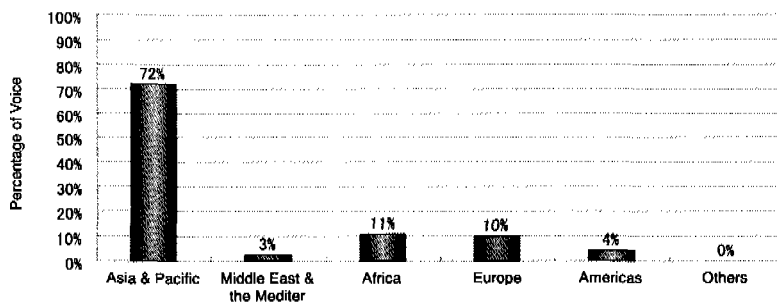
Humankind has managed water since ancient times. Vestiges of water management can be found in various cultures, sometimes in very apparent forms and sometimes very obscurely.

This section presents “Water Voice” about water and culture from throughout the world, which will facilitate understanding of the actual situation and pressing needs concerning water issues for solving the problem of water and culture.

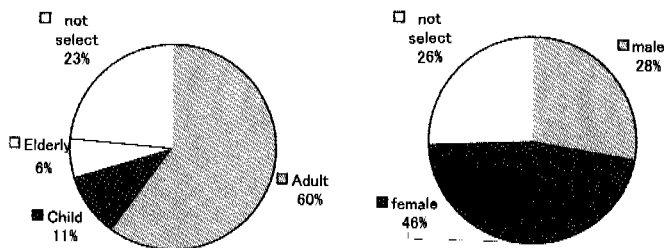
### 2.14.2 Water Voice pertaining to “Water and Culture Diversity” from around the world

#### 1) Trends of Water Voice pertaining to “Water and Culture Diversity”

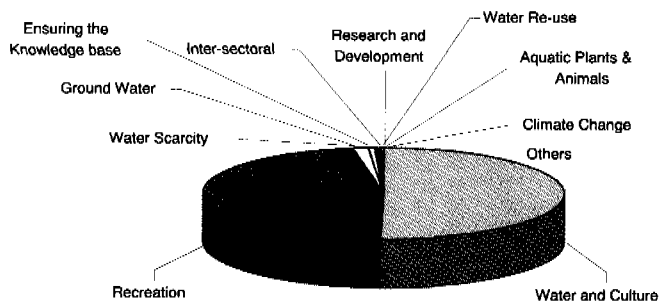
The “Water Voice” from throughout the world concerning “Water and Culture Diversity” have added up to 1,057 as of the end of January 2003. Classifying these voices by region, it can be seen that Asia and Pacific (especially Asia) held the largest share, followed by Africa and Europe. Voices from Japan accounted for 90 percent of the voices from Asia and Pacific, the region with the most voices.



By age bracket, adults accounted for 60% of the voices, followed by children. By gender, women accounted for about half of the voices.



The subcategories (47 categories<sup>1)</sup>) specified by the contributors of “Water Voice” concerning “Water and Culture Diversity” show that water and culture and recreation are associated with “water and culture diversity.”



## 2) Listening to “Water Voice” that pertain to “Water and Culture Diversity”

Even with information, action, and technology, unless there is a cultural understanding of the relationship between humankind and water –its emotions, intellect, conscience, and spirit—one can never know what nature and society require and one can never hope to find sustainable solutions to water issues.

Classification by the water and culture keywords mentioned above and the characterization of the actual “Water Voice” show that the links between “Water and Cultural Diversity” involve the following problems.

- Existence of regionally unique water cultures
- Loss of water culture in modern society

Regarding the problems above, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Existence of regionally unique water cultures

Every country and region has a water culture that is based on local customs. One can get a glimpse of that culture in the daily lifestyles and faiths.

When I go to hot springs and to public baths I can soak my body into the big tub... but when I take a bath or shower in my little bathroom I use up so much water. I think big tubs can conserve water and they are also nice for communicating with others.

~A Japanese citizen (Voice ID: 10474)

In our country rivers are sacred. Rivers like Ganga, Yamuna, Sarswati, Narmada are called sacred and are used in worship and rituals. People take sacred bath in this river. People believe that taking bath in sacred rivers relieves them from their sins. After the death of a person his bones, ashes are merged into river waters. Thus water is related with our religious life from birth to death and therefore in India, rivers are called mother goddess and water is called deity.

~Female of India (Voice ID: 2810)

### (2) Loss of water culture in modern society

Water culture, which has been part of society since ancient times, is slowly disappearing as a result of rapid development, economic progress and urbanization.

The picturesque hill city of Shillong, the capital of Meghalaya State, North East India, has many beautiful waterfalls that leap from lofty cliffs into crystal clear pools that mirror the pine-clad hills. One such waterfall is the Elephant Falls that earns its name from its resemblance to the head of an elephant. I have many fond memories of picnics in my younger days there. The water was so pristine that we could drink straight from the stream without fear of any contamination. Today I cannot vouch for the same, as the water has become relatively dirty. Still, the place evokes nostalgic feelings of my childhood whenever I visit it.

~Male of India (Voice ID: 11488)

In my childhood, many children like swimming in Hau River (a main branch of Mekong River on Delta) and I also enjoy swimming. But since early 90's, the river's color changed gradually and now, I don't want to swim. I cannot express what is the difference but many local farmers also feel like my saying. Maybe its color turned to denser one. Farmers in Delta know well about the blessing of river water, which gives them fertile soils, and we, all of the resident at Can Tho City, love this river so much. Therefore I am worried about this changing.

~Female of Vietnam (Voice ID: 9179)

### 3) Observations

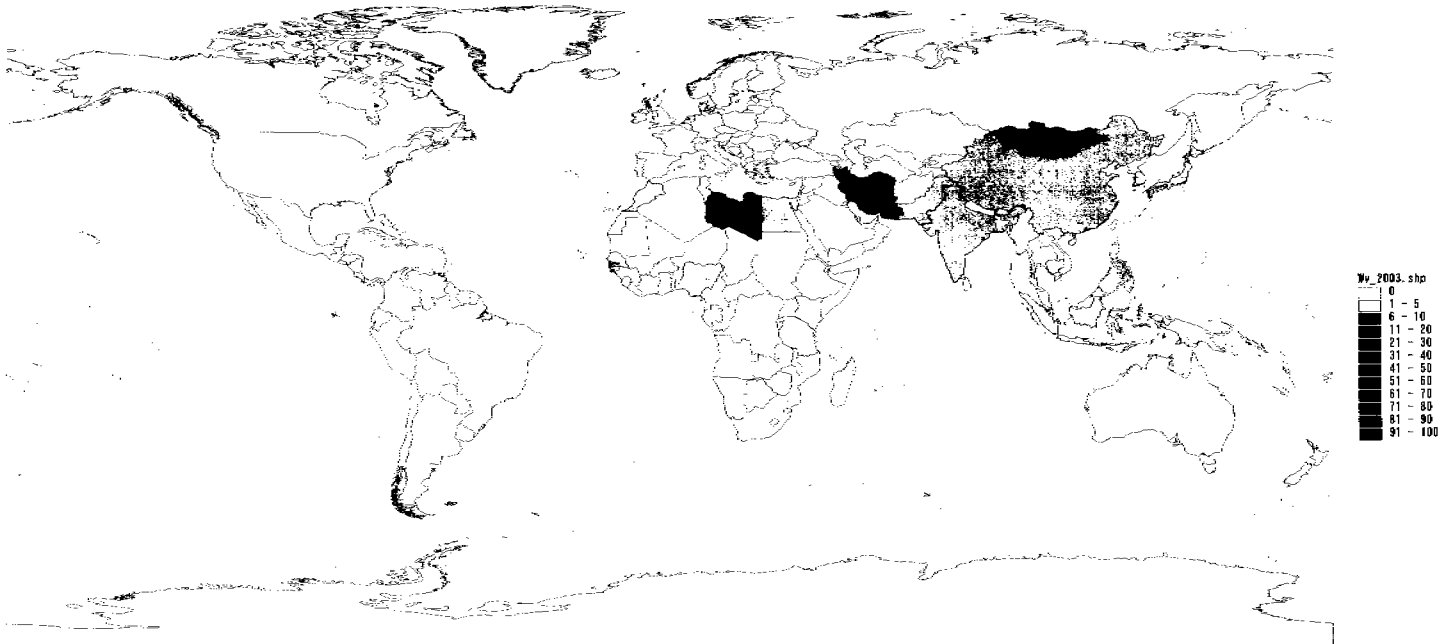
In order to deal with issues such as the ones mentioned above, it is necessary to take action such as the ones described below.

- It is important to recognize culture as a key component of water resource management, and create international opportunities to exchange knowledge related to cultures in different academic fields, sectors, and regions.
- It is important to consider "water culture" as an essential variable in the preparation of international development strategies and action plans.

## 2.15 Groundwater



# Groundwater



The portion of the number of “water voice” in each country for each theme

The largest portions of the number of “Water Voice” from Libya, Iran and Mongolia are indicated in the darkest red.

## 2.15 Groundwater

### 2.15.1 Groundwater

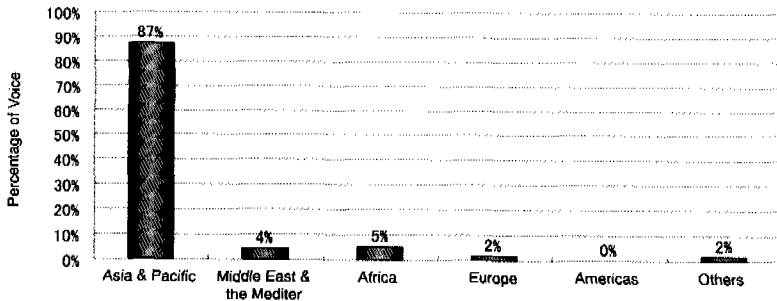
There is only a limited volume of freshwater on Earth, but people on every continent are pumping up enormous quantities of groundwater from the main aquifers, and 1.5 - 2 billion people around the world are dependent on underground water supplies. Some 600 - 700 billion m<sup>3</sup> of water, almost 20% of the quantity of water intake around the world, is used annually. However, groundwater is currently in crisis. Since people are taking in water from the main aquifers at a rate significantly faster than the rate of water recharge on almost every continent, groundwater has been depleting. In addition, water contamination is a serious problem. Scientists are finding contamination in aquifers near farms, factories and cities on every continent.

In this section, we will listen to Water Voice on “Groundwater” from around the world to deepen our understanding of their current situation of them through actual conditions of water problems and serious demands.

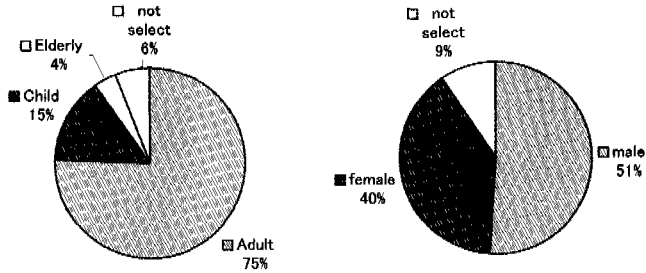
### 2.15.2 Water Voice sent from around the world in relation to “Groundwater”

#### 1) Tendencies of Water Voice related to “Groundwater”

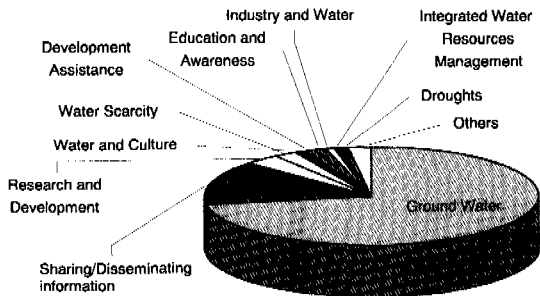
The total number of Water Voice sent from around the world in relation to “Groundwater” has reached 255 as of the end of January 2003. Categorizing by geography, the largest segment is the Asia-Pacific (mainly Asia), followed by Africa and the Middle East/Mediterranean. Moreover, almost 70% of the voices from the Asia-Pacific, which sent the largest number of Water Voice, were from Japan.



Categorizing by age, 75% of Water Voice are from adults, followed by children, and categorizing by gender, half are from males.



Next, we made classification and gathered statistics based on the sub-categories (47 categories<sup>11</sup>) which were checked by people who sent Water Voice relating to “Groundwater,” and we found that most are related to ground water, sharing/disseminating information, and research and development.



## 2) Listening to Water Voice relating to “Groundwater”

Groundwater is a necessity in many countries: It is familiar source of water for drinking, agriculture, and industry, and its development has brought huge socioeconomic profits. Almost two billion people worldwide depend on it as a source of drinking water. But along with population growth, urbanization and industrialization, and the increase in food production, the problem of groundwater supply has been escalating, as a result of which we are already suffering from such problems as groundwater depletion, contamination and salt damage, ground subsidence, and loss of damp ground. This damage has extended to the socio-economy and the environment.

Given the above categorization related to “Groundwater” by keyword and the characteristics of actual Water Voice, the following problems are believed to relate to “Groundwater.”

- Deepening problem of groundwater supply due to excess pumping.
- Contamination of groundwater

Regarding the above problems, the actual “Water Voice” are presented below for further understanding of the current situation of water problems around the world.

### (1) Tightening supply of groundwater due to excess pumping

People are taking in water from the main aquifers in almost all continents at a rate that significantly exceeds that of natural water recharge.

The soil in our village has gone dry because the groundwater has gone deeper. Water is wasted. If water goes into the ground the soil can have moisture. People use a lot of water everyday but very little of it goes back into the soil. If we collect used water in soak pits, it goes back in the soil. Rain is irregular and the earth become hot and dry. The earth has changed due to lack of water. That is why it is said that water is life, Mother earth wants water.

~Female of India (Voice ID: 2405)

In addition, ground subsidence due excess water intake has become a problem, and the ground has already sunk in some regions with high population density because of aquifer compression.

In areas such as Suzhou, Wuxi, Changzou, the ground has sunk from excessive digging for groundwater. In order to prevent further sinking of the ground, the Jiangsu Province enforced a regulation to prohibit the digging of groundwater. After the implementation of the regulative law, the ground sinking has somewhat settled.

~Male from China (Voice ID:23409)

## (2) Contamination of groundwater

Contamination of groundwater is also a serious problem. The detention period of ground water is long, averaging 1,400 years, and contaminants in aquifers accumulate steadily without draining into the sea or without becoming diluted by constant refilling with fresh new water.

In India, a high proportion of the rural population in agricultural areas obtain their domestic water supplies from shallow, private bore holes, which suffer the impact of nitrate pollution to a much greater extent than the deeper, public supply aquifers utilized for urban water supply. These deeper aquifers can also be affected by nitrate contamination although this pollution often takes much more time to percolate to these depths.

~Male of India (Voice ID: 18717)

There are several countries which conduct follow-up research on the domestic condition of aquifers, but there is no across-the-board data on a worldwide basis on trends in groundwater resources and contamination.

Korean government basically preserves underground water, and he could develop for the region having problem in supply surface water and emergency tap water. Hydrological soil maps of 22 cities and districts were made in 1999 based on the Basic Planning for Ground Water Management established in December 1996. Duraebak, the information management system, has been used since April 1998. However, the concept of public water was not introduced. The number of unreported discarded holes was the cause of underground water pollution, over one million as of 2002.

~Male of Korea (Voice ID: 22867)

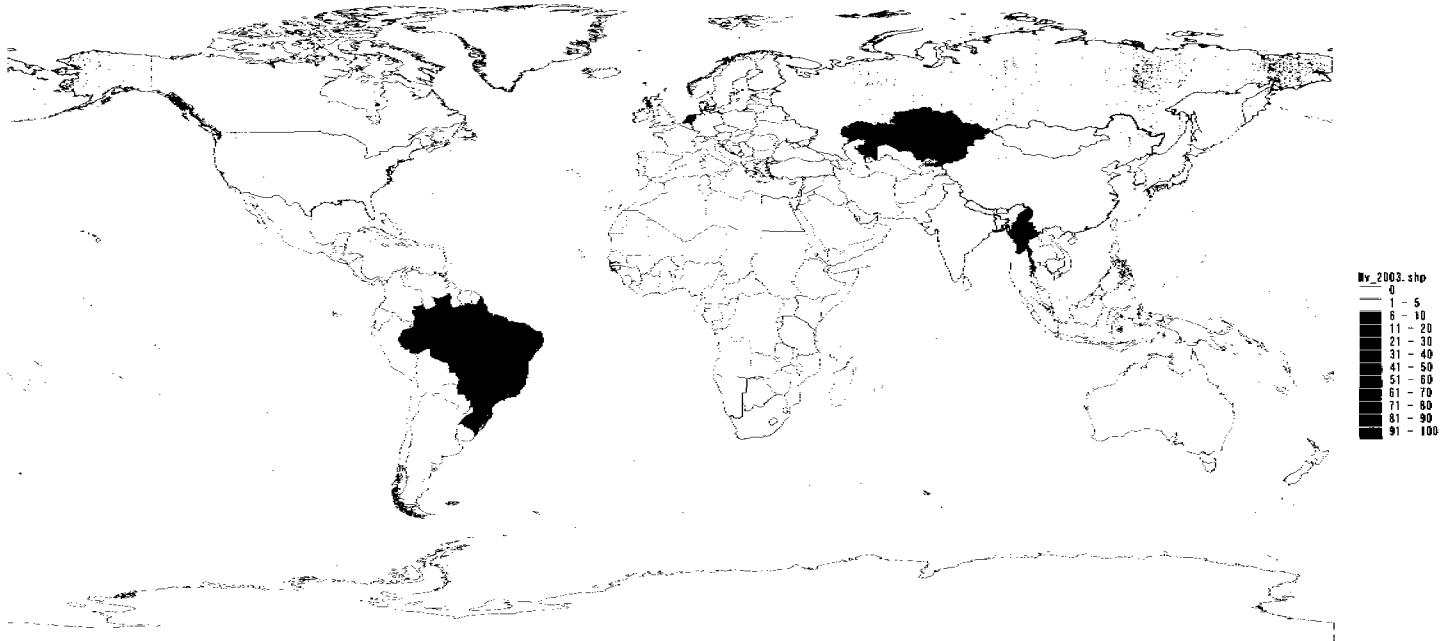
## 3) Observations

It will be necessary to take the following action to address the challenges mentioned above.

- Protection of groundwater recharging area
  - Prepare a map to specify groundwater recharge areas, investigate the characteristics of aquifers, and understand the effect on aquifers from the groundwater development, etc.
- Identifying and regulating the main contaminants of groundwater

## 2.16 Water and Information

## Water and Information



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Kazakhstan, Netherlands, Myanmar and Brazil are indicated in the darkest red.

## 2.16 Water and Information

### 2.16.1 Water and Information

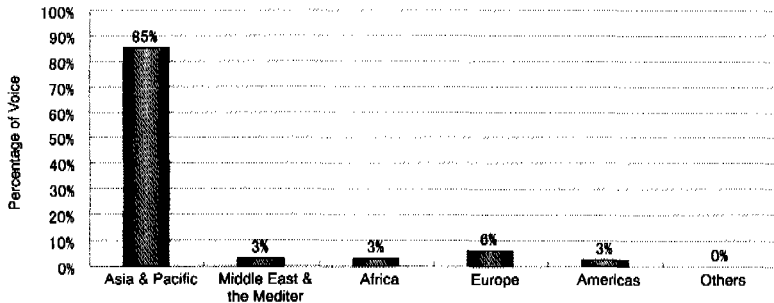
It is very important to use information technology for the purpose of effective management of water resource and to maintain the environment. In this world in which we live, there is both excess information and a shortage of information. At the time of making decisions and managing water resources, it is important to create an environment in which people can obtain the proper and necessary information.

This section listens to Water Voice related to “Water and Information,” sent from around the world, to deepen understanding of the current situation by introducing current water problems and deep desires for the purpose of solving problems on “Water and Information.”

### 2.16.2 Water Voice sent from around the world relating to “Water and Information”

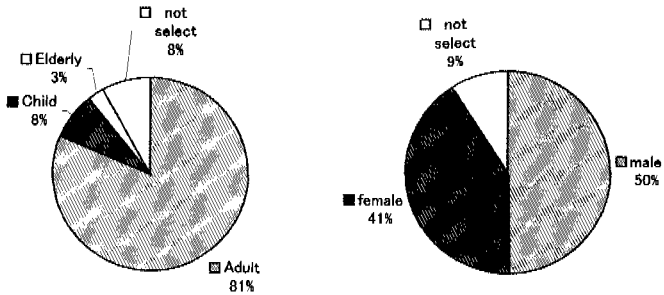
#### 1) Tendencies of Water Voice related to “Water and Information”

The number of Water Voice sent from around the world related to “Water and Information” reached 286 as of the end of January 2003. Categorizing by region, the largest number of Water Voice came from the Asia-Pacific (mainly Asia), followed by Europe. Moreover, among voices from the Asia-Pacific, almost 70% were from Japan.

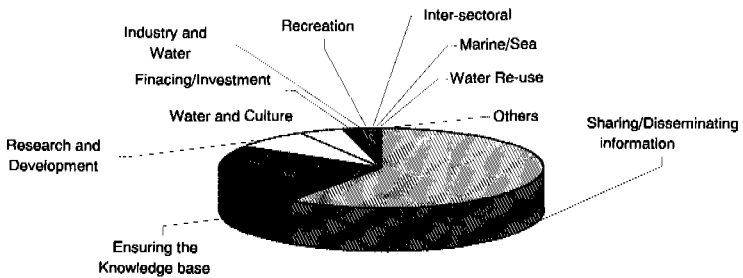


Categorizing by age, about 80% were from adults, followed by children. And categorizing by gender, voices from males accounted for 50%.





Next, we made classification and gathered statistics based on the sub-categories (47 categories<sup>11</sup>) which were checked by people who sent Water Voice relating to “Groundwater,” and we found that sharing/disseminating information on water and establishing/sharing knowledge base are related to “Water and Information.”



## 2) Listening to Water Voice related to “Water and Information”

Information on water should be evaluated comprehensively by introducing a data system for basin areas, one that is accessible to related organizations and the public, on the scale of the basin area or larger. But in fact there is a wide gap in information infrastructure levels among regions.

Considering the above categorization related to “Water and Information” by keyword and characteristics of actual Water Voice, the following problems are believed to be related to “Water” and “Information.”

- Regional differences in Water Information Infrastructure
- Utilization/Exploitation of cutting-edge technology by advanced countries

Regarding the above problems, the actual “Water Voice” is presented below for further understanding of the current situation of water problems around the world.

### (1) Regional differences in water information infrastructure

There are regions in developing countries that do not have the complete basic data on water needed for management. In such regions, it is necessary to introduce technology to collect data on water with high accuracy at an early date.

Please let me have more information on water analysis technology so that I would do more courses of water and food security.

~Male of Zimbabwe (Voice ID: 17497)

(5 years ago, in our village ( Paisalee, Nakron Sawan ), we had only a small village pond to store rain water in the rainy season so all villagers used water from this pond for daily usage. In dry season, we suffered from a shortage of water since the water in small pond was insufficient to serve all households. Currently, our lives are better since we have a bigger pond than the past and tap water has been distributed to all households already. However, for agriculture, we were still in trouble in dry season because we did not have enough rain water so beginning of July 2002, our village performed the Thai ceremony of asking for rain from the sky by going in procession with cats. We believe that this ceremony will make it rain. Fortunately, it rained. What we would like to have is a canal nearby our agricultural areas which beneath our crops.

~Female of Thailand (Voice ID: 1572)

### (2) Utilization/exploitation of leading-edge technologies by advanced countries

Along with the introduction of IT technologic, such as the Internet, advanced countries are promoting research and technology development on the exploitation of information technology in water-related fields. The effective employment of these technologic has also become a challenge.

The digital Elevation Model prepared in GIS environment is extremely useful in delineating flood-affected areas in different magnitude of floods and in different scenarios (like overtopping, unprotected rivers). The GIS database may also contain population, socio-economic, agriculture and infrastructure data, which can be used in conjunction with the flooding data an evacuation strategy, rehabilitation planning.

~Male of Holland (Voice ID: 1427)

System analysis is a method of studying the dynamics of the world around us. Nowadays, user-friendly system building tools are available to design dynamic representation of physical as well as social and economic systems. They enable the visualization and analysis of object interactions among the various components of natural and water resource systems.

~Female of Holland (Voice ID: 1342)

### 3) Observations

It will be necessary to take the following action to address the challenges mentioned above.

- Advanced dissemination and exchange of information from advanced countries to developing countries
- Partnership formation using communication technology on water information data among countries, regions, and basins.

## 2.17 Financing Water Infrastructure



## 2.17 Financing Water Infrastructure

### 2.17.1 Financing Water Infrastructure

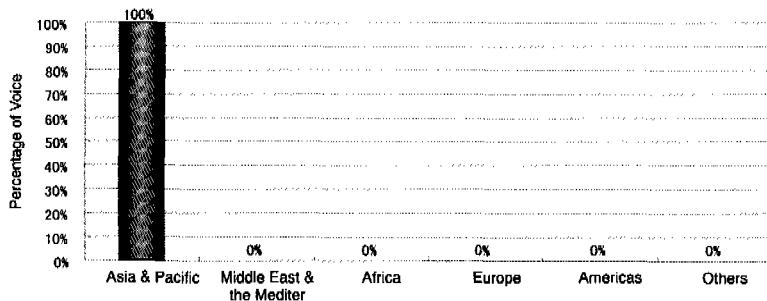
It was confirmed at the Earth Summit in 1992 that more funds are needed for the purpose of sustainable development and to eliminate poverty. Fresh water, in particular, was cited as an area requiring enormous additional finance. It was reported at the ministerial meeting in the 2<sup>nd</sup> World Water Forum that given the population increase expected in the next 25 years, we need more than 100 billion dollars annually to meet the demand for water and sanitation, in addition to the current investment of about 80 billion dollars per year.

This section listens to Water Voice related to “Financing Water Infrastructure,” sent from around the world, to deepen our understanding of the current situation by introducing the current water problems and deep desires for the purpose of solving problems in “Financing Water Infrastructure.”

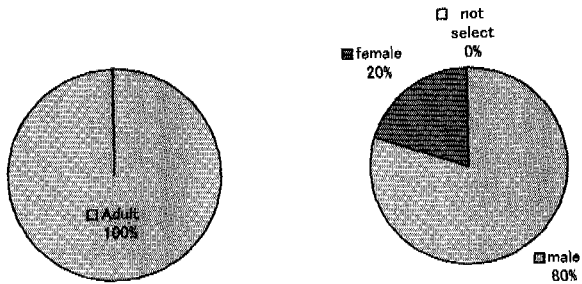
### 2.17.2 Water Voice related to “Financing Water Infrastructure” sent from around the world

#### 1) Tendencies of Water Voice related to “Financing Water Infrastructure”

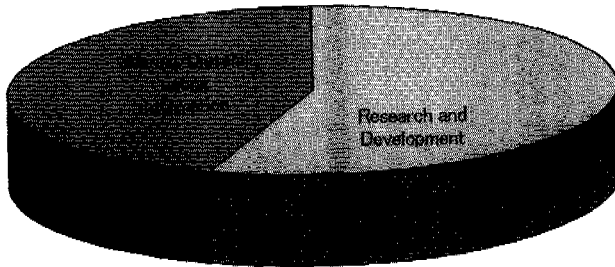
The number of Water Voice sent from around the world in relation to “Financing Water Infrastructure” reached only five as of the end of January 2003. Categorizing by region, the largest number of Water Voice came from the Asia-Pacific (all from Asia) and there were also voices from India, Thailand, and Japan.



Categorizing by age, voices from adults accounted for 100%. Categorizing by gender, voices from males accounted for 80%.



Next, we made classification and gathered statistics based on the sub-categories (47 categories<sup>1)</sup>) which were checked by people who sent Water Voice relating to “Financing Water Infrastructure,” and we found that research and development and sharing/disseminating information on water are related to “Financing Water Infrastructure.”



## 2) Listening to Water Voice related to “Financing Water Infrastructure”

The securing of financing to solve water problems has been a long-term challenge not only for developing countries but also for advanced countries looking to provide support to the former. In addition, it is difficult to estimate the cost of water infrastructure not in use currently because they include a broad range of facilities and there is no reliable way of taking statistics.

Considering the above categorization related to “Financing Water Infrastructure” by keyword and the characteristics of actual Water Voice, the following problems are assumed to be related to “Financing Water Infrastructure.”

- In every region in the world, people have been concerned about the financial sustainability (including the capability to respond to investment needs and to developing a method to calculate charges covering all costs) of water resource management organizations and service providers.

Listening to the actual Water Voice related to the above problems helps you identify the current state of water problems in the world.

A recent study emphasizes that the ability of localities to pay for new water is closely tied to the way they charge for the old; the more they give their water away, the more difficulty they will have in financing new development. This is even more the case with wastewater treatment, for which most utilities have failed to adjust rates adequately to compensate for the recent decline in federal subsidies. One expert observed in 1983 that heavy reliance on relatively unpredictable subsidies exposes the utility future managerial and financial crisis.

~Male of India (Voice ID:19582)

## 3) Observations

It will be necessary to take the following action to address the challenges mentioned above.

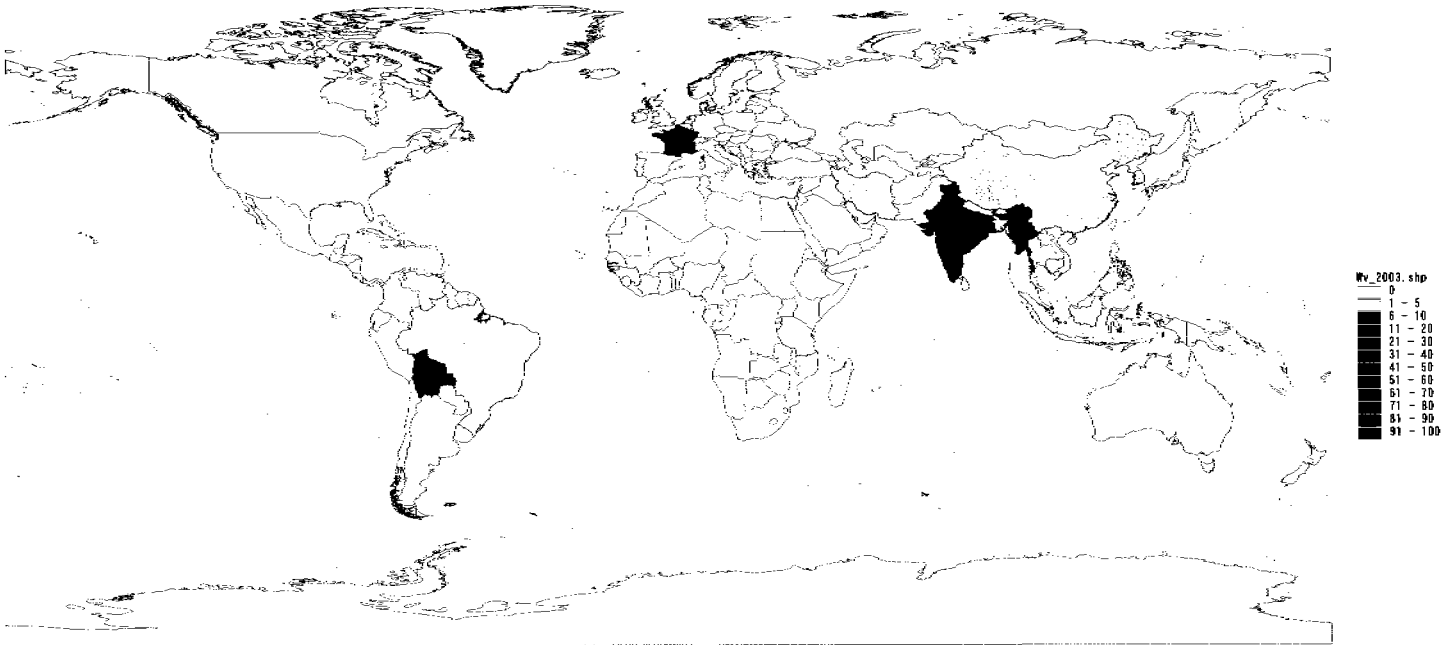
- *Effective use of investment fund in the private sector*  
To minimize the development risk by public organizations, local companies, and foreign companies, it is necessary to have good communications, accountability, involvement of stakeholders, and effective local management. If these are realized, local private companies will be more interested. Since local private companies are less concerned about taking risks, they will be better than international companies as a source of financing for investment.





## **2.18 Science, Technology and Management Panel**

## Science, Technology and Management Panel



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Bolivia, India and Myanmar are indicated in the darkest red.

## 2.18 Science, Technology and Management Panel

### 2.18.1 Science, Technology, and Management Panel

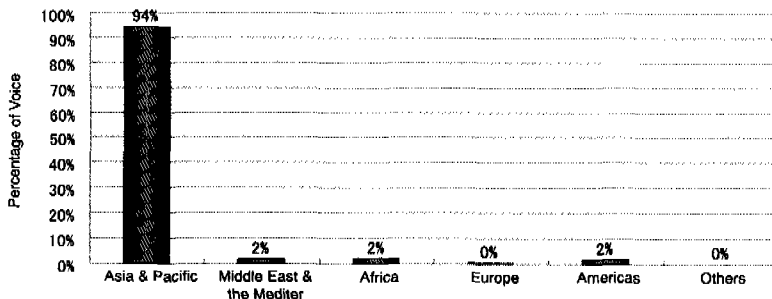
Water problems on a global scale include factors such as population growth, which is expected to continue in the future, rapidly advancing urbanization, and fluctuations in climate, in addition to deepening problems of resource shortage. It is necessary to have proper strategies for continually satisfying demand food, water and sanitation now and in the future. This in turn demands innovation in investment management and science, technology and management.

This section presents “Water Voice” about “Science, Technology and Management” from throughout the world, which will deepen understanding of the actual situations and pressing needs concerning water issues for solving problems of science and technology.

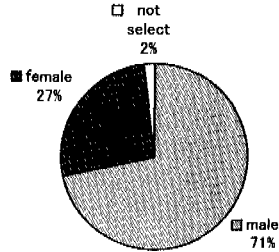
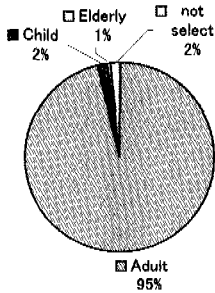
### 2.18.2 Water Voice related to “Science, Technology and Management” sent from around the world

#### 1) Tendencies of Water Voice related to “Science, Technology and Management”

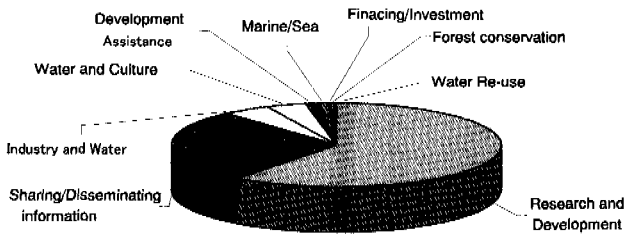
The number of Water Voice sent from around the world in relation to “Financing Water Infrastructure” reached 260 as of the end of January 2003. Categorizing by region, Water Voice from the Asia-Pacific (all from Asia) accounted for most voices. And within the Asia-Pacific, those from India accounted for 80%.



Categorizing by age, Water Voice from adults accounted for 95%. Categorizing by gender, those from males accounted for about 70%.



Next, we made classification and gathered statistics based on the sub-categories (47 categories<sup>11</sup>) which were checked by people who sent Water Voice relating to “Science, Technology and Management,” and we found that research and development and sharing/disseminating information on water are related to “Science, Technology and Management.”



## 2) Listening to Water Voice related to “Science, Technology and Management”

Introducing measures related to water resource assumes a correct understanding of the related science, and these measures depend on the technologies used.

Considering the above categorization related to “Science, Technology and Management” by keyword and the characteristics of actual Water Voice, the following problems can be assumed to be related to “Science, Technology and Management.”

- Research and development activities on water require a strategic analysis of the extremely diversified needs of many countries so that it is necessary to consider and build expertise specific to the region.

Listening to actual Water Voice related to the above problem helps identify the current state of water problems in the world.

I came to understand that the Nile River supports the lives of many people and that its water is an important industrial resource. I also realized that in order to protect our beautiful Lake Biwa from environmental pollution and natural destruction, implementation of working measures and substantive research are required.

~Male of Japan (Voice ID:2996)

Do not stand in the garden and spray the plants lightly every day. This is the worst possible way to water. When you water, water thoroughly to encourage roots to seek water and nutrients deep in the soil. With an extensive, deep root system, plants are better able to withstand dry periods. When watering, soak the soil to a depth of at least 6 to 8 inches. A thorough soaking every four or five days on light, sandy soils and every 7-10 days on heavy clay soils is a good general guide for irrigating vegetables in the absence of rainfall.

~Female of India (Voice ID:16816)

## 3) Observation

It will be necessary to take the following action to address the challenges mentioned above.

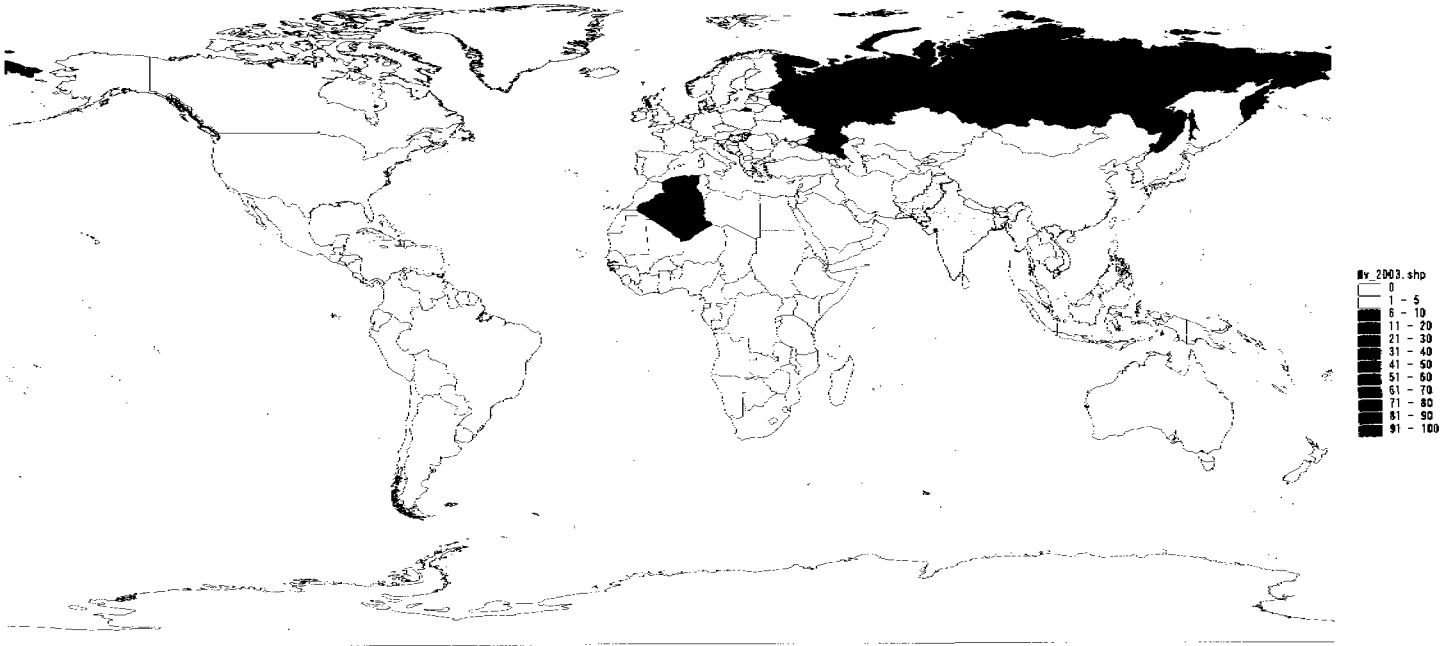
- Enhancing research and development plans on the needs of each country, promoting new technology development, and exploiting expertise specific to the region.



## **2.19 CEO (Chief Executive Officer) Panel**



## CEO Panel



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Russia and Algeria are indicated in the darkest red.

## 2.19 Chief Executive Officer Panel

### 2.19.1 Chief Executive Officer Panel

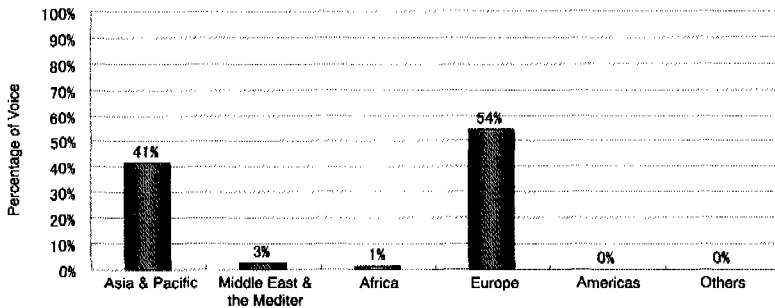
In the 2<sup>nd</sup> World Water Forum, participants submit a statement (three main themes: water supply and allocation, water utilization and maintenance of water quality, and the development of water governance organization) for the purpose of solving water problem, based on the understanding that contributions from companies are necessary. The Chief Executive Officer (CEO) Panel is an activity to work on solving water problems, and currently involves CEOs from 14 international companies.

This section listens to Water Voice related to “CEOs,” sent from around the world, to deepen our understanding of the current situation by introducing current water problems and deep desires for the purpose of solving problems on the “CEOs.”

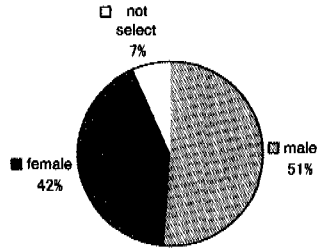
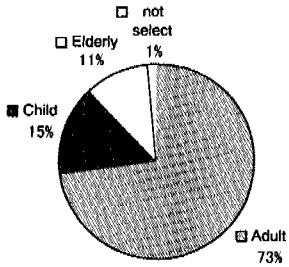
### 2.19.2 Water Voice on “CEOs” sent from around the world

#### 1) Tendencies of Water Voice related to “CEOs”

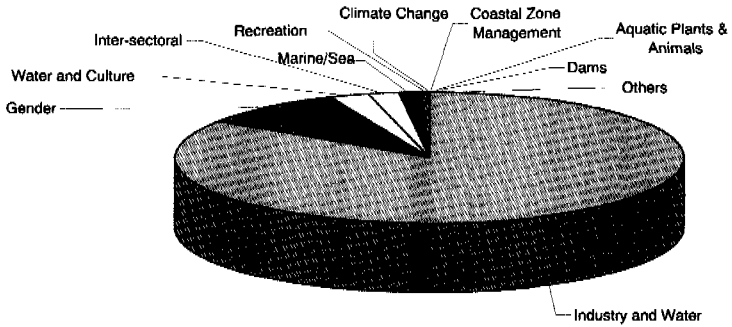
The number of Water Voice sent from around the world related to “CEOs” reached 147 as of the end of January 2003. Categorizing by region, the largest numbers of Water Voice came from Europe, followed by the Asia-Pacific region (all from Asia). And within Europe, responsible for the largest number of Water Voice, those from Russia accounted for 50%.



Categorizing by age, Water Voice from adults accounted for more than 70%, followed by children. Categorizing by gender, Water Voice from males accounted for 50%.



Next, we made classification and gathered statistics based on the sub-categories (47 categories<sup>1)</sup>) which were checked by people who sent Water Voice relating to “CEOs,” and we found that industry and water, gender, and water and culture are related to “CEOs.”



## 2) Listening to Water Voice related to CEOs

Considering the above categorization related to “CEOs” by keyword and characteristics of actual Water Voice, the following problems are assumed to relate to “CEOs.”

- Companies developing economically by using an enormous amount of water must be responsible for contributing to solving not only those water problems for which the company itself is to blame but also those on a global level.

Listening to the actual Water Voice related to the above problem helps identify the current state of water problems in the world.

There is Selenginskiy Pulp-and-Paper Mill in our region. This Mill influences negatively the condition of water objects in our republic, particularly River Selenga, which flows into the lake and directly Baikal itself. Due to the big amount of wastes water of the lake and rivers have become very turbid. That is why we should take urgent measures to prevent such a crying chaos.

~Male of Russia (Voice ID:17793)

The Oigawa River in my neighborhood is very wide. However there is little water. I heard water goes to the sea through the pipe in order to generate electricity. It might be necessary in the era of high economic growth. However too little water is a problem. The electricity makes our life convenient. The relationship between human beings and environment is a difficult problem.

~Male of Japan (Voice ID:9623)

Food manufacturers that produce our essential daily food. Companies most certainly take proper measures for their sewage disposal. This is an area relatively unknown to the general people. I wish that information disclosure on sewage disposal be made more public so that people can develop an understanding.

~Male of Japan (Voice ID:3404)

## 3) Observation

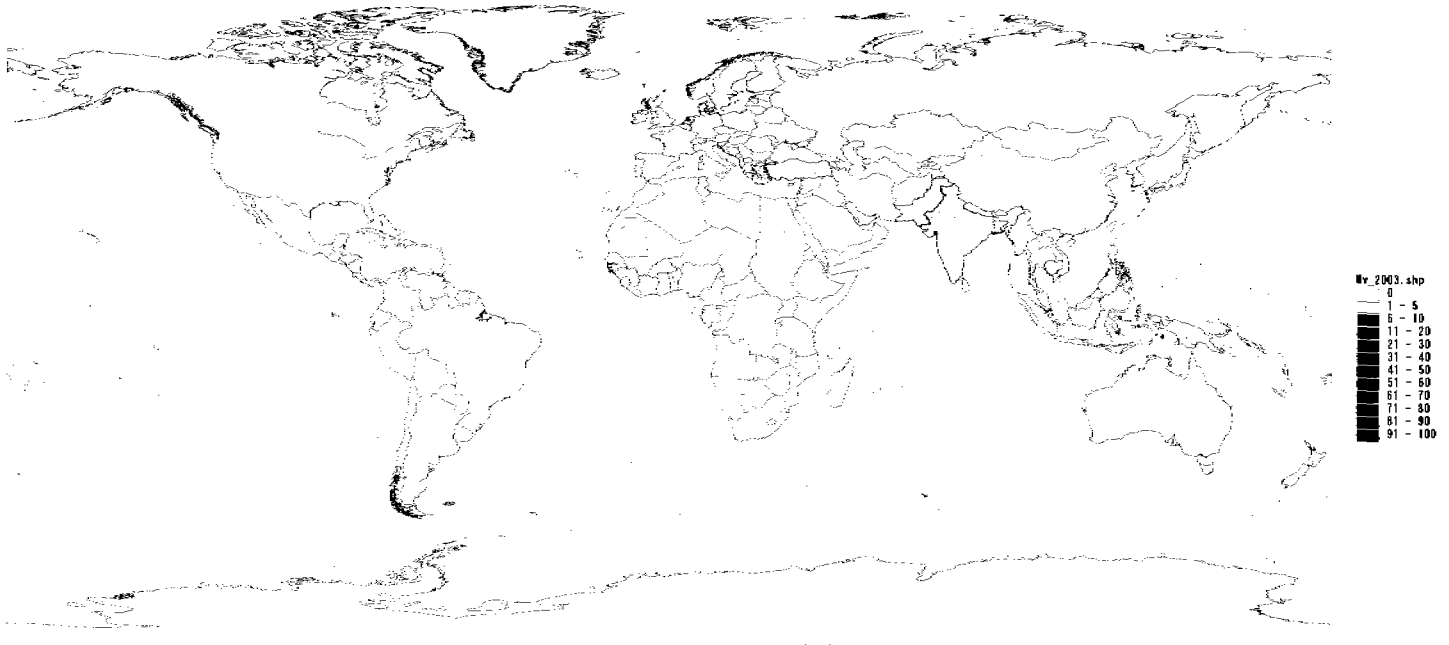
It will be necessary to take the following action to address the challenges mentioned above.

- Submitting a joint statement on further practice and the commitment and promotion of dialogues with stakeholders.



## 2.20 Gender Panel

## Gender Panel



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Turkey, Pakistan, India and Nepal are indicated in the darkest red.

## 2.20 Gender Panel

### 2.20.1 Gender Panel

Governments are calling for related organizations to become involved in policy and decision making processes to promote the participation of all stakeholders at the country, region, and international levels. Men and women have different opinions about the use of water. It also often happens that the relationships between them are unbalanced. "Effective development" means recognizing these facts.

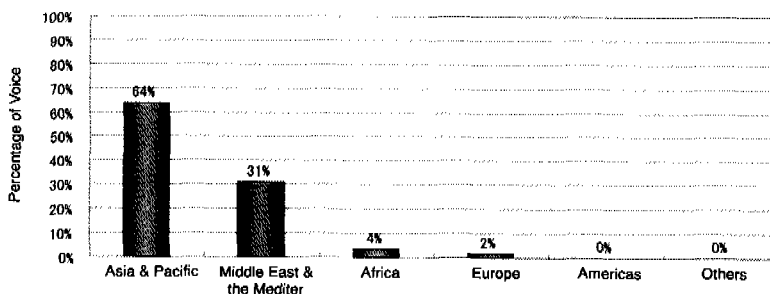
For example, women and the poor, in general, are rarely given opportunities to benefit from development and governance. Given this, it is necessary to effectively use human resources and institutional reform to allocate burdens, profits, and responsibilities logically and equally between women and men.

This section presents "Water Voice" about "Gender" from throughout the world, which will deepen understanding of the actual situations and pressing needs concerning water issues for solving gender-related problems.

### 2.20.2 Water Voice sent from around the world relating to "Gender"

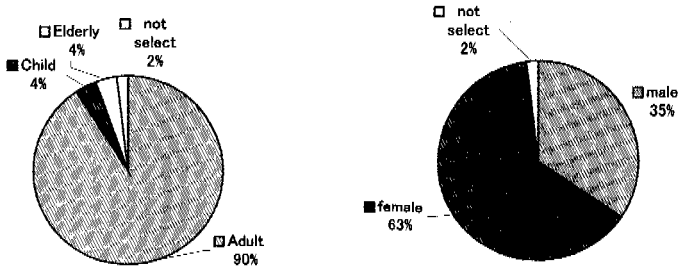
#### 1) Tendencies of Water Voice related to "Gender"

The number of Water Voice sent from around the world in relation to "Gender" reached 55 as of the end of January 2003. By region, the largest numbers of Water Voice came from the Asia-Pacific region, followed by Middle East & the Mediterranean (all from Asia). Within the Asia-Pacific region, responsible for the largest number of Water Voice, those from India and Turkey accounted for 50%.

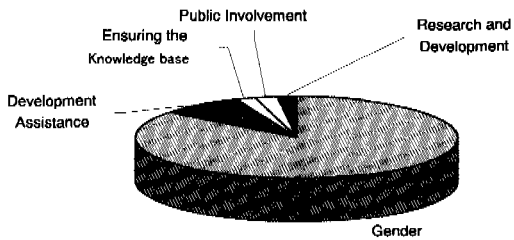


Categorizing by age, Water Voice from adults accounted for 90%. Categorizing by gender, Water Voice from females accounted for more than 60%.





Next, we made classifications and gathered statistics based on the sub-categories (47 categories <sup>11</sup>) which were checked by people who sent Water Voice relating to “Gender,” and we found that *gender, development assistance on water and establishing/sharing knowledge base* are related to “Gender.”



## 2) Listening to Water Voice related to “Gender”

Since the status of females is generally low in developing countries, it is still difficult to grasp the reality and the actual status of female issues associated with water problems.

Considering the above categorization related to “Gender” by keywords and characteristics of actual Water Voice, we assume that the following problems are related to “Gender.”

- The poor are at a disadvantage when it comes to benefiting from an improvement in water supply and sewerage systems, and poor females, in particular, are left in an unfair situation.
- Females are not offered opportunities to participate in the supply, management, and protection of water.

Listening to the actual Water Voice related to the above problem helps identify the current state of water problems in the world.

### (1) Poverty and Gender

In many societies, there are divisions of labor between males and females. And females are given the jobs of pumping and storing water, caring for children and the sick, cooking, cleaning, and sanitary and hygiene tasks.

We are a Seasonal Worker family. We spend three months of the year by working in fields and living at the tent. We work in field for eight hours a day. After working, we have to carry drinking water two or three hours a day. According to our culture carrying water is women’s job. While men are drinking tea and taking rest, we carry water and cook. After a weary day, instead of carrying water, I want make time for my children and myself.

~Female of Turkey (Voice ID:1189)

In many local areas, women are assigned the role of taking a long walk over difficult terrain to fetch water, and sometimes girls help their mothers do the work. So women pump the water and lose the chance to focus on study, which offers the opportunity to improve their living conditions.

I am the director of Mardin / Evren CATOM (Multi Purpose Community Center). We have been trying to educate young girls and women about reading writing, health, motherhood etc. But they are not able to take these classes all the time as they are carrying water from the fountain and they are being late to come to our center. I have talked with the municipality about this problem. They said that their budget is not enough to bring drinking pipeline to our squatter area. They told that they could only supply vehicle support. So our women and young girls still are not able to take classes regularly.

~Male of Turkey (Voice ID:1623)

However, if water supply and sewerage systems and irrigation facilities at a certain level are completed, the quality of life for poor women and their families will improve significantly.

We are an agrarian worker family. My father cannot work, as he is old. My mother, my three sisters and I have been working in agricultural areas collecting cotton. After Harran plain was irrigated, cotton was grown by farmers and textile factories were opened. The water brought job opportunities to our province. In our traditions, women cannot work anywhere except agricultural areas. After the water, the women began to work in the textile factories to earn money. Earning money increased the status of women in the society.

~Female of Turkey (Voice ID:1115)

## (2) Females' participation to water governance

Although females are responsible for most unpaid labor, such as pumping water, they cannot participate in the decision making on water supply and governance in the current condition.

Discuss with women and men how work and decisions in water supply and sanitation are divided. Asked about who decides, both men and women usually say the men. Discussing the process often reveals that both sexes play a role. Both groups also often come to their (own) conclusion that women do much of the work, but are not much involved in decisions. This provides a good basis for discussing implications and change.

Female of India (Voice ID:19015)

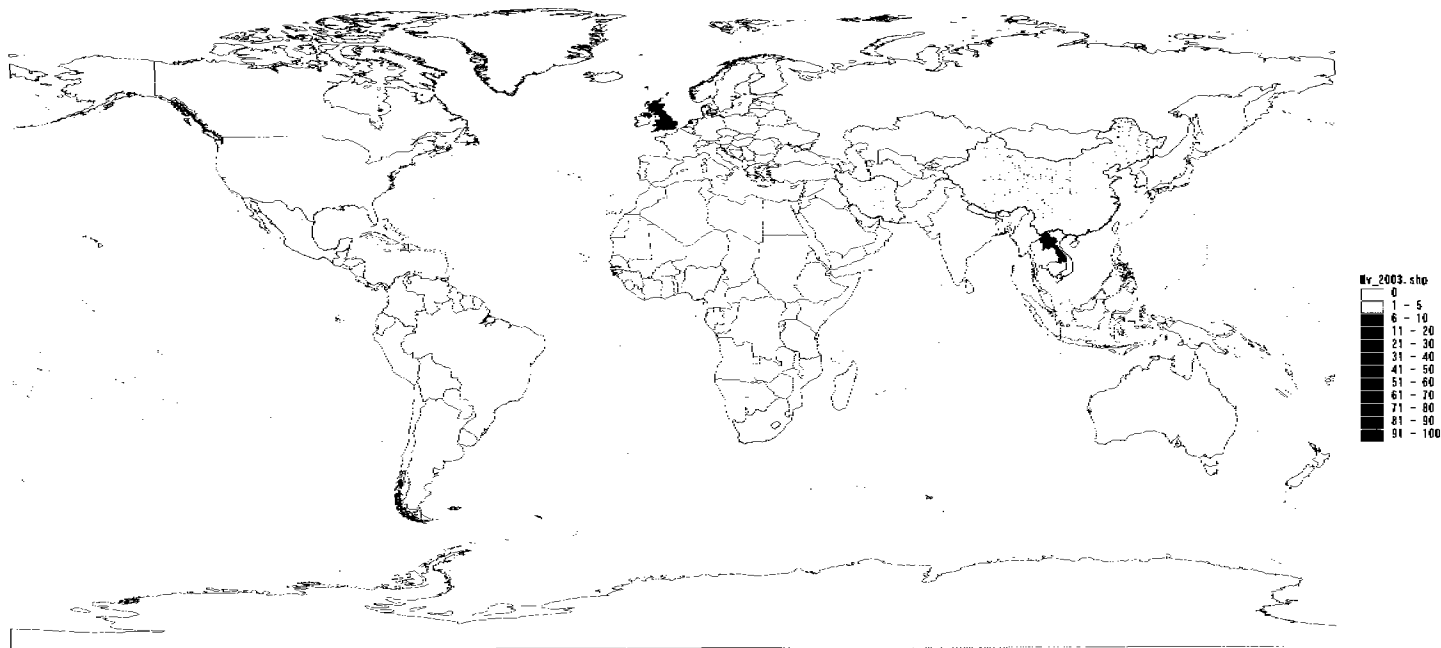
## 3) Observations

It will be necessary to take the following action to address the challenges mentioned above.

- Creating opportunities for females to study or get a job by completing water supply and sewerage systems
- Establishing systematic organization: It is necessary to have females participate in planning and managing land and water, based on complete information sharing, because they represent the economic, environmental, and social interests of local societies.

## 2.21 Water Development Partners Panel

## Water Development Partners Panel



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from United Kingdom and Laos are indicated in the darkest red.

## 2.21 Water Development Partners Panel

### 2.21.1 Water development partners panel

Some of the organizations that participated in the kickoff meeting for the Third World Water Forum held in June 2001 discussed a policy to promote a dialog between development partners and relevant ministers. This resulted in a proposal for a “Water Development Partners Panel” involving the heads of international development financing institutions and ministers in charge of development or water resources.

This section presents “Water Voice” about Water Development Partners from throughout the world, which will deepen understanding of the actual situations and pressing needs concerning water issues for solving this and related problems.

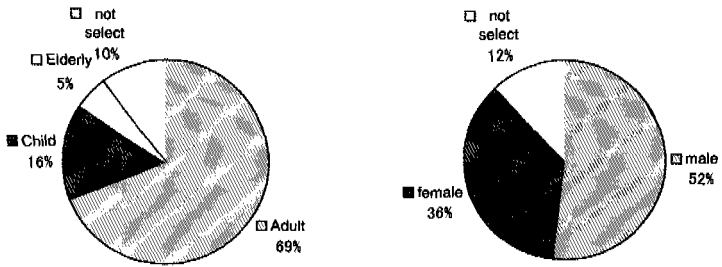
### 2.21.2 Water Voice from around the world concerning Water Development Partners

#### 1) Trends in Water Voice concerning Water Development Partners

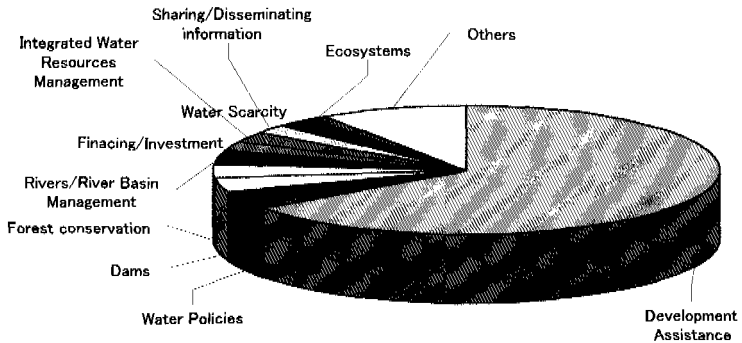
There were 58 Water Voice with respect to Water Development Partners received from all over the world as of the end of January 2003. Regionally, the Asia-Pacific region provided the largest number of Water Voice, followed by Africa and the Americas. In fact, all of the Water Voice from Asia Pacific were from Asia, and the majority of them were from Japan.



Categorization by age group reveals that Water Voice from adults have the largest proportion at about 70 percent, followed by those from children. Based on a breakdown by sex, half of the Water Voice were from males.



Next, classification into 47 subcategories<sup>1)</sup> according to specification by “water voice” contributors on this issue shows that Water Development Partners are associated with development assistance on water, water policies and dams.



## 2) Listening to “Water Voice” concerning Water Development Partners

Classifications of voices on Water Development Partners and the review of the traits of actual Water Voice highlight the following challenges faced by water development partners.

- Working on solutions to serious water problems at national and local levels, promoting the necessary political ties and sharing information on what action should be taken by development partners and NGOs, labor unions, scientists, farmers, local governments, enterprises in the private sector and other parties to define a common goal and to improve collaboration

Listening to the actual Water Voice related to the above problem helps identify the current state of water problems in the world.

Water requirement in the developing or third world region is in high demand. Due to our technological backwardness, we cannot live into necessity of life. The developed world is therefore expected to come in and apply their advantage positions in assistance of this poor region.

Adult male of Nigeria (Voice ID: 24543)

The development assistance especially on the installation of hydropower should involve all stakeholders. This is due to the fact that you may find the location of the hydropower plant being at the tail end of the river while other users are at the upstream. This denies right of use for other users, as water is being guarded to reach the hydropower plant. So consultation with other stakeholders should be done before any installation.

A citizen of Tanzania (Voice ID: 10332)

Cambodia is divided into three as for the water, Phnom Penh and backbone city and farm village. JICA is in Phom Penh, and brilliant improvement is seen. I think that it is the top of the great success case of ODA in Cambodia. But, though the demand is big, it is hard to obtain the water service of the backbone city. The improvement is anticipated drastically if one part of ODA of Phnom Penh can only involve into such a city.

Male of Thailand (Voice ID: 14931)

## 3) Observation

It will be necessary to take the following action to address the challenges mentioned above.

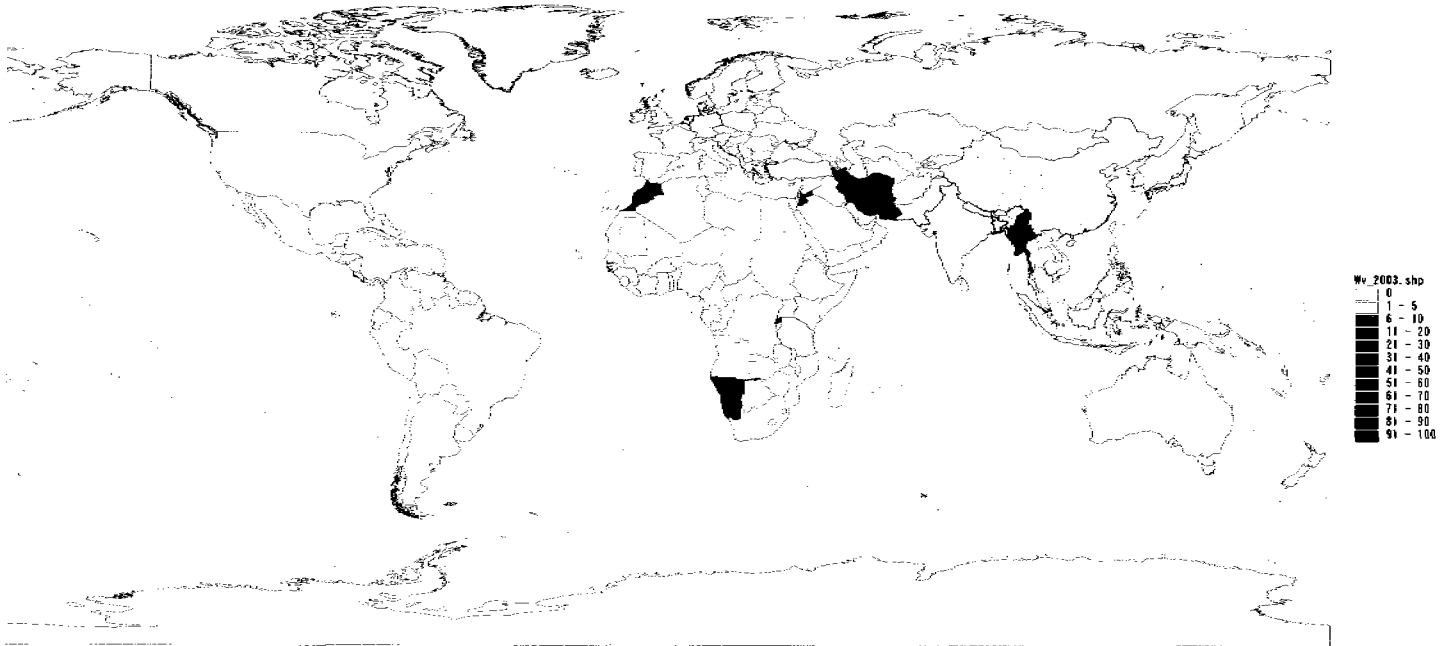
- Collaboration among water development partners to enhance the efficiency and reliability of water services in accordance with the conditions in different countries as well as for financial procurement essential to such enhancement





## 2.22 Dams and Sustainable Development

## Dams and Sustainable Development



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Iran, Myanmar and Namibia are indicated in the darkest red.

## 2.22 Dams and Sustainable Development

### 2.22.1 Dams and Sustainable Development

There are as many as 45,000 major dams in the world. They play various roles, including the supply of potable, farming and industrial water, hydraulic power generation, flood control and recreation to bring benefits to people and to contribute to social development. On the other hand, they have been some negative aspects as well. For instance, those living in the areas submerged by the dams are forced to move. Dams cut off river flows and affect the ecosystem in river basins.

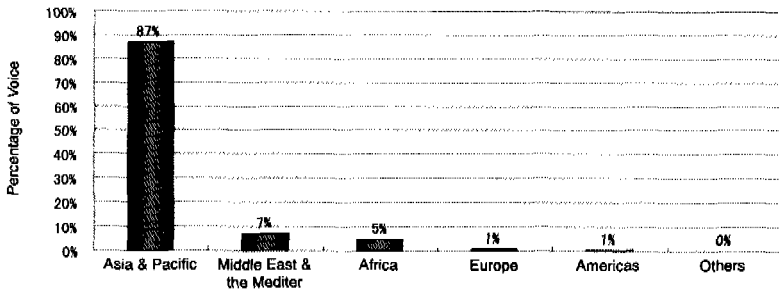
In November 2000, worldwide knowledge on dam construction was collected in a WCD (World Commission on Dams) report. Making suggestions for future dam development, the report caused a major sensation among experts in many different fields associated with dams and among people around the world.

This section presents “Water Voice” about Dams and Sustainable Development from throughout the world, which will deepen understanding of the actual situations and pressing needs concerning water issues to solve the problems related to dams and sustainable development.

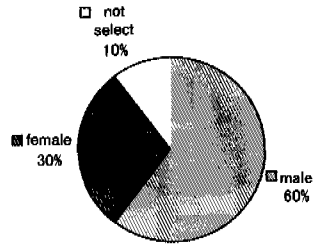
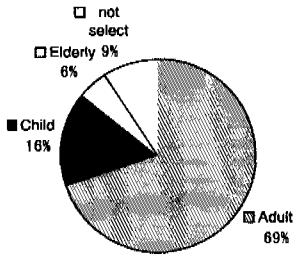
### 2.22.2 Water Voice from throughout the world concerning Dams and Sustainable Development”

#### 1) Tendency of Water Voice concerning Dams and Sustainable Development”

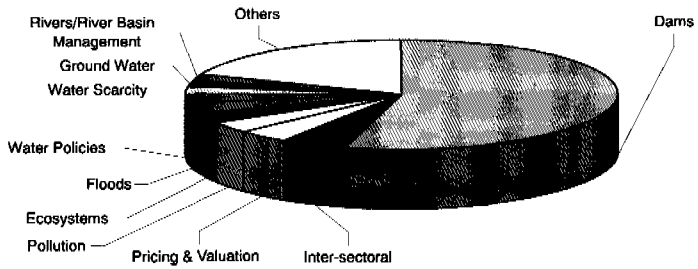
The “Water Voice” from throughout the world concerning Dams and Sustainable Development had added up to 325 as of the end of January 2003. Classification of them by region is overwhelmingly topped by the Asia and Pacific (All from Asia) region, followed by the Middle East and Mediterranean area. The voices from Japan account for about 80 percent of them.



When classified by age, voices from adults account for about 70 percent followed by those from children and classification by sex shows that 60 percent of all voices are from males.



Sorted by subcategory selected from the 47 subcategories<sup>1)</sup> by providers of “Water Voice” on Dams and Sustainable Development, the Water Voice indicate that this issue is typically associated with dams, inter-sectoral issues, pricing and valuation and pollution.



## 2) Listening to “Water Voice” concerning Dams and Sustainable Development

Dams play some roles beneficial to development in hydraulic power generation, production of agricultural products, supply of potable and industrial water, flood control and provision of spheres for recreation. In addition, they increased the proportion of water that can be used by the humans to the recyclable water resources. In response to unevenness in availability of water from geographical and temporal perspectives, dams have without doubt played a key role in satisfying human needs.

On the other hand, many dams have a great impact on their rivers and the ecosystem of the river basins when they have segmented the rivers to disrupt migration of fish or when they have resulted in a reduction of sediment that naturally fertilizes the downstream soil. Dams have a serious social impact as well, given that they oblige many people to be relocated.

The above categorization of “Water Voice” on Dams and Sustainable Development by key word and an analysis on traits of such “Water Voice” lead us to understand that the issue of “dams and sustainable development” is related to the following problem.

### ➤ Roles of dams in controversy

The huge investment on dam construction and its broad impact cause disputes in the locality of dams. There are fierce debates over site selection for existing and planned dams and their impact. In this context, the necessity or adequacy of large-scale dams is the most important question in sustainable development. Proponents point out their social and economic necessity in irrigation, power generation, flood control and water supply. Those against dams question the heavy financial burden, budget overruns of construction costs, relocation and the impoverishment of local residents, destruction of the ecosystem and fishery resources and the unfair distribution of costs and benefits.

Listening to the actual Water Voice related to the above problem helps identify the current state of water problems in the world.

Tanzania is the only country where water for domestic purposes is taken straight from the river. I think storage facilities need to be installed so that unnecessary strains can be avoided especially when the water level in the river goes down. Government should look into this matter.

A Tanzanian citizen (Voice ID: 10345)

The dam has feared that the feeling of an unnecessary thing and the Japanese is becoming since no dam declaration of Governor of Nagano Prefecture. If it goes with this, it is anxious in whether it becomes impossible to build to a required dam. I think that the necessity for a dam should be widely advertised as a country.

Adult male of Japan (Voice ID: 10129)

I was born and grown up in Tsukiyono town, Tone County, Gunma Prefecture, which has the Yagisawa Dam. I want the people in city to save the indispensable water. I want them to know that the multipurpose water in Metropolis of Tokyo is at our expense. My house, school, and the familiar trees were all sunk in the dam. The history in the area and our recollections were all sunk in the dam.

Female of Japan (Voice ID: 5432)

When the Sukhi dam was finalized and the lake filled up our village was flooded. The government resettled us in a different place. They provided water by digging two wells, however the wells turned out to be dry so the government provided water by tankers. But these tankers were very irregular. So finally we complained to the block officer. Finally, we got two hand pumps but the water was saline. We complained again and we got a hand pump outside the village. This one also did not work. Now we fetch water from the wells that are dug in the fields of the neighboring village. We drink the water the people in the neighboring village use it for irrigation.

Female of India (Voice ID: 11686)

When I was little I lived in a place where there were many small reservoirs. I enjoyed picking horsetails, brackens, and other wild plants by the banks of these reservoirs. During the summer time we would use the reservoir as our swimming pool. We also caught carps, eels, fireflies, and various other aquatic animals in the reservoirs, most of them that we no longer can find. In the early fifties, most houses owned cows and the grass that grew by the reservoir bank were their food. Unfortunately, things have changed and people have to come and cut the grass every year. This has brought a big change to the reservoir. Water, which was supposed to be controlled by the river dam, slowly started to pour into reservoir. It has been 30 years since the dam was built and we can no longer control the water without it nor can we just depend on the little reservoir like we used to.

A citizen of Japan (Voice ID: 9015)

### 3) Observations

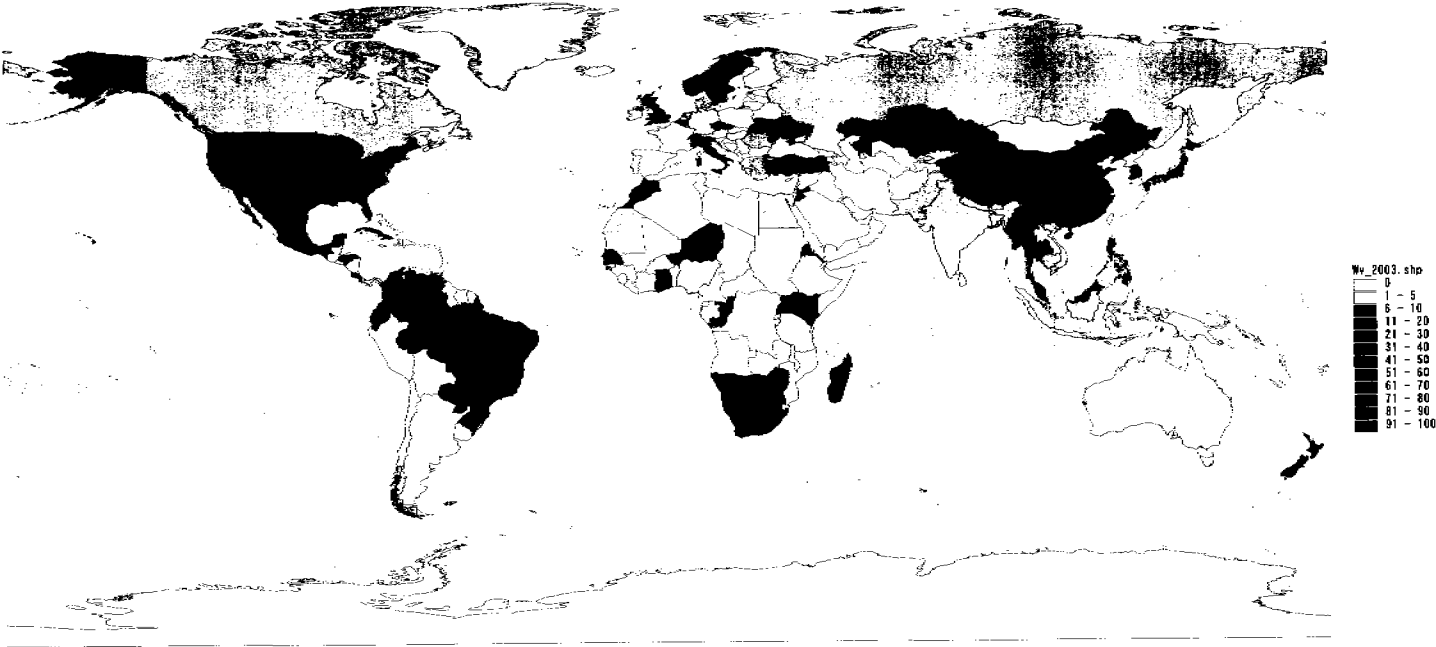
The following actions will be vital in tackling the problems described above.

- Promotion of dialogues over dam construction with a broad cross-section of stakeholders
- Study on a new decision-making procedure for dam construction

## **2.23 Public Private Partnership (PPP)**



# Public Private Partnership



The portion of the number of "water voice" in each country for each theme

The largest portions of the number of "Water Voice" from Norway, South Korea, Swiss and Congo are indicated in the darkest red.

## 2.23 Public Private Partnership (PPP)

### 2.23.1 Public Private Partnership (PPP)

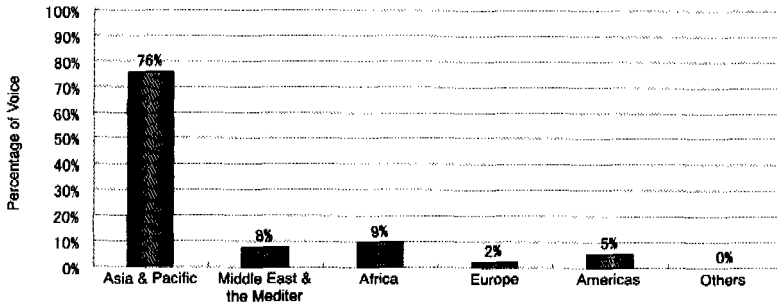
Attracting great interest not only from those involved in water-related businesses and stakeholders but also from the rest of the international community, the question of privatization in the domain of water is heatedly discussed. The debate reflects a confrontation between anxiety about continuing the handover of the water supply and hygiene business to the private sector and improved efficiency in supplying water fairly to all people.

This section presents “Water Voice” about Public Private Partnership (PPP) from throughout the world to enhance our understanding of the current situation surrounding Public Private Partnership through the actual state of water problems and serious demands, from around the globe

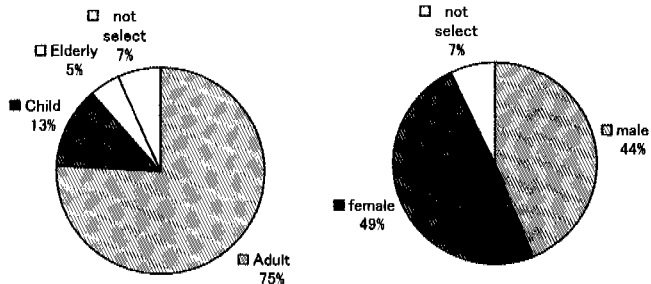
### 2.23.2 Water Voice from throughout the world concerning Public Private Partnership (PPP)

#### 1) Tendencies of Water Voice concerning Public Private Partnership (PPP)

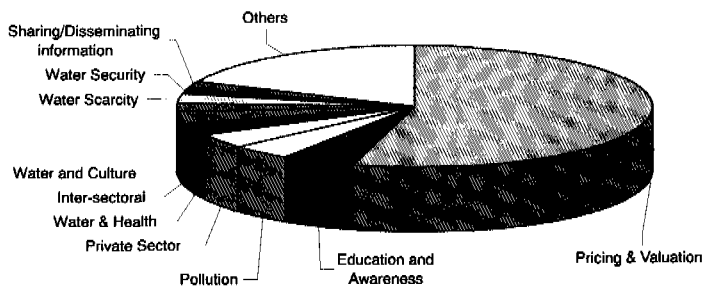
Water Voice from all over the world on Public Private Partnership (PPP) totaled 1,888 as of January 2003. In a region-by-region breakdown, the Asia-Pacific (all from Asia) region offered an unparalleled number of Water Voice, followed by Africa and the Middle East and Mediterranean area. Japan accounted for about 80 percent of the voices from Asia.



Among the age groups, adults provided three quarters of the Water Voice, the largest share, followed by those from children. As for sex, a slight majority of the Water Voice were from females.



Categorization into 47 subcategories<sup>1)</sup> according to specification by “water voice” contributors on this matter shows that Public Private Partnership (PPP) is associated with pricing and valuation, education and awareness, pollution and the private sector.



## 2) Listening to “Water Voice” concerning Public Private Partnership (PPP)

The task of valuing water includes water management in accordance with the economic, social and cultural value of water and the transition to water pricing that ensures that water supply costs are all covered. This approach must take into consideration the fairness and basic needs of the poor. Reorganizing the economic and financial challenges is essential to securing water resources and is a key factor in reform and modernization.

Classifications of voices on Public Private Partnership (PPP) and the review of the traits of actual Water Voice stress the association with the following challenges:

(1) Fulfillment of basic needs in developing countries

(2) Opaque water pricing

Listening to the actual Water Voice related to the above problem helps identify the current state of water problems in the world.

### (1) Fulfillment of basic needs in developing countries

The valuation of water resources has not been introduced to the financial systems that support the operation of water resource management institutions and service providers. There is concern over financial sustainability, including the capabilities to meet needs for investment and devise a fee settlement method for full coverage of the costs, of such organizations in every corner of the globe. *Especially in developing countries it is a major challenge that affects the basic needs of the poor.*

It is recently that a borehole was sunk for us. The water is not that good. It is not not clear. When fetched into a container to stand for some hour's dirt accumulates under the container. The pipes that have been made recently are good but there are only 4 standpipes for the whole community with population of about two million. The cost of the water is also very high and we wish they did something about it for us. The taste is now better than formerly. We have heard of the privatization of water and I do not like the idea. The private sector will likely increase the tariffs bringing more burdens on the poor who cannot afford to pay. This will deny them access to potable water

Male of Ghana (Voice ID: 14146)

### (2) Opaque water pricing

As a widely used solution, subsidization can be effective as long as it is kept transparent and is narrowly targeted at groups that suffer disadvantages. But in many cases, subsidies are “uniformly” offered and prove very obscure. Cost recovery and the pricing scheme involve some difficulties in any region. There are few cases in which service providers, especially government institutions, are provided with sufficient financial grounds for continued operation.

There is no uniformity as regards to principles considerations also adopted by the States in fixing of Water rates. Some of the important factors which are generally taken into consideration are Crop Water requirement, assuredness of supply of water, paying capacity of the farmers based on net/gross value of agricultural produce, cost of supply of water, recommendation of Irrigation Commission etc. But there is no uniformity or consistency as regards to how these factors are employed

Female of India (Voice ID:23153)

### 3) Observations

It will be essential to take the following actions to solve the problems discussed above:

- Water valuing to ensure that the value of water in all applications from all perspectives is reflected in decision making through an approach to promote the necessary management, health improvement, the polluter-pays principle and water resource conservation
- It is necessary to introduce institutional reforms to improve the capabilities of water resource management organizations and service providers to meet demand, and improve the transparency and efficiency of their operation. It is significant to secure the sustainability of both services and the ecosystem that constitutes a background for the supply of water resources.

1) Subcategories

Subcategories	No.
Aquatic Plants & Animals	1
Climate Change	2
Coastal Zone Management	3
Dams	4
Development Assistance	5
Droughts	6
Ecosystems	7
Education and Awareness	8
Energy	9
Ensuring the Knowledge base	10
Financing/Investment	11
Floods	12
Food Security	13
Forest conservation	14
Gender	15
Ground Water	16
Hydrological Cycle	17
Industry and Water	18
Integrated Water Resources Management	19
International Collaboration	20
Inter-sectoral	21
Irrigation	22
Lakes	23
Marine/Sea	24
Pollution	25
Pricing & Valuation	26
Private Sector	27
Public Involvement	28
Rain Water Harvesting	29
Recreation	30
Research and Development	31
Rivers/River Basin Management	32
Sanitation	33
Sharing/Disseminating information	34
Storms and Cyclones	35

Subcategories	No.
Transboundary Water Issues	36
Urbanisation	37
Water & Health	38
Water & Poverty	39
Water and Culture	40
Water Indicator	41
Water Policies	42
Water Re-use	43
Water Scarcity	44
Water Security	45
Water Supply Systems	46
Wetlands	47



## 3. Conclusion





### 3. Conclusion

We have taken a look at “Water Voice” from around the world, sorted by major subject.

The “Water Voice” on different matters raised the following points:

- Water problems are not confined to the question of increasing demand and of mal-distribution. Water-related systems and social practices constitute hindrances to solving these problems. Water problems are a single but major facet of institutional and social problems.
- Water problems derive largely from institutional factors. The mechanism of society, government policies, selection of technologies and personal consumption all have their respective impacts. Radical solutions to water problems require stakeholders to have the capability to manage their own resources to the maximum.
- The “Water Voice” quoted in connection to different subjects suggest that most problems are associated with problems of poverty and gender. Inadequate policies and institutions on water most heavily victimize the poor and women.
- Worse, water-related subsidization and policies in which water is treated as a social good ironically produce further distress for poor people.
- Many Water Voice reflect conflicts over international rivers. Possible solutions to such problems include the furtherance of mutual understanding and cooperation among the countries concerned and partnership among international institutions for intensive implementation of the necessary investment in water.

