



**Results of the 22nd Annual
“Questionnaire on Environmental Problems and the Survival of Humankind”**

Report

THE ASAHI GLASS FOUNDATION

September 2013

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Foreword

This report summarizes the results of the 2013 Questionnaire on Environmental Problems and the Survival of Humankind, a survey conducted annually by the Asahi Glass Foundation since 1992.

Last year, the Foundation presented the “20-Year Summary of the Questionnaire on Environmental Problems and the Survival of Humankind” at the United Nations Conference on Sustainable Development (Rio+20) site in Rio de Janeiro. In addition, we held a press conference at the IUCN World Conservation Congress held in Jeju Island, South Korea, where we presented the results of the 2012 Environmental Doomsday Clock survey.

The first session of the Plenary of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), an intergovernmental organization established last year to strengthen relationships between science and policy, was held this January. With this session, a new international framework is beginning to take shape. The IPBES has been viewed as the IPCC of biodiversity, with many people holding hopes for its success. However, while new frameworks like the IPBES are being embarked on, the concentration of CO₂ exceeded 400 ppm at the Mauna Loa Observatory in Hawaii for the very first time in observational history. The record gave the sense that global warming is not stopping at all, but rather accelerating. But this has not been raised in the world’s public consciousness, and it is extremely unfortunate that the public seemingly does not recognize the gravity of the realities that increased CO₂ concentration holds.

At the Foundation, we sincerely hope that we can contribute what we can towards the resolution of environmental problems by raising environmental interest among as many people as possible through this questionnaire.

We have continued looking at the relationships between the “Environmental Conditions of Concern” and the time on the Environmental Doomsday Clock, to which we added a new aspect of analysis began to do last year. This year, we also indicated what changes each category went through, and devised new ways to display the information that best captured the changes in the opinions of the environmental experts.

In this year’s questionnaire, we asked respondents about environmental problems in urban areas, an issue that may serve as the key to future environmental problems.

The total number of respondents to the questionnaire this year (1,364 respondents) surpassed what was a record number last year (1,100 respondents). We would like to extend our genuine gratitude to the respondents for taking the time to share their valuable opinions and experiences in the survey.

In addition, we would like to express our profound appreciation to Professor Akio Morishima, Special Research Advisor of the Institute for Global Environmental Strategies, for continuing to provide invaluable advice. In closing, we appeal to readers of this report for advice on how to enhance the survey so that it can be made more comprehensive and relevant in the future.

The Asahi Glass Foundation
September 2013

I. Facts about the 22nd Annual “Questionnaire on Environmental Problems and the Survival of Humankind”

Response period: Questionnaires were sent out in April 2013 with a return deadline of June 2013.

Questionnaire respondent pool: Environmental experts selected from members of government organizations, academic institutions, NGOs, corporations, and mass media (based on the Asahi Glass Foundation database).

Questionnaires mailed: 9,027 (7,836 to overseas and 1,191 within Japan)

Questionnaires returned: 1,364

Response rate: 15.1%

Breakdown of respondents by region, gender, and occupational affiliation:

| Region | Number of responses | Percent of total |
|--|---------------------|------------------|
| United States & Canada | 107 | 7.8 |
| Latin America (Central, Caribbean, South) | 38 | 2.8 |
| Western Europe | 108 | 7.9 |
| Eastern Europe & former Soviet Union | 22 | 1.6 |
| Africa | 33 | 2.4 |
| Middle East | 8 | 0.6 |
| India | 22 | 1.6 |
| China | 278 | 20.4 |
| Taiwan | 78 | 5.7 |
| Korea | 46 | 3.4 |
| Japan | 566 | 41.5 |
| Asian Region (Except India, China, Taiwan, Korea, Japan) | 40 | 2.9 |
| Oceania | 15 | 1.1 |
| Total (Including three area unknown responses) | 1364 | 100.0 |

| Gender | Number of responses | Percent of total |
|-------------|---------------------|------------------|
| Male | 1029 | 75.4 |
| Female | 317 | 23.2 |
| No response | 18 | 1.3 |
| Total | 1364 | 100.0 |

| Occupational Affiliation | Number of responses | Percent of total |
|---------------------------------------|---------------------|------------------|
| National government, Local government | 224 | 16.4 |
| University or research institution | 559 | 41.0 |
| Nongovernmental organization | 196 | 14.4 |
| Corporation | 152 | 11.1 |
| Mass Media | 54 | 4.0 |
| Others | 159 | 11.7 |
| No response | 20 | 1.5 |
| Total | 1364 | 100.0 |

*1 Unless otherwise noted, the questionnaire calculated as 100% the total number of responses received for questions where respondents were only asked to choose one item. For questions with multiple selections, the questionnaire calculated the percentages based on the number of times a valid response was given.

*2 Figures have been rounded to the first or second decimal places.

*3 Each question was calculated based on the number of responses to that question and not the number of questionnaires that were returned.

II. Summary of Questionnaire Results

A. Repeat Topics

1. Awareness of the Crisis Facing Human Survival —The Environmental Doomsday Clock

- The average time on the Environmental Doomsday Clock for all respondents was 9:19, indicating approximately the same level of crisis as last year, which was at 9:23.
- Overall, “climate change” was most frequently selected as the top environmental condition of concern in determining the time on the Environmental Doomsday Clock, following the same pattern as last year. This was followed by “pollution/contamination,” and “water resources.”
- Overall, placing the conditions of concern in determining the Environmental Doomsday Clock in order of the time, showed that respondents felt the greatest degree of crisis for “biodiversity,” followed by “climate change,” and “lifestyle.” Further, respondents who selected “biodiversity” as their second and third environmental condition of concern also indicated an extremely high levels of crises, with the most advanced times on the Environmental Doomsday Clock.

B. Main Focus of The Current Year’s Questionnaire

2. Cities and Environmental Problems

This year, we probed respondents about urban areas and their environment, an issue that is growing in importance when considering global environmental problems and their solutions.

- Overall, respondents most frequently selected “the construction of urban infrastructure” (26%) as the most important element in improving the urban environment in the country or region where they resided. This was followed by “the active participation and cooperation of multiple stakeholders” (23%), and “education on urban environmental problems and sharing in the recognition of problems” (20%).
- Overall, respondents most frequently selected “urban planning that aggressively incorporates nature” (13%) as the measure they would most like to see implemented by government agencies to mitigate environmental burden. This was followed by “setting of stringent standards regulating the emissions and discharge of gas, water, and waste from factories, offices, and homes” (12%). There was a broad distribution of responses to this question.
- In order to achieve sustainable cities and reduce the emissions of carbon dioxide, respondents overall most frequently stated that “renewable energy technology” (23%) was the most important, followed by “public transportation networks” (14%).
- Given the expected increase in the world’s urban population, especially in Asia and Africa, respondents overall most frequently stated that “the solution of urban environmental problems that align with the realities in developing regions” (25%) was the most important factor when considering future responses to the world’s urban environmental problems. This was followed by “the solution of urban poverty” (22%).

III. Questionnaire Results

A. REPEAT TOPICS

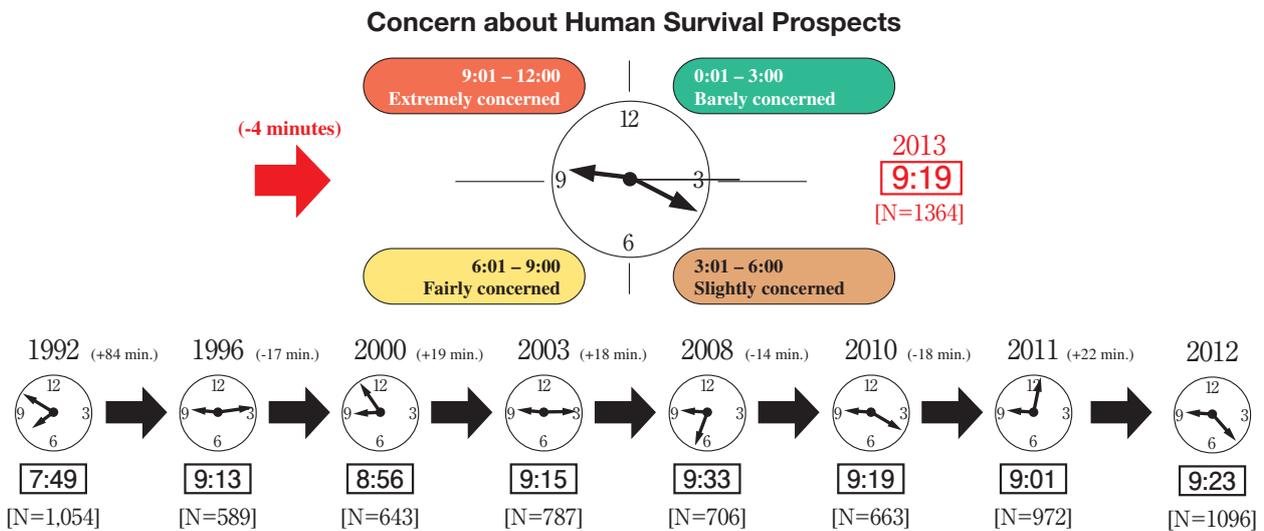
1. AWARENESS OF THE CRISIS FACING HUMAN SURVIVAL (QUESTION 1)

To what extent do you feel that the current deterioration of the environment has created a crisis that will affect the survival of the human race? Please select three environmental issues of greatest concern from the table below, and write a time for each category within the range of 0:01 to 12:00 corresponding to the extent of your concern. In selecting a time, please use units of 10 minutes for ease of calculation.

About the calculation of the time on the Environmental Doomsday Clock

The time on the Environmental Doomsday Clock will be determined by taking the weighted average of the data. The issue ranked in first place will be weighted at 50%, second place at 30%, and third place at 20%.

1-1 The Environmental Doomsday Clock



| | Changes in time from year to year | | | Changes in average time by region | |
|--|-----------------------------------|-------|-------|-----------------------------------|-----------|
| | '08 | '12 | '13 | '08 → '13 | '12 → '13 |
| Total | 9:33 | 9:23 | 9:19 | -14 | -4 |
| United States & Canada | 10:13 | 9:54 | 10:16 | +3 | +22 |
| Latin America | 9:49 | 10:00 | 9:46 | -3 | -14 |
| Western Europe | 9:44 | 9:55 | 9:40 | -4 | -15 |
| Eastern Europe & former Soviet Union | 9:37 | 9:12 | 9:48 | +11 | +36 |
| Africa | 10:31 | 10:04 | 9:42 | -49 | -22 |
| Middle East | 9:24 | 9:38 | 9:08 | -16 | -30 |
| India | 10:05 | 9:10 | 9:27 | -38 | +17 |
| China | 8:03 | 8:49 | 9:16 | +73 | +27 |
| Taiwan | 8:03 | 8:57 | 8:39 | +36 | -18 |
| Korea | 8:51 | 9:33 | 9:31 | +7 | -2 |
| Japan | 9:42 | 9:14 | 9:05 | -37 | -9 |
| Asian Region (except India, China, Taiwan, Korea, Japan) | 10:02 | 9:39 | 9:29 | -23 | -11 |
| Oceania | 10:34 | 10:14 | 10:01 | -33 | -13 |

(Red indicates the advancement in time from last year; green indicates a reversal)

- Overall, the average time on the environmental doomsday clock for all respondents was 9:19, indicating approximately the same level of crisis as last year, which was at 9:23.

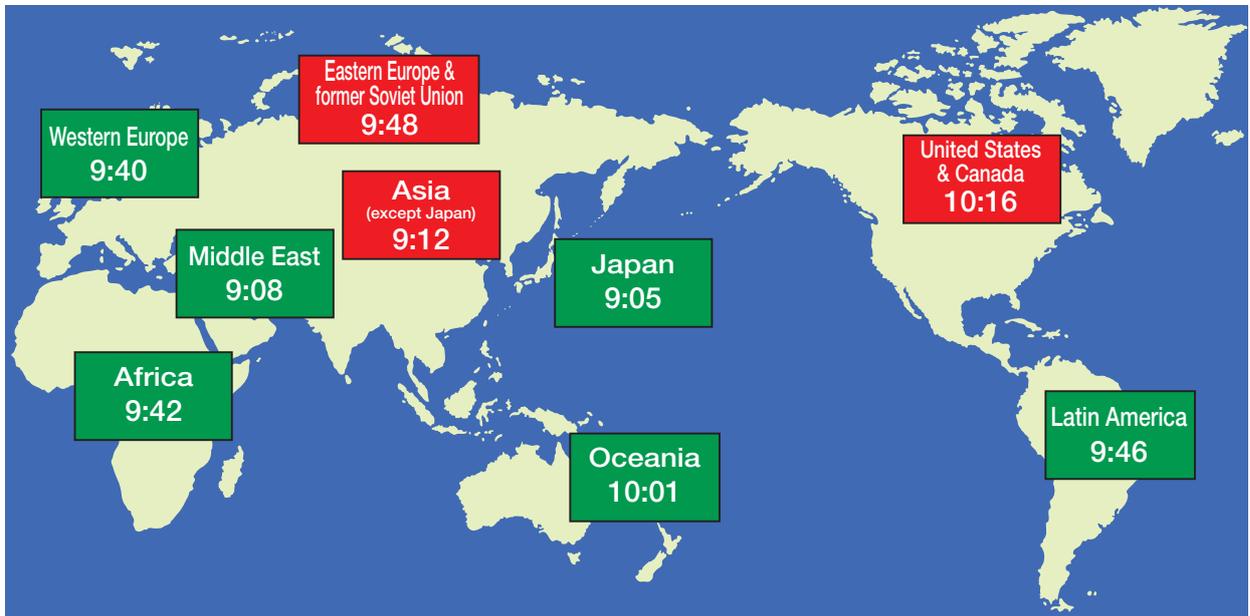
Changes in the Environmental Doomsday Clock (Overall)

| 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 7:49 | 8:19 | 8:47 | 8:49 | 9:13 | 9:04 | 9:05 | 9:08 | 8:56 | 9:08 | 9:05 | 9:15 | 9:08 | 9:05 | 9:17 | 9:31 | 9:33 | 9:22 | 9:19 | 9:01 | 9:23 | 9:19 |

(The time marked in blue represents the lowest sense of crisis since the inception of the survey in 1992; the red marks the highest)



Regional Times

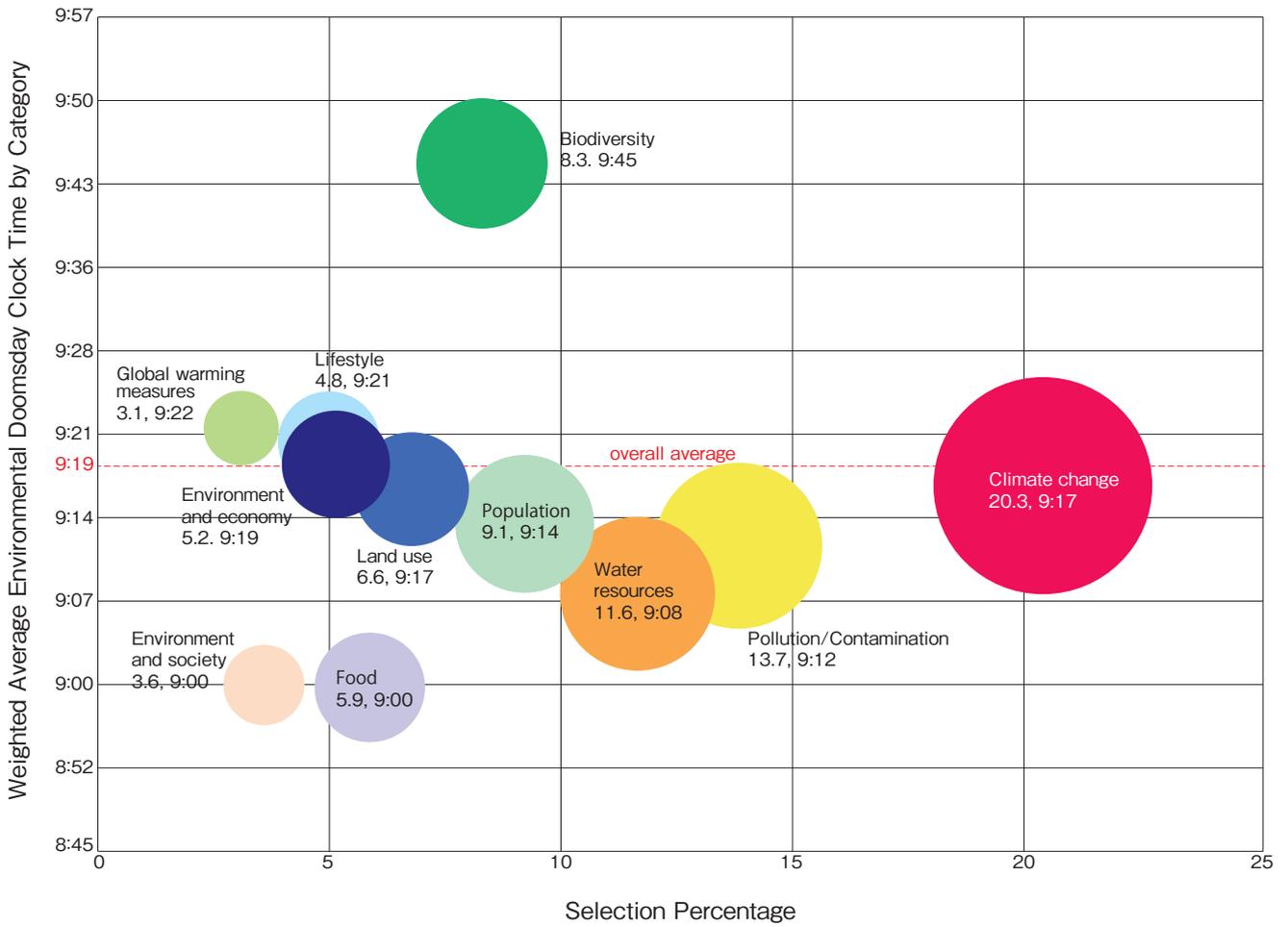


(Red indicates the advancement in time from last year; green indicates reversal)

1-2 Environmental Conditions of Concern

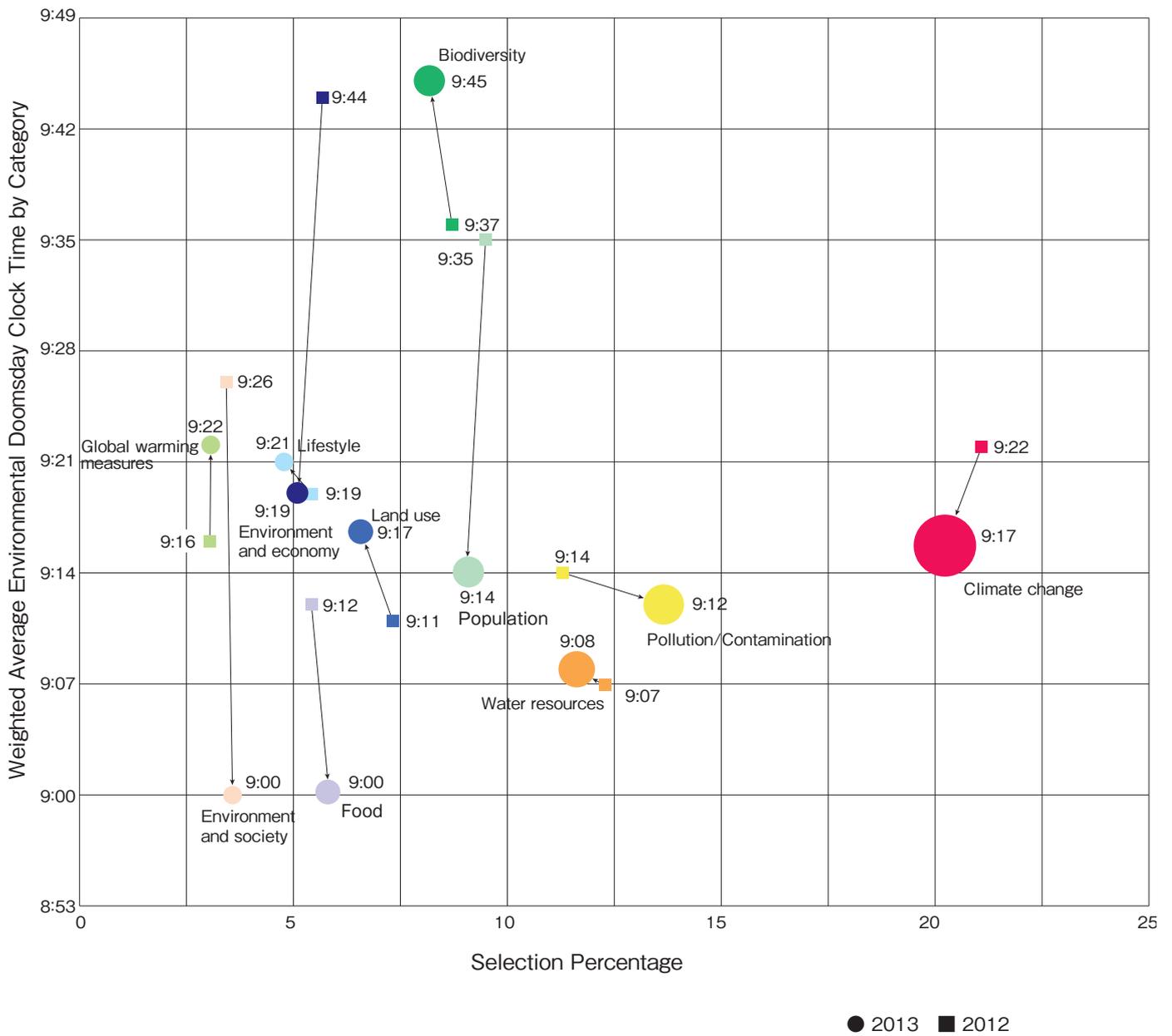
| Category | Main Elements |
|-----------------------------|---|
| 1. Climate Change | Atmospheric concentration of CO₂ ; global warming ; ocean acidification ; climatic aberrations (droughts, torrential rains and flooding, severe storms, heavy snow, abnormal temperatures, drying of rivers and lakes, desertification, etc.) |
| 2. Biodiversity | Acceleration of species extinction ; effects of contamination, climate change, land use |
| 3. Land Use | Expansion of cultivated land mass; destruction of forests due to excessive development; desertification caused by overgrazing; agriculture and land use without regard for the environment; urbanization |
| 4. Pollution /Contamination | River and ocean pollution : eutrophication caused by excessive nitrogen and phosphorus and contamination by chemical substances; atmospheric pollution : particulates suspended in the atmosphere, soot and chemical substances |
| 5. Water Resources | Diminution of usable fresh water resources (depletion, contamination) |
| 6. Population | Population growth beyond what the Earth can support; aging of the population |
| 7. Food | Diminution of food supply from land and oceans |
| 8. Lifestyles | Transformation of lifestyles away from excessive consumption of resources like energy |
| 9. Global Warming Measures | Progress of measures for mitigation and adaption |
| 10. Environment and Economy | <u>Progress towards implementing an economic system to reflect environmental costs</u> , the bearing of social costs : imposition of taxes for fossil fuels that emit CO ₂ , which causes global warming-related damages; TEEB (The Economics of Ecosystems and Biodiversity), etc. <u>The operation of an environmentally conscious economy</u> : the realization of a green economy , sustainable economic development, etc. |
| 11. Environment and Society | Environmental awareness at the individual and societal levels, progress of environmental education ; poverty ; the status of women |
| 12. Other | () |

1. Overall Analysis of the Environmental Conditions of Concern (Categories Ranked 1 -3)



- When placing the environmental conditions of concern in the order in which respondents most frequently selected them, “climate change” ranked the highest overall at 20%. This was followed by “pollution/contamination” at 14%, “water resources” at 12%, “population” at 9%, and “biodiversity” at 8%.
- Of the environmental conditions of concern, the Environmental Doomsday Clock time averaged 9:45 for “biodiversity,” indicating a particularly heightened sense of crisis. This was the most advanced time among all categories chosen as the three most pressing conditions of concern.
- The distribution of the time on the Environmental Doomsday Clock time for the other categories concentrated between 9:00 and 9:22.

2. Distribution of the Environmental Conditions of Concern (Categories Ranked 1)



- No significant changes were seen in the rates at which respondents selected each category.
- The time on the Environmental Doomsday Clock advanced by 8 minutes for “biodiversity” to 9:45, placing it 20 to 45 minutes ahead of the other categories.

3. Selection Analysis By Region for Environmental Conditions of Concern

| | Climate Change | Biodiversity | Land use | Pollution/Contamination | Water resources | Population | Food | Lifestyle | Global warming measures | Environment and economy | Environment and economy | other |
|--------------------------------------|----------------|--------------|----------|-------------------------|-----------------|------------|------|-----------|-------------------------|-------------------------|-------------------------|-------|
| Total | 20 | 8 | 7 | 14 | 12 | 9 | 6 | 5 | 3 | 5 | 4 | 1 |
| United States & Canada | 26 | 11 | 7 | 7 | 15 | 12 | 2 | 4 | 3 | 4 | 3 | 2 |
| Latin America | 18 | 9 | 9 | 14 | 16 | 12 | 4 | 4 | 6 | 4 | 2 | 0 |
| Western Europe | 22 | 11 | 9 | 9 | 11 | 13 | 3 | 6 | 2 | 6 | 4 | 1 |
| Eastern Europe & former Soviet Union | 15 | 5 | 8 | 11 | 17 | 5 | 3 | 9 | 5 | 11 | 8 | 2 |
| Africa | 22 | 13 | 12 | 6 | 10 | 5 | 5 | 4 | 0 | 10 | 4 | 2 |
| Middle East | 21 | 0 | 4 | 17 | 17 | 13 | 4 | 4 | 13 | 4 | 4 | 0 |
| India | 18 | 5 | 13 | 10 | 23 | 5 | 5 | 3 | 0 | 7 | 5 | 0 |
| China | 13 | 4 | 7 | 20 | 13 | 4 | 4 | 4 | 1 | 4 | 2 | 0 |
| Taiwan | 26 | 6 | 9 | 20 | 9 | 7 | 4 | 5 | 3 | 8 | 2 | 0 |
| Korea | 25 | 11 | 5 | 9 | 11 | 5 | 8 | 9 | 3 | 4 | 7 | 1 |
| Japan | 21 | 9 | 5 | 13 | 10 | 12 | 9 | 5 | 4 | 5 | 4 | 2 |
| Asian Region* | 23 | 10 | 7 | 12 | 17 | 5 | 3 | 6 | 4 | 7 | 3 | 1 |
| Oceania | 27 | 16 | 9 | 4 | 4 | 11 | 2 | 7 | 0 | 11 | 7 | 2 |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates selection for rank 1, blue indicates rank 2)

- Respondents in all regions except those in Eastern Europe & former Soviet Union, India, and China most frequently selected “climate change” as their first environmental conditions of concern. Respondents in India and Eastern Europe & former Soviet Union most frequently selected “water resources,” as their top-ranking issue, while those in China chose “pollution/contamination.”
- The second-rank issue in most regions concentrated on “pollution/contamination” and “water resources.” Respondents in Taiwan, the Middle East, and Japan most frequently selected “pollution/contamination” as their second-most important issue, whereas respondents in Latin America, United States & Canada, China, and Korea selected “water resources.” Respondents in Oceania, Africa, and Korea most frequently selected “biodiversity.” (Note: In Africa, the Middle East, Korea, and Japan, respondents selected two categories for the second-rank issue at nearly the same rate.)

4. Geographical Distribution of the Environmental Doomsday Clock Time for Environmental Conditions of Concern

Categories and the distribution of the weighted average of the Environmental Doomsday Clock Time by Region

| | Total | Climate Change | Biodiversity | Land use | Pollution/Contamination | Water resources | Population | Food | Lifestyle | Global warming measures | Environment and economy | Environment and economy |
|--------------------------------------|-------|----------------|--------------|----------|-------------------------|-----------------|------------|-------|-----------|-------------------------|-------------------------|-------------------------|
| Total | 9:19 | 9:17 | 9:45 | 9:17 | 9:12 | 9:08 | 9:14 | 9:00 | 9:21 | 9:22 | 9:19 | 9:00 |
| United States & Canada | 10:16 | 10:40 | 10:19 | 10:15 | 9:23 | 9:36 | 10:41 | - | 10:38 | 10:48 | 10:48 | 10:13 |
| Latin America | 9:46 | 9:17 | 10:20 | 10:34 | 9:37 | 9:04 | 10:06 | 9:44 | 10:42 | - | - | - |
| Western Europe | 9:40 | 9:31 | 10:24 | 8:30 | 9:34 | 9:09 | 9:48 | 9:49 | 9:20 | 9:04 | 9:49 | 8:20 |
| Eastern Europe & former Soviet Union | 9:48 | 10:03 | - | - | 10:44 | 8:46 | - | - | 10:18 | - | - | - |
| Africa | 9:42 | - | 10:08 | - | 9:46 | - | 8:54 | - | 9:30 | - | 9:43 | 9:30 |
| Middle East | 9:08 | 9:12 | - | - | 9:11 | - | 9:43 | - | - | - | - | - |
| India | 9:27 | 9:34 | - | 9:39 | - | 9:10 | 9:23 | - | - | - | 10:14 | - |
| China | 9:15 | 8:59 | 9:01 | 9:06 | 9:23 | 9:28 | 8:52 | 9:51 | 8:56 | 9:04 | 9:03 | 9:42 |
| Taiwan | 8:39 | 8:30 | 8:55 | 8:41 | 9:09 | 7:53 | 8:27 | 8:23 | - | 9:10 | 8:26 | 9:14 |
| Korea | 9:31 | 9:33 | 9:54 | 8:50 | 9:37 | 9:26 | - | 9:24 | 9:54 | 7:54 | - | 9:06 |
| Japan | 9:05 | 9:06 | 9:35 | 9:07 | 8:51 | 8:49 | 8:59 | 8:36 | 9:08 | 9:16 | 8:55 | 8:30 |
| Asian Region* | 9:29 | 9:38 | 10:40 | 9:23 | 8:18 | 9:32 | 9:14 | 10:42 | 8:22 | 9:23 | - | 8:23 |
| Oceania | 10:01 | - | 9:56 | - | - | - | 10:12 | - | - | - | 10:16 | - |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates the 10 o'clock hour, yellow the 9 o'clock hour, and green the 8 o'clock hour)

- The average time on the Environmental Doomsday Clock among respondents in the United States & Canada and Oceania surpassed 10 o'clock. The average time for respondents from other regions, with the exception of Taiwan, was in the 9 o'clock hour.
- Respondents in the United States & Canada recorded a time in the 10 o'clock hour for all “Environmental Conditions of Concern” except “food,” “water resources,” and “pollution/contamination.”

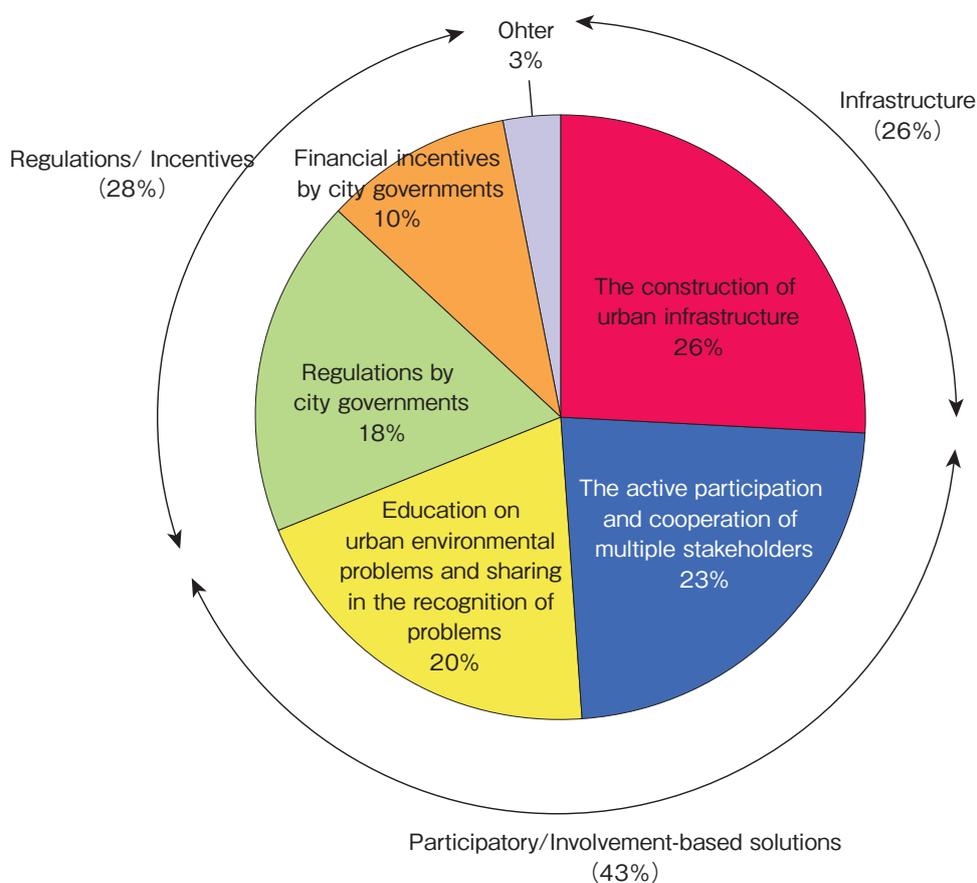
B. MAIN FOCUS OF THE CURRENT YEAR'S QUESTIONNAIRE

2. CITIES AND ENVIRONMENTAL PROBLEMS (QUESTION 2)

At present, more than half of the world's 7.1 billion people live in urban areas. Further, estimates say that nearly 70% of the world's carbon dioxide emissions are produced in these urban areas. The urban population is projected to continue growing rapidly, and as such, the importance of cities is growing significantly in considering environmental problems.

2-1 Please select two items from the categories A through F listed below that you think are the most important elements in improving the urban environment in the country or region where you reside.

Q2-1.important elements in improving the urban environment in the country or region



- A combined 43% of respondents selected participatory and involvement-based solutions, with “the active participation and cooperation of multiple stakeholders” at 23% and “education on urban environmental problems and sharing in the recognition of problems” at 20%. This was followed by a combined 28% of respondents who selected regulatory and incentive-based solutions, with “regulations by city governments” at 18% and “financial incentives by city governments” at 10%.
- By individual category, respondents most frequently selected “the construction of urban infrastructure” at 26%, followed by “the active participation and cooperation of multiple stakeholders” at 23%

| | Important Elements in Improving the Urban Environment in the Country or Region | | | | | Other |
|---|--|---|---|------------------------------------|---|-------|
| | Infrastructure (26%) | Participatory/Involvement-based solutions (43%) | | Regulations/ Incentives (28%) | | |
| | The construction of urban infrastructure | The active participa- tion and cooperation of multiple stakeholders | Education on urban en- vironmental problems and sharing in the rec- ognition of problems | Regulations by city governments | Financial incentives by city governments | |
| Total | 26 | 23 | 20 | 18 | 10 | 3 |
| United States & Canada | 27 | 27 | 15 | 17 | 8 | 7 |
| Latin America | 24 | 26 | 21 | 14 | 12 | 3 |
| Western Europe | 27 | 23 | 16 | 20 | 8 | 6 |
| Eastern Europe & former Soviet Union | 27 | 39 | 5 | 16 | 11 | 2 |
| Africa | 20 | 31 | 20 | 20 | 6 | 3 |
| Middle East | 38 | 19 | 6 | 19 | 19 | 0 |
| India | 20 | 30 | 20 | 20 | 10 | 0 |
| China | 27 | 22 | 16 | 22 | 12 | 1 |
| Taiwan | 32 | 13 | 24 | 22 | 9 | 1 |
| Korea | 23 | 24 | 30 | 18 | 2 | 1 |
| Japan | 25 | 23 | 24 | 14 | 11 | 4 |
| Asian Region* | 18 | 27 | 21 | 24 | 5 | 5 |
| Oceania | 37 | 23 | 10 | 20 | 7 | 3 |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates the top-ranked response while the blue indicates the second-ranked response. However, where two responses tied for the first rank, the second rank is not colored in)

- By region, respondents in the Middle East (38%), Oceania (37%), Taiwan (32%), United States & Canada (27%), Western Europe (27%), China (27%), and Japan (25%) most frequently selected “the construction of urban infrastructure” as the most important element in improving the urban environment in the country or region where they resided.
- On the other hand, the “active participation and cooperation of multiple stakeholders” was most frequently selected as the most important element by respondents in Eastern Europe & the former Soviet Union (39%), Africa (31%), India (30%), United States & Canada (27%), Asian Region (27%), and Latin America (26%).
- Respondents in Korea (30%) most frequently selected “education on urban environmental problems and sharing in the recognition of problems” as the most important factor; this was also the second most frequently selected factor by respondents in Japan (24%).

2-2 In order to mitigate the environmental burden, what would you like to see in the measures and strategies implemented by government agencies? Please select three items from the categories A through M listed below. (For respondents who do not reside in urban areas, please select your responses based on your understanding and knowledge of the situation.)

| | Desirable Elements in Measures and Strategies by Government Agencies to Mitigate Environmental Burden | | | | | | | | | | | | |
|--------------------------------------|---|--|--|---|--|--|---------------------------------------|--|--|--|--|-------------------------------------|---|
| | Nature (19%) | | Regulations/Standards (36%) | | | | | Infrastructure (27%) | | | Others (14%) | | |
| | Urban planning that strongly incorporates nature | Urban greening (of roofs, walls, train tracks) | Stringent standards regulating discharge of gas, water, and waste from factories, offices, homes | Stringent standards for auto emissions and energy waste | Energy conservation standards for city buildings and structures (insulation of walls, roofs, and windows, greening of roofs) | Incentives for energy conservation products and construction | Labeling energy conservation products | Improvements in electricity infrastructure | Optimization of transportation networks and transportation information systems | Improvements in waste/water treatment infrastructure | Strengthening environmental education (energy/resource conservation, pollution prevention) | Strengthening anti-poverty measures | |
| Total | 13 | 6 | 12 | 9 | 8 | 5 | 2 | 9 | 9 | 9 | 10 | 4 | 4 |
| United States & Canada | 14 | 5 | 9 | 8 | 11 | 6 | 1 | 10 | 14 | 4 | 6 | 6 | 4 |
| Latin America | 12 | 6 | 11 | 7 | 4 | 5 | 1 | 4 | 16 | 9 | 12 | 12 | 1 |
| Western Europe | 14 | 6 | 10 | 10 | 15 | 4 | 3 | 6 | 10 | 5 | 9 | 5 | 2 |
| Eastern Europe & former Soviet Union | 9 | 9 | 12 | 6 | 12 | 6 | 5 | 5 | 11 | 8 | 8 | 9 | 2 |
| Africa | 10 | 6 | 14 | 3 | 4 | 8 | 3 | 10 | 5 | 9 | 14 | 12 | 0 |
| Middle East | 8 | 4 | 21 | 0 | 8 | 13 | 8 | 8 | 8 | 8 | 4 | 8 | 0 |
| India | 15 | 7 | 15 | 3 | 3 | 3 | 3 | 3 | 5 | 18 | 12 | 8 | 2 |
| China | 10 | 8 | 13 | 16 | 7 | 6 | 1 | 3 | 8 | 14 | 7 | 3 | 0 |
| Taiwan | 15 | 5 | 17 | 8 | 3 | 5 | 7 | 11 | 5 | 9 | 11 | 4 | 0 |
| Korea | 7 | 6 | 19 | 24 | 17 | 4 | 2 | 4 | 3 | 7 | 5 | 2 | 2 |
| Japan | 15 | 6 | 11 | 6 | 8 | 5 | 2 | 14 | 9 | 8 | 11 | 3 | 2 |
| Asian Region* | 11 | 7 | 12 | 5 | 7 | 6 | 1 | 5 | 10 | 14 | 12 | 9 | 1 |
| Oceania | 13 | 2 | 18 | 7 | 16 | 2 | 4 | 13 | 9 | 4 | 4 | 4 | 2 |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates the top-ranked response while the blue indicates the second-ranked response. However, where two responses tied for the first rank, the second rank is not colored in)

- Overall, respondents most frequently selected regulatory and standards-based solutions, at 36%. This was followed by infrastructure-based solutions (27%), categories relating to the use of natural resources (19%), and other measures (14%).
- By individual category, respondents overall most frequently selected “urban planning that aggressively incorporates nature” at 13%, followed by “setting of stringent standards regulating the emissions and discharge of gas, water, and waste from factories, offices, and homes,” at 12%. Generally, there was a wide distribution of responses to this question.

2-3 In order to achieve sustainable cities and reduce the emissions of carbon dioxide, what do you think will become the most important technology, product, or system? Please select three items from the categories A through L below.

| Important technology, product, or system for achieving CO ₂ reductions and sustainable cities | | | | | | | | | | | | | |
|--|--|---|---|--------------------|--------------------------------|-------------------------------|--|-----------------------|-------------------------|---------------------------------|-------|---|--|
| Generation/recovery of resources (45%) | | | Limiting the use of resources (reduce output) | | | | | | | | Other | | |
| Orienting towards a recycling society (45%) | | | Electricity and power generation (19%) | | | Transportation systems (19%) | | | Other technology (15%) | | | | |
| Recyclable energy technology | Recovering resources from waste from factory/office/home | Recovering exhaust heat from water and gas emissions from factory/office/home | Energy conservation products | Smart grid systems | Home energy storage technology | Public transportation systems | Automotive transportation management systems | Low pollution engines | Insulation technologies | Permeable pavement technologies | Other | | |
| Total | 23 | 11 | 11 | 9 | 6 | 4 | 14 | 5 | 9 | 4 | 2 | 1 | |
| United States & Canada | 24 | 9 | 6 | 8 | 5 | 3 | 18 | 3 | 11 | 5 | 2 | 4 | |
| Latin America | 23 | 12 | 7 | 9 | 4 | 1 | 24 | 6 | 13 | 0 | 1 | 0 | |
| Western Europe | 23 | 8 | 7 | 10 | 5 | 5 | 22 | 3 | 10 | 7 | 0 | 1 | |
| Eastern Europe & former Soviet Union | 21 | 12 | 3 | 12 | 3 | 9 | 12 | 5 | 12 | 6 | 2 | 3 | |
| Africa | 25 | 9 | 7 | 15 | 4 | 6 | 14 | 8 | 10 | 0 | 0 | 1 | |
| Middle East | 29 | 8 | 13 | 4 | 0 | 4 | 25 | 4 | 8 | 4 | 0 | 0 | |
| India | 23 | 15 | 7 | 15 | 2 | 3 | 13 | 3 | 10 | 2 | 2 | 0 | |
| China | 21 | 13 | 17 | 9 | 3 | 3 | 11 | 5 | 13 | 2 | 1 | 0 | |
| Taiwan | 18 | 5 | 17 | 9 | 7 | 0 | 14 | 6 | 15 | 5 | 4 | 0 | |
| Korea | 26 | 15 | 10 | 11 | 2 | 3 | 13 | 2 | 9 | 7 | 0 | 1 | |
| Japan | 24 | 12 | 10 | 7 | 9 | 5 | 12 | 5 | 5 | 5 | 2 | 2 | |
| Asian Region* | 22 | 13 | 9 | 12 | 3 | 2 | 21 | 7 | 8 | 1 | 2 | 0 | |
| Oceania | 20 | 7 | 9 | 13 | 4 | 4 | 22 | 0 | 9 | 4 | 0 | 7 | |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates the top-ranked response while the blue indicates the second-ranked response. However, where two responses tied for the first rank, the second rank is not colored in)

- Classifying the responses into broad categories revealed that 45% of the respondents selected solutions related to orienting towards a recycling society, electricity and power generation (19%), transportation systems (19%), and other technologies (15%).
- By individual category, respondents most frequently selected “recyclable energy technology (23%),” followed by “public transportation systems” in second place at 14%.

2-4 The world's urban population is expected to continue growing, with the growth particularly pronounced in developing regions like Asia and Africa. Given this circumstance, what do you think are the important elements when considering future responses to the world's urban environmental problems? Please select two items from the categories A through G below.

Results of the item selections by each region/country

| | Important elements when considering future responses to the world's urban environmental problems | | | | | | |
|--------------------------------------|--|--|---------------------------|-------------------------|--|---|-------|
| | Approaches (35%) | | Societal policies (39%) | | Outside aid (24%) | | Other |
| | Solutions to urban environmental problems that align with developing region realities | Urban environmental governance that sufficiently considers effects on neighboring ecosystems | Solution of urban poverty | Environmental education | Technological transfers and sharing of know-how of excellent environmental and anti-pollution measures | Active involvement of central government and the U.N. on urban environmental problems | |
| Total | 25 | 10 | 22 | 17 | 18 | 6 | 2 |
| United States & Canada | 29 | 12 | 20 | 11 | 14 | 4 | 10 |
| Latin America | 26 | 12 | 17 | 21 | 16 | 4 | 4 |
| Western Europe | 28 | 7 | 22 | 17 | 18 | 4 | 5 |
| Eastern Europe & former Soviet Union | 14 | 7 | 23 | 25 | 18 | 11 | 2 |
| Africa | 21 | 8 | 27 | 21 | 18 | 3 | 2 |
| Middle East | 19 | 13 | 19 | 25 | 25 | 0 | 0 |
| India | 20 | 13 | 18 | 20 | 25 | 3 | 3 |
| China | 17 | 12 | 26 | 15 | 25 | 5 | 1 |
| Taiwan | 26 | 16 | 18 | 20 | 15 | 5 | 0 |
| Korea | 36 | 10 | 24 | 9 | 15 | 6 | 0 |
| Japan | 28 | 8 | 20 | 19 | 16 | 8 | 1 |
| Asian Region* | 27 | 10 | 24 | 14 | 17 | 7 | 1 |
| Oceania | 30 | 13 | 20 | 13 | 13 | 7 | 3 |

*With the exception of India, China, Taiwan, Korea, and Japan (Red indicates the top-ranked response while the blue indicates the second-ranked response. However, where two responses tied for the first rank, the second rank is not colored in)

- Classifying the responses into broad categories revealed that they were distributed among societal policies (39%), approach (35%), and outside aid (24%). There is widespread interest for the solution of urban poverty and environmental education.
- By individual category, respondents overall most frequently selected “solutions to urban environmental problems that align with developing region realities” at 25% and “solution of urban poverty” at 22%. On the other hand, “active involvement of central government and the U.N. on urban environmental problems” only attracted a low level of interest. Respondents in the Middle East, India, and China showed a high level of interest towards “technological transfers of environmental technology.”

IV. Comments from Respondents

This year's questionnaire elicited a total of 576 comments, the highest numbers since the inception of the survey in 1992, including 280 from 55 countries outside Japan and 296 from Japan. The comments provided invaluable information and opinions about the realities of environmental problems across the world as well as measures and ideas to improve the global environment. Overall, we received numerous comments expressing opinions on responses to environmental problems and possible future directions, whereas many respondents in Japan commented on the environmental problems and themes facing the country, as well as suggestions on strategies moving forward.

This year, the Comments from Respondents section includes all comments from overseas respondents. Those from Japan include 42 comments that have been organized into two themes. The suggestions about the questionnaire itself, which provide valuable input for the Foundation, have been excluded for this publication. We have included the name, organization, title, country, and our identification number along with the comments, unless the respondent requested anonymity, in which case we have identified only as M for male respondents and F for female respondents.

note: All the comments were made by respondents but not necessary reflected the view of the Asahi Glass Foundation

Comments from overseas

[How to Address Environmental Problems]

To solve environmental problems, we need to compromise other areas such as urban planning, lifestyle and etc.

F, Seoul Institute, REPUBLIC OF KOREA, K002

I believe that specific figure-based provisions are more useful than laws and regulations that are stipulated in general terms.

Yang Hailing, Section Member, Planning Management Office of Taicang City, CHINA, C005

Environmental protection is an issue that affects the entire world, while the world consists of countries and the countries consist of people. It is inappropriate to achieve development but ignore environmental protection, or to achieve environmental protection but ignore development. Moreover, environmental protection following development is merely a remedial measure. How can environmental protection be achieved to the maximum possible extent? By implementing the maximum amount of education in environmental protection! To be precise, everyone commences environmental protection voluntarily with himself or herself. How can environmental management be achieved while achieving development? By establishing and perfecting the relevant systems!

F, CHINA, C008

To solve environmental problems, the public-private partnership is important.

M, PurenPyeongtaek21, REPUBLIC OF KOREA, K011

Forming a committee at the level of government and corporations.

F, REPUBLIC OF KOREA, K016

The solution to environmental problems cannot merely rely on a single organization or a single country. Instead, it requires participation of the entire world and all governments and local residents. Only through full-scale participation can the problems be solved.

*Li Kai-Jing, Master's Program of Regional Policy and Development,
Department of Public and Cultural Affairs / Student, National Taitung University, TAIWAN, T017*

Environmental problems involve extensive, wide-ranging issues that require negotiation and coordination between countries in order to develop solutions for alleviating and reducing the problems.

M, National Taitung University, TAIWAN, T021

Development of developing nations.

M, Music for One Foundation, REPUBLIC OF KOREA, K032

China's environmental protection should be treated as a separate issue in law, and it is necessary to strive to improve the humanistic quality of the people, as well as formulate relevant laws and regulations and implement them unequivocally.

Xiang Shen, Engineer, Chinese Academy of Sciences, CHINA, C033

To accomplish sustainable development, people need to participate actively.

Gayoung Kim, Korea Green Foundation, REPUBLIC OF KOREA, K034

A policy-based approach to environmental problem is needed.

Hyejin Uh, Team manager, Green Film Festival in Seoul, REPUBLIC OF KOREA, K039

Key elements in all solutions and approaches need to be: empowerment of individuals; participation in multi-stakeholder, trans-disciplinary teams; a focus on low-tech and small-scale solutions; and the creation of appropriate complementary economic systems.

F, Global Action Plan International, SWEDEN, E036

Environmental problems and solutions should be understood and addressed both on the global and local scales. In my view, so far, more attention has been given to climate change and other problems that attract the attention of international communities. The progress made in this regard is more on policy level than in practice. Although issues such as climate change and loss of biodiversity are globally important, others such as soil erosion, deforestation, etc. are important on the local levels particularly in developing countries. They can be understood by investigating interlinked factors of local regional and global nature. Actions should also consider all scales to make problem definition and implementation participatory.

M, University of Bonn, GERMANY, E043

We must take the environmental questions specifically. Algerian problems are not the same than Japanese ones.

Mourad AHMIM, lecturer – researcher, Facult des Sciences de la Nature et de la Vie,

Universit Abderrahmane MIRA- Bejaia, ALGERIA, E051

Regarding the Earth's environmental problems, the most direct impact is "sustainable development." Under global environmental change, how to obtain a balance between resource, development, and environmental conflicts has become the main issue. When handling the issue, avoid focusing merely on the solution as that may result in more problems. Comprehensive consideration is recommended.

F, Council for Economic Planning and Development, TAIWAN, T052

Environmental issues can't be considered in a vacuum, but must be tied to education and economic growth.

F, Journalist, U.S.A., 056

Like the united battles against dictatorships in the forties and the fight against terrorism in the twenty first century the whole global community has to unite fight against environmental destruction that is caused locally, regionally and globally.

Ajith Tennakoon, Regional Director, Environmental/Natural Resource, Sewalanka Foundation, SRI LANKA, E061

From time immemorial, the ... incessant but haphazard efforts of man to use the natural resource ensemble of the Earth ... has resulted in the present day colossal disruption of its ecological matrix. Consequently, there has emerged an enormous global environmental crisis characterized by land degradation, loss of biological diversity, desertification, deforestation, pollution of land, water and air, ozone layer depletion and global warming, et cetera, threatening the very existence of mankind on the planet. So the prime need of the hour is not only to ameliorate these disastrous ailments of the environment in different parts of the world, at local, regional, national and international levels, but also, to adopt integrated, innovative, and realistic programs to control the rapidly increasing human population. A symbiotic relationship, with cooperation between the variegated activities of Homo sapiens and the physical traits of the natural resource base is the only hope to protect ... the planet and provide a better habitat for sustainable living in the 21st Century. In this crusade, the cooperative and joint role of academic, research organizations, policy architects in the government, planners and common people themselves is the prerequisite condition, if the mother Earth is to be saved from such a catastrophic situation in the years to come.

Dr. R.V. Verma, Director, Institute for Regional Development Studies, India, 075

I love your intent, but the alternatives you're offering in your checklists are either pie-in-the-sky, given current and looming shortages of oil and other resources, or entirely inadequate to the necessity of stopping the industrial machine and drastically lowering GDP, which is the surest predictor of CO₂ output. Climate change, peak oil, deforestation, poverty, over-crowding -- these are all SYMPTOMS -- the PROBLEM (as Bill Rees doubtless said when he spoke) is human overshoot. We won't improve the situation by addressing symptoms. Human impact on the planet is dictated by (over) population and (over) consumption, multiplied -- not ameliorated -- by the use of technology. The only real solution at this late stage is less -- less human population, less consumption of resources. We have to get back under the limit of what our habitat can sustain, which is at least 50% less than we're currently using, and we have to do it before the permafrost and the methane hydrates and the peat bogs start an irreversible melting that leads to runaway global warming -- if in fact there's still time to do that. If you want to change the minds of others, you will first have to change your own, and make your solutions consistent with the reality of the problems you know exist.

Jon Cooksey, Conductor, How to Boil a Frog, CANADA, E100

Important to integrate development, reduction in waste, pollution and emissions, adaptation to a changing environment. They are mutually supportive not sustainable.

M, London School of Economics, U.K. E155

Environmental protection should be led by the Government and implemented by enterprises through strict relevant standards,

clear penalties, timely news and media supervision.

Nan Ke, CHINA, C160

Nowadays, environmental protection has become a global problem and requires global cooperation. As a student majoring in Finance, I believe that finance can also make a contribution to environmental protection. For example, the existing subject of Carbon Finance appears due to environmental protection, energy conservation and emission reductions. In addition, I have been always interested in this field.

Zhang Sha, Student, Renmin University of China, CHINA, C177

I think the very key issue that needs to be focused upon right now is the issue of ENVIRONMENTAL DEGRADATION. We talked too much on GCC but even in my country issues such as destruction of coral reefs, illegal logging, small scale mining, lack of urban planning are still things only a handful care about. We need to address these issues and at the same time attacking the same issues as GCC. I think we have to refocus our efforts that if we stop environmental degradation and increase our efforts on conservation and management, we'll have a better future ahead.

Ian Joey Tajonera, M&E Specialist, ECOFISH Project, Tetra Tech ARD, PHILIPPINES, E183

It is necessary to actively lead environmental protection and perfect environmental protection systems.

F, CHINA, C198

Environmental protection has already become a major global problem. Many countries and individuals are actively taking steps for environmental protection. However, what they can truly do is limited. Earthquakes, tsunamis, floods or the previously mentioned End of the World are all caused by environmental changes. We firmly believed in the End of World just because the global environment is rapidly deteriorating. In my opinion, environmental protection can actually be achieved on the premise of not affecting our daily lives. A decrease in the number of vehicles on the roads cannot make the atmospheric environment better because the flowers, plants and trees need to be carried by vehicles. I believe that we can commence environmental protection with ourselves and learn from foreign countries to undertake social work, because we can profoundly understand the importance of environmental protection only by exerting our efforts.

F, CHINA, C200

Everyone must be responsible in protecting the environment. This is where we live.

Nimfa C. Chen, Unit head, Bureau of Plant Industry, Department of Agriculture, PHILIPPINES, E238

The described environmental problems should be seen through the lens of our limits to growth. Where to stop and how to proceed? What would be the consequences if we were delayed in our response? These are the pertinent questions to be asked. There should be widespread education on the consequences of the overshoot in our present material growth. The Science & Technologies, Political will and People's enthusiasm should harmonize well to address the present environmental problems listed out here. The "developed" world must come forward to partner with the "developing" world to choose the path of sustainability equity and inclusiveness in growth.

Nadesa Panicker, Anil Kumar Director, Biodiversity, M S Swaminathan Research Foundation, INDIA, E257

It is important that multiple nations address the problems jointly.

Meng Jianjun, Professor, Center for Industrial Development and Environmental Governance, Tsinghua University, CHINA, C279

Once people are not marginalized, environmental conservation will not seem like a luxury.

F, American City Business Journals, U.S.A., E285

Human attitude to environmental problems: how to change crisis development

M, Immanuel Kant Baltic Federal University, RUSSIA, E309

[Reinforcement of International Environmental Institutions]

UNEP should get much more aggressive and active in countries like this one (Georgia) as well as Africa and Asia. They are passive and make huge salaries. They need to get a grip--they could be the stewards they are meant to be!

Mary Ellen Chatwin, policy advisor, Consultant for several NGOs, GEORGIA, E012

Global governance and agreements. We are witnessing the tragedy of the global commons. We need a radical change of international institutions — including the UNEP, the UNDP, the World Bank, IMF, and more. We can no longer separate environmental problems from economic and finance, from equity, ethics, trade, migration. In 1945, new institutions were created. Now is a time like 1945. Let's start again!

Professor Ian Burton, University of Toronto, Canada, 042

Alignment of global efforts is a must, Organizations such as UN bodies or IUCN ought to be followed for they are truly trendsetters

Ramon Perezgil, President, Faunam, MEXICO, E283

[Waste]

Mankind will inevitably produce rubbish, wastewater and gases for as long as it exists. The environment can maintain a balance when nature is able to digest the rubbish, waste water and gases; otherwise the environment is disrupted. It is therefore essential to strictly control the sources of environmental pollution and develop new technologies to assist nature in digesting the waste in order to achieve a balance between mankind and nature.

F, Ministry of Foreign Affairs, CHINA, C174

Educating the people wherever they are about the importance of keeping the environment clean (clean air), and making sure every region is free from garbage. The most advanced technology of garbage disposal should be made available to every country in the world.

F, Malaysian Meteorological Department, MALAYSIA, E240

With environmental problems going to reach a peak as evident from the present ... situation in many cities of India, an important way to mitigate the problems would be creation of facilities in cities to deal with garbage and wastes, especially plastic waste management and disposal. It is not enough if the garbage is thrown away out of the vicinity of the public (even this is not done at times, and garbage is just disposed of off the road where the stink gets pedestrians irritated!) in some wetland or marshy land or in natural sinks. This greatly harms the ecological functioning of such natural systems; which needs to be taken seriously and acted upon urgently.

F, Central Institute of Fisheries Education, INDIA, E316

[Promotion of Research, Science and Technologies]

1. What plays an important role in our perception of those issues mentioned above is the public media. However, the scientific data must be provided also for us to have sustainable solutions. Therefore research activities are very important to acquire new knowledge, and must be supported.
2. Diverse aspects must be studied and presented. For example, nuclear energy and its security measures must be included in the analysis. The reason is that nuclear energy is not fully discussed as to its dangers and benefits while an eventual solution to the environmental degradation including climate change is mentioned. Detailed scientific results should be presented if available, and more basic researches should be carried out in case we don't master it. In conclusion, I want to emphasize that scientific research must be encouraged to overcome disastrous human errors and prepare adequate solutions.

Min, Dong Pil, REPUBLIC OF KOREA, E003

Responsible Research, Innovation and Development of Bio-Cognitive-Geoengineering-Informative-Nano (BCGIN) Sciences and Technologies (S&T).

Nijaz Deleut, Founder/Manager, Mitigation of Climate Change, NGO ECO CENTER "CHARLES DARWIN" – de leut's environment, CROATIA, E011

Environmental protection and the development of a productive force should promote each other and coordinate with each other. It is necessary to undertake further research into how to deal with the relationship between these two factors, because this is a test of our current policies on environmental protection and the means of economic development.

F, Jiangsu Province, CHINA, C058

Relevant systems and technologies are crucial for environmental management. To be exact, the relevant systems are fundamental and the relevant technologies are crucial.

F, Ningbo Research Institute of Development Planning, CHINA, C071

[Most Critical Environmental Issues]

The dual problems of climate change and population growth pose our biggest challenges.

Alex Wilson, Building Green, Inc., U.S.A., 010

Climate change is clearly a leading issue of our time, with unknown and world changing consequences in store. Biodiversity is high on the list due to very worrying decreases in pollinators for example, on which a large proportion of our food depends. Similarly, unsustainable fisheries policies mean that the world's oceans are on a parallel and worrying downward trend. Both problems are at least partly due to a rapidly growing world population. My comments are my own and do not necessarily represent the view of my employer.

M, Met Office Hadley Centre, U.K., E026

Energy, air and water resources are the most critical issues humans will face in the future. Whether we can properly solve these issues will affect the length of time humans can survive in this environment in the future.

M, Taiwan Mitsubishi Elevator Co., Ltd., TAIWAN, T045

Reasonable control of environmental pollution, waste recycling, etc.

F, Company, CHINA, C062

A major concern is ocean acidification, aside from the other effects of CO₂ emissions. A major priority should be to invest in the full range of social sciences to address how societies and economies can learn to shift to sustainable pathways.

M, Convention on Biological Diversity, CANADA, E118

Water pollution, solid waste management, adult education on planting trees, polythene usage self sufficiency in home gardening, etc.

A.Nandakumar B.V.Sc., SRI LANKA, E130

Urban population, Serious pollution, Insufficient water resources, Green energy development, Paperless office

M, CHINA, C235

In LDC, poverty is the first problem. Many stakeholders are aware of environmental problems and their importance and the population is also sufficiently aware of the environmental issue. But what can they do, think or plan when many people are dying of starvation?

Cheikhna Aidara, Coordonnateur, Association pour la Protection de l'Environnement en Mauritanie (APEM), MAURITANIA, E270

[Pollution]

Air pollution and mortality in elderly people. Air pollution and daily hospital admissions in metropolitan areas.

F, University or research institution, PORTUGAL, E034

It is necessary to develop and apply environment-friendly new energy resources, and establish compulsory laws and regulations on closing those factories and enterprises causing serious environmental pollution. It is necessary to close all the enterprises discharging pollutants secretly instead of merely imposing fines. It is necessary to establish an incentive reporting system, move the chemical and heavy industry enterprises causing serious environmental pollution and achieve sustainable development rather than repeated construction when planning the corresponding cities, build an underground pipe network under centralized management and strengthen the supervisory control of environmental protection.

Guo Bin, Administrative Staff Member, Icon United Architectural, CHINA, C072

The last 3 years, every time we sample and analyse our air and water quality at a local level, we meet more air and water pollutants like ozone, Nox, Sox, Voc", Btex and heavy metals like arsenic, cadmium, lead and other pollutants, so, we are more exposed, these troubles are increasingly and we do not have the appropriate technology to clean and properly dispose of all of them. We are at dangerous exposure level.

Alejandro Molina-Garcia, Vice-Director, Direction of Protection against Sanitarian Risks,

Ministry of Health at Michoacan State, MEXICO, E073

Since the reform and openness to the outside world, the Government has achieved high-speed economic development at the cost of environmental pollution, and as a result, the blue sky and green water have become the blue water and green sky, and people do not know to protect the environment. These are the fundamental reasons why China has suffered worsening environmental pollution for more than 30 years. The appearance and development of cities has colored China, and the high-speed economic development has concealed the high temperatures in the cities caused by limestone, the dust all over the sky from the construction sites, and the noise of trains roaring past. Villages were originally the simplest holy places, but farmers apply excessive pesticides to achieve high yields, and as a result, river and well water has become seriously polluted and the villages are facing tragedy. Acid rain has aggravated environmental pollution, water and soil loss has caused desertification, the grasslands and meadows have deteriorated, and biodiversity has decreased. All in all, the ecological environment has been disrupted. All this means that mankind has been on the brink of causing itself ruin, and is finally experiencing the terrible consequences of environmental pollution, just as with opium smoking in the past. Industrial civilization has resulted in large-scale machine production, and the latter has caused the emission of gases such as nitric oxide and sulfur dioxide generated by automobiles and power plants, while these gases have produced acid rain and thus caused environmental pollution and resulted in people becoming easily infected with organic diseases. Millions of kinds of chemical compounds caused by chemical pollution exist in the air, soil, water, plants, animals and human bodies, while the disordered expansion of these large cities that

are characterized by being crowded, polluted, having poor sanitary conditions and no sense of safety also affect nature by causing serious radiation to living beings. As citizens, we need to protect our environment step by step. As a country, China should not only provide significant support for environmental protection in respect of policies, but should also provide its citizens with education on environmental protection so that each citizen can voluntarily take good care of the environment.

M, Hainan Radio & TV University, CHINA, C109

The focal points of environmental protection are control and prevention. Only by doing both these things at the same time can environmental pollution be mitigated and environmental quality be further improved.

F, Beijing Hupu Sports Cultural Development Co., Ltd., CHINA, C132

It is necessary to strengthen the penalties for enterprises or individuals causing environmental pollution.

F, Environmental Protection Bureau of Hengshui City, CHINA, C182

Poverty, growing population and rapid development (especially in the areas of Agriculture and large scale mining) are the drivers of environmental degradation in Sierra Leone. Unless the costs of pollution prevention are internalized there is a growing fear that water pollution will reverse the development the country is making.

Dr. Kolleh Alusine Bangura, Director, Environment Protection Agency Sierra Leone, SIERRA LEONE, E201

[Biodiversity]

Despite rhetoric at COP10 et cetera, environmental policy remains silo-ized and not integrated with overall policy and societal decision-making. This leads to contradictory, nonsensical policy and gets us nowhere! Until sustainability and coexistence with other species becomes priority #1, our environmental problems will not be solved

F, Journalist, Japan, 067

Loss of biodiversity can be summarized in a word, "HIPPOG." Destruction of Habitat, growth of Invasive species, Pollution, Population growth, Overuse of resources, Global warming.

Dr. S.K. Shringi, India, 083

Please, try to align the categories of environmental issues of greatest concern with the Aichi targets of the Convention on Biological Diversity. Many of the categories could be linked to those targets.

F, International Union for Conservation of Nature, SWITZERLAND, E164

In the end environmental stresses should be reduced and managed to maximize the planet's biodiversity ...that will mean addressing all major environmental problems

Thomas Lovejoy, University Professor, GeorgeMason University, U.S.A., E308

Developmental activities must have an ecological approach. Environment must not be compromised for development. Depletion of local indigenous plant and animal species is a great global loss that can be reduced if only local people are involved.

Sundara Narayana Patro, Working President, Orissa Environmental Society, India, E310

[Ocean and Water]

Safe water is the most important environmental problems. Seawater should be brought into the land by concrete or high-density PVC pipes. Seawater ponds and lagoons must be created world over for people to fetch and distill in their homes to get safe water. Where distillation is difficult, organic purification must be done with easily available kitchen utensils. The Ryan Foundation method is enclosed. Each family can easily purify about 20 liters of ground or tap water every day.

Dr. Felix Ryan, U.N. Global 500 Environmentalist, India, 035

As an advocate for fresh water and the ocean, I am pleased to see your focus on the mega-cities around the world, most of which are located on major rivers and the coasts, which contain the highest density of population, demonstrate the most exaggerated consequences of failed environmental policy, and are the primary locus for solutions. The current emphasis on marine protected areas is welcome, but it is the values and behaviors evinced by the cities that are the primary locus of the most critical problems and, therefore, that are the necessary focus for change. The global environmental movement has failed to penetrate public awareness through communication, outreach and education to the extent required to transform past actions into political will for change. This is particularly true with fresh water and the ocean where the continuity of the water cycle, ocean distribution system, and necessary sustainability of supply are essential for human survival. Nor has the movement demonstrated its own awareness of the integrated relationship between destruction of the earth's natural systems and its consequential impact on climate, biodiversity food, energy, health, security, trade, transportation, finance, policy, governance, economic development, and cultural identity. This is a failure of values, concept, action, and communication. We have little

to be proud of and much work to do.

Peter Neill, Director, World Ocean Observatory, U.S.A., E123

We are facing a fresh water crisis in our country. Rain Water Harvesting needs to be implemented as a policy and made mandatory across the country to help ourselves.

Marianne, Former Asst Editor, Environment and science, Freelance, INDIA, E157

Urban water pollution and contamination in mining regions and emerging industrialised cities

Freddie Sayi, Project Manager, WWF Zambia, ZAMBIA, E196

I am concerned about the indiscriminate use of our water bodies as dumping grounds for raw sewage and plastic accumulation in river bodies. There should be a very strict implementation of rules and regulations, which are not of great concern to most of the Government organisations. We have got to stop now or it will be too late. The next world war will be for drinking water.

Savita Kerkar, Associate Professor, Biotechnology, Goa University, INDIA, E237

It is necessary to strengthen the detection and management of groundwater.

M, Handan Bureau of Housing and Urban-Rural Development, CHINA, C272

Being a Water Engineer in my region, I am highly concerned with the water resources system and climate change's impact on it. Most of the rivers in Nepal (especially in the Himalayan region) are being depleted at an unexpected rate, which leads to scarcity of flow for irrigation, drinking water supply and hydropower generation. The reason behind this is inadequate study of those inaccessible regions. I would like to emphasize the necessity of proper research on those areas.

Sunal Ojha, Water Engineer, Nepal Electricity Authority, Ministry of Energy, NEPAL, E311

[Population]

World religions need to stop encouraging their adherents to have many children - particularly the Catholic Church and the Islamic faith.

David Vernon, CEO, Stringybark Publishing, AUSTRALIA, E004

No solution to significant issues without aggressive addressing of human population growth. We are already beyond reasonable carrying capacity for the planet.

Kent H. Blacklidge, Ph.D., Writer, U.S.A., 008

Baby bust and population aging trigger negative impacts. The government should put forth effective policies.

F, De Lin Institution of Technology, TAIWAN, T019

The key issue is population. Unless human numbers decrease, there is no remediation or mitigation possible.

Every "life impediment" stems from too many people chasing diminishing resources. There is little long-term future for humans and biodiversity unless we reduce population. It's so obvious that it's obscene so few people want to even address the issue. I attended a Zero Population Growth Conference in Cape Town in early 1970s when people reflected on this seriously and presciently. Since then, it has been rhetoric and obfuscation on a global scale. As a biologist, active in Africa and South America, I am very pessimistic about the future of my "grandchildren's generation" and fear it will be globally basic if survivable. I completed the first survey of yours as an optimist, became a pessimistic optimist, and now find myself years later a realist pessimist. Perhaps the next step will just be pessimist!

Professor Charles Stirton, Honorary Research Associate, University of Cape Town, U.K., 045

Population stabilization will not, by itself, solve anything; but it is an essential pre-condition for solving everything else, and achieving bio-physical sustainability. It is also the most widely (and irrationally) ignored of all the major environmental problems; yet it is the multiplier, with rising resource consumption, of all those problems.

Roger Martin, Chairman, Population Matters, U.K., E052

The main problem is over population and so there should be more education on this topic and contraception.

F, international otter survival fund, SCOTLAND, E068

The human species is in overshoot on Earth. Climate change will reduce food supplies. Many people will starve. For much too long, it has been taboo to address overpopulation, which guarantees appalling hardship and environmental degradation in the future.

J. Anthony Cassils, retired, CANADA, E072

The root cause of our environmental and economic problems is population. There are 5-10 times as many people on the earth as it can support in a sustainable manner. We must recognize this problem and take action to begin to resolve it.

Ken Schultz, Manager, Energy Group, General Atomics – retired, U.S.A., E275

The only way we can hope to limit the impact of humans on this Planet is by limiting our numbers. If we do not take steps to do this, Nature, in her wisdom, will do it for us. Human overpopulation is the number one cause of all our environmental woes today.

Jennifer Kirkpatrick, U.S.A., E302

[Reduce Consumption]

In the last 40 years the population has doubled, but world trade became 200 times bigger than in 1970. It means that if we were able to reduce our consumption, and use local resources, we should help our Earth a lot.

Judith MOLNR, president, wood processing, ARBOR Entrepreneurs Association, ROMANIA, E035

There are too many people, too much “mindless” consumption, too much greed. So far as we know, we only have this one habitable planet, We destroy it at our peril. If we set aside our constant desire for more “stuff” we could work together and have a healthy environment, good lifestyles for all Earth’s inhabitants (people, animals, and plants), and still develop and grow our cultural and economy sustainably.

Eleanor K. Sommer, Editor and Journalist, U.S.A., 058

An important element in changing the course of our common future will be educating people to consume less and consume more responsibly. Currently, governments in conjunction with the private sector continue to believe in and support policies that spur unbridled consumption of consumer goods that are produced with high environmental and climate impacts, transported all around the world, and rapidly become garbage. A shift through education and smart governmental policies is both possible and wise. The world can also do this without the effect being a punishment or deprivation for society, rather an enhancement in the quality of what we have and how we live.

Ana Maria Klymeyer, Founder, Instruments for Change, SWITZERLAND, E074

Consumerism is a profound factor that causes heavy demand in the process of urbanization so that both production and abandonment produce an environmental impact. It is therefore vital to urgently advocate sustainable consumption and power-capital consumerism. In recent years, people’s consumerism-driven excessive pursuit of commodities and money has had an adverse effect on society. The expansion of consumerism causes people to be controlled by commodities and even to become the slaves of commodities. Urban people in China are paying more and more attention to enjoyment and making money, but are ignoring moral integrity, character and the cultivation of a philosophy guiding people’s integrated development. As a result, people’s moral standards have gradually declined, people’s intelligence has also degenerated and people’s comprehensive quality has become poorer. The cultural products of mass production based on consumerism will ultimately cause vulgar and unsophisticated cultural transmission and thus the transformation of an elite culture and a high culture formed in traditional times into a superficial culture. One scholar thinks that the era of consumerism is an era without masterpieces and classics (Yao Dengquan, in 2004). In China, consumers excessively pursuing fashion will be a dreadful force that will blindly drive environmental disruption if they have no corresponding information and consciousness. China has a population of 1.3 billion. Even a very small problem becomes a major problem once it is multiplied by 1.3 billion; even very considerable financial and material resources amount to a very low level per capita once they are divided by 1.3 billion. We clearly understand that the change in the consumption patterns of China with rapid economic development has a special meaning for China and the world due to the large population. Moreover, from macroscopic and theoretical perspectives, the existing common view of China’s decision-making level is clear, namely to build a conservation-minded society. In the long run, the successful implementation of such strategic thinking will make an immeasurably great contribution to mankind. However, my observations suggest that it is perhaps too optimistic to think we can put such an idea into practice and achieve the anticipated effect. Foreign countries have increased their attention to changes in China’s consumption modes in recent years. For example, Karl Gerth, a historian on modern Asian from the University of Oxford, believes that China supports American consumerism, and that this is an important phenomenon deserving the most attention from people and that will affect all aspects of human life and even change the world. He points out that the world should pay attention to Chinese choices in daily consumption. Even subtle changes in Chinese consumption produce bigger and more profound effects on the world than the military expenditure budget, carbon emissions, trade disputes and other items. In China, the majority of people have just solved the problem of food and clothing, while a minority are living a luxurious life; in the world, the wide gap between the levels of per capita shared resources between developed and developing countries has not narrowed. This pattern means considerable complexity and difficulties, but we still firmly believe that sustainable consumption should be a confident choice for the Government of China and all sectors of society, and we also firmly believe that a necessary condition of China’s sustainable development is to resist and prevent consumerism from spreading unchecked.

*Zhang Boju, Master’s Degree Candidate, Department of Government & Public Administration,
Chinese University of Hong Kong, CHINA, C176*

The emerging environmental issues are increasing at an alarming rate despite the fact that governments are aware of it. The materialistic lust among the human population is growing stronger and stronger day by day and the consequences of such greed will hurt the most vulnerable people first. Let us not just think sensibly but act diligently.

Dago Tshering, Researcher, Research Program, Royal Society for Protection of Nature, BHUTAN, E186

I think that it will be critical to control consumption levels of critical elements such as water, fossil fuels and food. If we do not tackle the issue of consumption anything else will become marginal to any effort to improve the environmental situation at the global scale.

Marcos Antonio Pedlowski, Associate Professor; Leea, Universidade Estadual Do Norte Fluminense, BRAZIL, E216

[Environmental Awareness and Education]

Mother Nature makes every effort to provide human beings with enough substance to live on, but, we, human beings, do not make any contribution to Mother Nature. People's greed results in destruction of the global environment. Hence, the only way to improve the current trend is to reform people's hearts. I hope that everyone will have religious faith. In other words, promotion of religious faith means implementation of an education of the soul.

Liu Ju-Song, Planning Section / Technical specialist, Environmental Protection Bureau,

Taoyuan County Government, TAIWAN, T005

It is essential to improve people's awareness of environmental protection, and to supervise and urge everyone to protect the environment, and strengthen punitive measures.

Zhao Yuanyuan, Student, Graduate School, Party School of the Central Committee of C.P.C., CHINA, C010

Promotion of environmental awareness and environmental education is a critical issue. The government should enact relevant laws and policies.

M, National Taitung University, TAIWAN, T020

It is important to ensure that the public has an awareness of environmental protection, improves this awareness and transforms it into behavioral habits.

F, University, CHINA, C023

Rather than being a technical issue, the Earth's environmental problem is more of an issue of the determination to find a solution, as well as a problem of resource distribution. Currently, many resources are being wasted, and many kinds of pollution and destructive conduct are being permitted or ignored. The core reasons are incompetence and lack of determination to find solutions to such issues by government agencies. In such circumstances, elevation of public consciousness is crucial. Environmental education and family education must start from elementary school students. Only by changing people's fundamental concept's can people's behavior possibly be changed.

M, Kaohsiung Wild Bird Society, TAIWAN, T024

Education and empowerment for girls and women is a key to improving almost every problem we face, whether it be population, environmental issues, democratic participation in daily life.

F, Independent researcher, FRANCE, E027

Environmental problems are the dynamic outcome of a population explosion in the framework of the western model of production and consumption, exponentially increased by an inflexible human mindset in combination with the planet's given biodiversity limits, all to support a "wanna be" human environment. The whole system has been dramatically promoted by a few pragmatic people and any proposed solution faces narrow-minded resistance by a very few greedy very short-sighted fossil fuel producers backed by a lesser number of advertising companies and media owners. And here we are some 15-20 years before an unprecedented tipping point for nature's ensemble and at the same time before the next life evolution stage with human beings not necessarily included - at least in the form and content we are aware of. Lack of Crisis/change management initiatives, human mindset change, intensive training and green movement green fatigue and ineffectiveness worsen the situation dramatically.

Andreopoulos Andreas, Founding president, Awareness, Access to information, communication, Metis Global Awareness Network, GREECE, E028

Government agencies and the general public place a higher value on economic development than they do on the Earth's environmental problems. Depletion of environmental resources will eventually affect human development, existence and sustainability. Environmental pollution and destruction will ruin the fruits of our economic development. However, people still refuse to believe it. Such shortsighted and ignorant attitudes need to be changed.

F, Conservation Mothers Foundation, TAIWAN, T031

Though the environmental problem is significant, it is not discussed well in public education, . People's awareness of environmental issues is very important.

F, Korea Christian University, REPUBLIC OF KOREA, K035

There must be some way of placing environmental education as priority #1 in all political discussions.

Phillip H. Colman, Australian Museum (Retired), Australia, 037

Enhancement of environmental education to raise awareness of environmental problems

M, Eco Children Center, REPUBLIC OF KOREA, K038

The convenience pursued by modern people has resulted in environmental pollution that is now striking back at humans. Thus, we should educate and teach humans to be aware of the problems associated with environmental pollution. Otherwise, convenience, advancement and quick development can only deplete the Earth's natural resources.

F, Natural Beauty Fuli Cosmetics Co., Ltd., TAIWAN, T040

I personally believe that it is very important to lay a solid foundation through education. Environmental protection can only be thoroughly executed by conjoining fundamental education with publicity and promotion from the government, private organizations and enterprises. However, what's most important is that no person, business, or governmental unit should ignore the earth's thorny problems due to "other benefits".

M, Daan Construction Enterprise Co., Ltd., TAIWAN, T048

To date, our country's attitude toward environmental protection has been positive and relevant policies have been formulated, but local governments have not implemented these policies. In my opinion, it is necessary to integrate education on environmental protection with current education, and commence this work with children.

F, Jiangsu Province, CHINA, C055

Education is crucial. To be exact, it is necessary to instill an awareness of environmental protection into everyone from childhood, to teach environmental protection by personal example as well as verbal instruction, implement textbook reform, and improve everyone's quality by taking environmental protection as a compulsory course. Only in this way can everyone form the habit of environmental protection, create conditions for the ideal environment, purify the earth and protect the ecological environment!

F, Beijing Quanlin Bense Paper-making Co., Ltd., CHINA, C057

Environmental education should be taken as a prime mission and involve common people in to this.

Rajeev Kumar Singh, Research Scholar, Geophysics,

Banaras Hindu University, varanasi, U.P., INDIA, INDIA, E063

It is necessary to popularize knowledge of environmental protection, and make people understand the consequences of a worsening environment and the influence on later generations and gain an awareness of the urgency of environmental protection!

Xu Yahoo, Online Store Operation Promotion Specialist, Wenzhou Hongrili Footwear Co., Ltd., CHINA, C063

Education shall be the top priority, followed by environmental improvement. Only through our next generation's awareness regarding environmental protection can the promotion of environmental protection and education publicities be effectively carried out.

M, Environmental Protection Bureau, Changhua County, TAIWAN, T064

It is necessary to actively improve the awareness of public environmental protection and carry out relevant activities in many ways, and to coordinate the public environment with sustainable economic development.

F, CHINA, C066

I feel education on these matters is particularly important. If the urban population can only be brought to realize the dangers, everything else should follow. There seems to have been no mention of any possibilities of global population limitation.

David Keith Butt, Reader in Physics (Retired), University of London, U.K., 072

It is very urgent to educate young people and to organize them in order to give a warning signal to all people around the world. Thank you for your efforts.

Ock-Hyen Kim, Director, Daejajon, South Korea, 077

It is necessary to form good living habits and an awareness of environmental protection from childhood because the environmental issues can be solved fundamentally in this way.

F, Hainan Province, CHINA, C165

The public should strengthen the understanding of environmental issues from macroscopic and microscopic viewpoints and strengthen the awareness of self-input. In addition, education on environmental protection should start with children.

F, Beijing Forestry University, CHINA, C190 C158

The leading factor causing the environmental issues is mankind. I believe that it is necessary to strengthen education on environmental protection. We must put the modification and formulation of relevant laws and regulations on the agenda if we intend to obtain an instant effect. However, the most important thing is that every citizen should voluntarily foster his or her awareness of environmental protection.

M, China Sports Publication Corporation, CHINA, C204

We at the Global Peace Initiative of Women strongly believe that a complete shift in consciousness is needed for us to have hope of saving our fragile planet and her living systems. It is necessary to awaken the hearts of everyone to a new way of regarding life, not from the standpoint of 'I' but now to 'we'. We are all an interconnected part of this living web of life, and if we can understand this from the depths of our hearts then we can inject love into all our actions, into business, education, environmental work and life can again become sacred. We would understand that anything we do to harm our earth or others is in fact harming ourselves. Technological measures will not be enough. Technology and cleverness and rational thinking have contributed to the mess we find ourselves. No energy saving gadgets or systems will be enough if there is not the power of love behind them. If we can think of the earth as having a spirit and a soul, then we would show care, gratitude and love for her. It is as if our mother were in a hospital, dying, the doctors try every new medicine to treat her, every advanced surgical technique but when it is the soul that is dying then no amount of chemotherapy will help the physical. But nourishing the soul can heal. How do we awaken humanity is a key question. A shift in our economic systems is imperative. In the words of Charles Eisenstein from his book "Sacred Economics", "If we want to outlast the multiple crises unfolding today, let us not seek to survive them. That is the mind-set of separation; that is resistance, clinging to a dying past. Instead, let us shift our perspective toward reunion and think in terms of what we can give. What can we each contribute to a more beautiful world? That is our only responsibility and our only security." Are we so broken that we would aspire to anything less than a sacred world? Life will then give us the answers we need and the systems for living in harmony with the earth will emerge.

Marianne Marstrand, Executive Director, Main The Global Peace Initiative of Women, U.S.A., E226

Every adult should receive an education in environmental protection.

M, CHINA, C231

I always believe that we necessarily have to start with education on environmental issues so that everyone in their individual capacity can begin to act appropriately, to avoid any actions that could lead to negative effects on the environment. The reason being that organisations or communities are made up of individuals who are the ones responsible for taking action in whatever capacity or role.

Benson N. Modie, Managing Director, The Centre for Knowledge, BOTSWANA, E245

Environmental education related to extreme poverty

F, Ministerio de Ambiente y Recursos Naturales, GUATEMALA, E298

Education and environmental awareness are in my opinion among the most important issues.

F, Bund für Umwelt und Naturschutz Deutschland, GERMANY, E312

[Environment and Economy]

It is necessary to implement the development pattern of "Green GDP" in a practical manner.

M, School, CHINA, C017

There is a major need to promote discussion of the steady state economy alternative to today's endless economic growth system.

027

Even though technology is relatively advanced nowadays, energy efficient, pollution-free technology is still not very prevalent. Other than the fact that this kind of technology is more complicated, eco-friendly and energy efficient products are more expensive than general products, the main reason for them being less popular. Nevertheless, in order to improve the environment, the general public shall accept and commonly adopt eco-friendly products first, instead of relying on enterprises or the government to adopt them in their facilities.

F, Zhi Sheng Geographic Technology and Consultant Co., Ltd., TAIWAN, T034

Yesterday, we voted in a majority liberal provincial government who focused totally on jobs and economy with secondary focus on family and environment. We are pressured by federal government and industry that the economy is the most important to deal with, world economic crisis — because of that, our natural resources are promoted for development — tar sands, petroleum, pipe lines, tankers, liquid natural gas, fracking, overuse of our water and pollution for these developments, mining

forestry, coal — all to be sold to China and elsewhere for the sake of the economy and jobs. Time will tell if and how the environment, our land, our water, oceans will suffer — or will the governing bodies implement “sustainable living practices?”

F, Canada, 053

The Earth’s environment is often sacrificed for short-term economic benefits. However, restoring or returning the old environment requires even greater costs. Hence, we shall strictly examine the impact of various product manufacturing processes on the environment, and the seller should pay an environmental restoration fee (the fee will often be transferred to consumers, so environmental education and promotion should be undertaken, while urging manufacturers to develop green energy, research green technology and come up with green products, as all these are linked together and affect each other).

M, Bureau of Environmental Protection, Keelung City, TAIWAN, T076

The process should illuminate sustainable development goals in a sustainable green economy.

George Kiritu, Programs Manager, YMCA Kenya, Kenya, 089

The settlement of environmental issues should be based on economic incentives, because pure education in environmental protection is necessary but its impact is limited.

M, Renmin University of China, CHINA, C169

It is necessary to strengthen the promotion of various energy-saving environment-friendly products and accelerate the popularization of new energy vehicles such as electric and solar powered cars.

F, Renmin University of China, CHINA, C170

Unless we address the rampant inequality in the world and the fact that most resources, technology, information etc. remain under the control of those corporations and nations who have most benefit from continuing the exploitative and unsustainable (and collapsing!) system in existence, nothing much will have a chance of dramatically changing all or any of the issues this questionnaire addresses. None of the energy “producing” corporations have done anything, really, to withdraw from exploitation of the damaging fossil fuels resources; to the contrary, fracking and biofuels have so many negative effects - especially biofuels plantations which rob subsistence land from farmers who then have to leave their rural areas and add to the city populations in search of jobs... the criminal involvements of mining corporations in stealing the land from peasants, aided and abetted by national governments who are forced to engage in this because the IMF, World Bank and WTO force them to do so... Again, unless we start to address these issues, nothing will change, really... and the only way I see that a solution could be found is by developing resistance and alternatives from below.

Jacques Boulet, Director, Borderlands Cooperative, AUSTRALIA, E174

It is necessary to implement a zero-tolerance policy for enterprises polluting the environment or organizations breaking the law. The high fines force these enterprises or organizations to go bankrupt, while they must pay a large amount of compensation for the accumulated consequence of years of pollution and are not permitted to engage in the relevant industries afterwards.

F, CHINA, C210

It is necessary to take strict improvement measures for chemical enterprises causing serious environmental pollution. It is not sufficient to only impose fines. If necessary, it is essential to order the enterprises causing environmental pollution due to secret and chaotic emissions to cease undertaking business for rectification, or to close and halt production.

F, CHINA, C215

We need green technology and must give incentives to promote them.

F, Open University of Sri Lanka, SRI LANKA, E229

Environmental problems: so much proclaimed, so little acted

Since the UN Conference on Human Environment in 1972 in Stockholm (Sweden) not a day passes without some reference to the vicious spiral between poverty and environmental degradation, one accentuating the other in a mutually reinforcing manner. The Report to the World Commission on Sustainable Development or the Brundtland Commission Report Our Common Future (1987) brings out that notwithstanding the geo-political boundaries of the nations of the world, the destiny of all humans on planet Earth is ecologically entwined. It also points out the growing intra and inter-generational inequities. The Rio-1992 conference (UN Conference on Environment and Development held in 1992 in Rio de Janeiro Brazil developed Agenda 21 to operationalise the sustainable development. And twenty years later, Rio +20 acknowledged that since Rio-1992 economic growth has received far greater attention than the environmental and social dimensions. Consequently, there is no noteworthy progress on sustainable development and conservation of biodiversity. This is really a significant observation since sustainable development has essentially three equally important dimensions, viz. environmental, social and economic. Rio+20 also recognized the fact that human endeavours at present are not adequately focused to keep the average global temperature

below 2°C. The point is that if the present rise of 0.80°C in the average global temperature goes on increasing to about 2°C, a tipping point is inevitable. Once the tipping point is reached human adaptation to drastically altered patterns of rainfall, ecosystem function crop productivity, emergence of new pests and diseases, and resources availability etc. would be different from the present and as yet unforeseen. So, the prudent thing is to delay the onset of the tipping point as long as possible. It is easier said than achieved.

So long as the global economy is fossil energy – based industrial growth, (brown economy) there will only be competition in trade under globalization. The Rio+20 has, of course recommended a shift from brown to green economy based more on biologically than chemically derived inputs e.g. biomass biofertilizers biopesticides etc. This is an acceptable pathway to achieve a reduction in the scale of depletion and degradation of the remaining finite resources, reduction in the emission of green house gases, and also enhanced conservation. When it comes to the developing world the social and ecological dimensions require much greater attention. With huge populations and subsistence agriculture the degradation of rural livelihood is often the major cause of poverty and hunger. Many international organizations as well as the policy makers of most national governments advocate rapid industrialization as the way forward to achieve poverty reduction. But industries run with the help of technologies require huge amounts of energy and other natural (raw materials) resources. With peak oil point, peak fresh water point, and global warming in mind the cultivation of crops for biofuels has increased food prices on one hand, and conversion of forest areas for fuel crops cultivation on the other. In this case biofuels, which in one sense could be justified as an ally of the green economy, actually causes more harm to biodiversity and to poorer sections of the population by causing steep rises in the cost of food including staple food grains. Do we feed hungry people or hungry automobiles?

In order to fight the impoverishment of rural livelihoods in populous developing countries a major strategy is to develop on-farm and non-farm ecoenterprises using eco-technologies. Ecotechnologies are the result of blending a frontier technology with traditional knowledge and ecological prudence of the rural and tribal communities so that these acquire a pro-nature pro-poor and pro-women orientation. Given necessary training, initial resources and capacity, the rural women and men organize themselves into self-help groups and undertake one or more ecoenterprises, which may be farm or non-farm, based. There are hundreds of such ecoenterprises but to mention just a few:

- Mushroom production in huts by landless women using paddy husk as substrate
- Making paper and board from agricultural waste by landless women
- Production of biopesticide *Trichogramma chilonis* (a tiny wasp that parasitizes the eggs of cotton bollworm *Helicoverpa armigera*) cards by resource-poor landless rural women.

The point is that the production system in these cases is production by masses as is the case with India's milk production. India today produces about 121 million tonnes of milk annually providing a livelihood to over 80 million rural women and men. The USA produces about 90 million tonnes of milk annually using just about one hundred thousand men. This mass production system using high-level technology employs fewer people, and displaces the work force. There is now growing unemployment in several countries of the European Union. The question is whether advances in technology with ever-depleting finite natural resources can help in job-led economic growth. Rising unemployment invariably leads to hunger and malnutrition. Does this not mean that addiction to economic growth driven by technologies without putting ecology and social welfare at the very top would lead to an eventual collapse sooner than later?

If Rio 1992 has not yielded the expected results, namely sustainable development, the Rio+20 is not expected to achieve it either so long the goal is not to confine the economic growth within the limits of resources and with a view to achieving social gender and economic equities. The nations need to focus on Gross National Happiness (GNH) rather than on Gross National Product (GNP). What is needed is ecological economics with goals of resource conservation and biohappiness and not trade for greed. In the current geological epoch of Anthropocene human activities are pushing crucial global ecosystem functions past a dangerous threshold beyond which the earth might well encounter abrupt highly non-linear and potentially devastating consequences for humanity and all other living species. So we must have more concern for ecology and containment of climate change than on accelerated economic growth and greed.

M.S. Swaminathan, Emeritus Chairman, Agriculture, M.S. Swaminathan Research Foundation, TAMIL NADU, E277

I see the need for innovation. To achieve this will require both top-down regulations and bottom-up markets for green products and solutions. Internalising environmental externalities is the only way the markets can properly respond. Regulations should not be prescriptive, but rather setting the rules for a fair market place; e.g. encouraging development in all scales from small to large, without favouring the larger players through tax incentives etc.

M, IASS, GERMANY, E280

The main problem in my eyes is the irresistible growing economic profit maximisation. There is more need for qualitative and fair increase of economical growth in consideration of environment and human being altogether.

Regula, CEO, ADES Association pour le Développement, SWITZERLAND, E287

[Government and Politics]

Even though there are many social groups advocating environment-related issues, our country's leaders and government officers never value these issues. As long as there are no monetary benefits and no relation to their lives, environmental problems will never be solved.

Qiu Guo-Yuan, Research Center for New Generation Photovoltaics /Postdoctoral researcher, National Central University, TAIWAN, T011

Regulation is only the first step: it is no use unless backed by policing by non-corruptible officials and punitive sanctions that are meaningful.

Dr. Diane Wiesner, Principal, Science Plus, Australia, 030

The Ministry of Environment has a significant regulatory role. But MoE has been taking charge of the environmental industry. Even though "eco-friendly" products are everywhere, it is hard to find a real one. The MoE should be back to its own position to regulate company and protect environment.

M, REPUBLIC OF KOREA, K040

The government shall specifically define the responsible authorities and stipulate punishments for environmental destruction and pollution caused by the commercial and industrial sectors. The punishment should avoid being painless and pointless for violators. The general public shall comply with the government's regulations, even if such regulations may cause inconvenience. Regarding those living habits that may directly/indirectly damage and cause pollution to our environment, the government should set up a well-rounded policy for the general public to follow.

He Ren-You, Engineering Department / Engineer, Digital Technology Co., Ltd., TAIWAN, T049

Today, I worry about the corruption of those in places of power in many countries. There is no environmental awareness in the governments, and the world is deteriorating day after day: clear cutting, desertification, poverty, the lack of potable water, et cetera.

F, Western Europe, 055

Political will is very important.

F, Forest Research Institute Malaysia, MALAYSIA, E064

At present, our country's economy is achieving steady growth. However, environmental protection and humanistic society have suffered a recession while the Government focuses on economic development. I think that the Government's supervisory control is ineffective. I believe that China can make a significant contribution to the environment on such a large piece of land if the Government focuses on the environmental economy and strengthens the awareness of environmental protection. With regard to environment-friendly electric appliances and products, a virtuous cycle will appear if the money saved after environmental improvement is achieved is added to the government subsidies for utilizing the promotion of resources for the second time. I hope that my humble opinions above can be taken into consideration.

CHINA, C064

The Government should allow non-governmental organizations to participate in environmental protection and provide the non-governmental environmental protection organizations with support in respect of laws, funds and technologies.

M, CHINA, C078

Political measures are also one of critical indicators on environmental concerns.

Yogendra Chitrkar, Director, Environment and Conservation, Environmental Camps for Conservation Awareness (ECCA), NEPAL, E119

Environmental protection is not only a future matter, but also an urgent matter. Many people are too busy toiling for bread to consider environmental protection, which is impalpable and out of their reach, but it can be achieved through our joint efforts. The Government and public organizations should consider how to effectively integrate the two things, that is to say, understand the current benefits of both respecting and achieving environmental protection.

F, Jiangsu Province, CHINA, C134

The Government needs to play a key role in the direction of environmental protection. To be precise, it is necessary to focus on preventative management instead of management after environmental issues appear.

M, CHINA, C157

I follow the work of UNEP and UN-Habitat in Nairobi. Member States Reps are kind people willing to do the best. But there is no political will from their respective governments. Action must be taken at the governments' level by lobbying and advo-

cacy. Politicians will move if there is a pressure from the ground level, from people who suffer. This is why I think and work for more awareness and education.

Etienne Triaille, Spiritual advisor, Africa, Pax Romana, KENYA, E159

It is crucial to deal appropriately with the relationship between development and the environment, and the Government plays the most crucial role in this issue.

Li Yulong, Lawyer, Jiangsu Zhongyi Law Firm, CHINA, C162

It is more crucial for the Government to make a choice between immediate and long-term interests. Environmental management can be motivated only after the performance assessment standard is improved.

F, Beijing, CHINA, C166

To date, issues such as environmental pollution have caused very serious consequences. However, the related people or enterprises are generally not penalized or only have to accept less responsibility (relative to the harm). Take food safety as an example: if nobody dies from eating the food, the related people or enterprises are not afraid of toxic food because they know that if they are exposed, they can still continue their business or must pay fines at the worst, and as a result, serious events driven by interests appear one after another. In fact, common people and the media only play a limited role, so the Government should strengthen the relevant laws and regulations as well as supervision and punishment, upgrade malignant food safety events to crimes, and control the situation only by strictly cracking down on such crimes. Otherwise, everyone will suffer harm from toxic food and other environmental issues sooner or later.

M, Chinese Academy of Sciences, CHINA, C171

Both the country and the regions must completely eradicate the behaviors that are causing environmental pollution and resource waste before achieving economic development. Firstly, it is necessary to change the false concepts of political achievement, it should not be permitted to take the GDP as the primary goal when assessing officials' political achievements, and it is necessary to assess the long-term social benefits of their political achievements; secondly, governments at all levels should formulate relevant laws and regulations and strictly crack down on the "evil-minded" who are absolving themselves from environmental pollution in the name of "economic development."

M, CHINA, C181

As China's economy develops, I believe that the existing Environmental Protection Law of the People's Republic of China is causing harm as a result of certain defects. The defective formulation of the existing law has caused the repeated construction of pipe networks in some regions. For example, one company has just dug up a certain road and laid an underground drainage pipeline, and another company has continued digging this road to lay underground optical cables. This situation has not only wasted national resources, but has also caused dust pollution. As a result, our country should formulate a perfect supervision and administration mechanism to avoid problems such as resource wastage, environmental pollution and ecological damage caused by repeated construction due to unclear planning. All in all, work on perfecting the supervision and administration mechanism is imperative.

M, Hainan Province, CHINA, C207

The problem of environmental protection is of great urgency because it concerns the happiness and existence of mankind. Our country has formulated and promulgated some relevant laws and regulations such as the "Environmental Protection Law of the People's Republic of China" and the "Marine Environmental Protection Law of the People's Republic of China." However, I consider that these laws and regulations are not sound and need improvement. In particular, the Government needs to supervise the implementation of these laws and regulations, and individuals and enterprises need to improve their awareness of environmental protection.

M, Hainan Province, CHINA, C208

Schools, colleges and universities should offer practical courses in environmental protection. Governments at all levels should formulate and promulgate detailed and sound regulations on environmental protection and penalization.

F, Local Government, CHINA, C224

It is necessary to change the incentive systems of local governments and incorporate environmental protection into performance assessments.

M, Tsinghua University, CHINA, C262

It is very important to set stringent standards for governments in order to reinforce laws. The first infractor in my country and my city, at least, is the government. They broke every day the law and like citizens we do not have possibility to fight against them. Every step they do is an opportunity for corruption, broke the law and disaster. Probably setting a global government would be the solution for some problems like this, the environmental issues. Thank you for your hard and committed work.

Fabian Carvallo Vargas, Environmental journalist, REMPA, MEXICO, E288

The amount of gas emitted through automobiles in Nigeria is really great. Many vehicles are plying our roads daily over long distances and most of them are too old and they release a lot of gases. Government should improve on our train system where one can travel long distances on train and not on worn out buses as is done today.

Ajigo Abi John, Programme Officer, Projects, Nigerian Environmental Study/Action Team, NEST, NIGERIA, E291

[Urban Rural Environment, Traffic Planning]

You seem to view urban areas as being far more malleable than they really are. You can't just retrofit New York City, or put solar panels on all apartment buildings. Putting high taxes on fuel and cars is wrong and unfairly penalizes the working class and poor. Transportation patterns are set — people use cars because they have to, not for fun. Raising prices will not send them to mass transit, since the trains do not exist.

Roger Witherspoon, U.S.A., 007

The most elegant urban ecology solutions are those that build on, mimic, or work in balance with nature: green roofs, passive solar construction, urban design that promotes walkability, et cetera. More complex technological approaches, such as smart grids or smart roadways, are expensive, remain unproven, and have already produced undesirable side effects — such as public health problems where wireless smart meters have been installed as part of smart grid development. Complex wireless technologies have biological effects, and using them to address urban issues layers another environmental problem into the mix. Focusing on simpler, nature-based appropriate technologies promises to better reduce the overall impacts in urban environments.

F, Journalist, U.S.A., 043

The creation of alternative settlements and opportunities in the rural areas would minimize the feeling that there are only jobs in urban areas. Rural – urban migration would be mitigated.

Shadrack Matuku Musyoka, Monitoring and Evaluation Officer, Catholic Diocese of Kitui, Kenya, 048

The footprint of cities is much larger than their geographical area. Yet the span of governance seldom includes the area on which cities depend and growth often occurs on the best natural resource lands - the reason why the cities were originally successful. The car based design of North American cities has also been a major limiting factor in retro-fitting environmentally sound practices. One can only hope that many developing countries do not choose similar urban patterns and are able to build on best practice - or at least not replicate these errors.

Dr. EDWARD W, TED MANNING, President, Tourisk Incorporated, CANADA, E050

Although not listed as a priority concern, pollution is an extremely serious problem in the urban environment and the solution needs the same actions as those above highlighted.

Angela Wagener, Full Professor, Chemistry, Pontifical Catholic University of Rio de Janeiro, BRAZIL, E053

There are some other factors that should be taken into account in the process of optimization of urban regions, among them - corruption at the administrative level of city governments and prevailing financial interests, and the lack of goodwill of people taking the decisions. Unfortunately, it is extremely hard to make positive changes in countries that suffer from these problems.

Anna Belousova, Leading researcher, Laboratory for Red Data Book, All-Russian Research Institute for Nature Protection, RUSSIA E070

With the high-degree of urbanization around the world, if we can build dimensional habitation and micro habitation in urban spaces, humans and the ecology will be able to co-exist in harmony. This will be an important factor in solving environmental issues.

M, The Society of Wilderness, TAIWAN, T071

It is necessary to pay attention to agricultural and rural development, to understand industrialization and urbanization, to take the road of population shifting to rural areas and to change the pressure of the urban environment.

M, State Ethnic Affairs Commission of the People's Republic of China, CHINA, C143

All the points mentioned in the questions above are important but to give priority to a dynamic planning, implementation and technology application process enables a city to prepare and address problems that will continue to grow.

Feli Visco, Junior Partner, Business Consulting in Sustainabil, Lawma & Visco LLP, INDIA, E145

Urbanization needs to be redirected and reduced.

Earon S. Davis, Adjunct Professor, School of Health Sciences, Kaplan University, U.S.A., E149

Linking cities to their hinterlands and the resource flows from these is essential - see Seitzinger, S. P., Svedin, U., Crumley, C., Steffen, W., Abdullah, S. A., Alfsen, C., Broadgate, W. J., Biermann, F. H. B., Bondre, N. R., Dearing, J. A., Deutsch, L.,

Dhakal, S., Elmqvist, T., Farahbakhshazad, N., Gaffney, O., Haberl, H., Lavorel, S., Mbow, C., McMichael, A. J., Morais, J., Olsson, P., Pinho, P., Seto, K. C., Sinclair, O., Stafford-Smith, M., and Sugar, L. (2012). Planetary stewardship in an urbanising world: beyond city limits. *Ambio* 41, 787-794.

M, CSIRO, AUSTRALIA, E161

A 2007 Column in Traffic Technology International: "INFRASTRUCTURE SOLUTIONS Part I" After concluding, in his last column, that current congestion results from previous century sins (of omission), AI grabs his pad to provide a 'doctorAI' prescription for traffic planning. [Further prescriptions for currently clogged arteries and already arthritic junctions in his next column.] Those who fail to plan are planning to fail. An' that truism was never truer than with traffic congestion. In every city on this globe a new traffic artery is filled to capacity in the first week of its opening. Moreover, from a 'natural monopoly' argument and to facilitate economic development, it is a fundamental function of government to provide free and sufficient transportation infrastructure. Thus, the traffic planning horizon must be not years but decades. An' what form should such planning take? For those willing to learn from history Canada provides examples of both a good principle and of bad planning. In convincing the various British colonies to join in the formation of Canada, Sir John A. Macdonald, acting in close concert with Sir George E. Cartier, promised and delivered a national railway running 'from sea to sea'. Wikipedia reports that, "Macdonald ... saw it as essential to the creation of a unified Canadian nation that would stretch across the continent." And there can be little doubt that he, and the economic agents of the time, understood that to include 'economically united'. The bad example was in Ottawa in the '60's. To prevent "urban sprawl" the politicians, largely by expropriation, created a "Greenbelt" around Ottawa. Residents are happy with convenient 'natural' parkland but the sprawl simply continued beyond the Greenbelt with the only traffic-relevant result being that the average commute is 10 to 20% longer. Not 'learning from history' Portland, Oregon tried similar tactics in the '90's to force people to reside in the ever-denser city core and repeated Ottawa's history. As I was composing this the National Post (founded by Lord Black of Crossharbour!) ran an editorial entitled, "Defending Suburbs". After citing StatsCan data showing faster growth in 'suburbia' than in cities, they summarized the attractions, "Despite lengthening commutes. ... Facilities are newer, family-oriented, big-box" shopping is closer, crime is lower and children's activities are easier to get to. ... And prices are cheaper, not only for homes, but also for groceries and entertainment." The message to traffic planners is clear. In all countries citizens have irrevocably voted (with their dollars, bahts, euros, whichever ...) for the personal freedom of the automobile. Coercion will not 'move' commuters but you can lure some business/commercial interests away from the urban core into satellite centres. Thus the prescription for planning becomes: Start with a publicly declared 'sun & satellites' model and secure the lands now for the traffic arteries and public transit routes which will be built over the next 25 years. And that on a schedule which targets capacities and completion at least eight years ahead of projected traffic volumes. A preceding and a following column are available if you are interested.

Al Gullon, Principal, ACEs, CANADA, E230

There is a looming problem and that is resource shortages, particularly oil. This will make it difficult to alleviate poverty and develop alternative technologies. It may mean cities have to be depopulated and people live closer to food growing regions.

Jenny Goldie, National President, National, Sustainable Population Australia Inc., AUSTRALIA, E239

We need to begin cultivating food in urban settings on a large scale.

Riley Pollom, CANADA, E255

The lessons learnt from addressing issues relating to urban centers in the developed world should be incorporated in the developing of newer urban centers, especially in the developing world. Also there should be some level of technology transfer from developed areas to those now developing so as to avoid unnecessary environmental problems and degradation

M, GUYANA, E260

The government policy that do not comply with the rate growth of population and the growing city and the worst political system does not take into consideration any measurement in developing city. As an example, the transportation system and transportation infrastructure which only give more car's road which use fossil fuel without considering of environmentally mode of transportation. Lack access of housing for the poor, many more malls, shopping centre and big amusement centre being developed to accommodate few population needs instead of the common people to have a decent place to live in and healthy environmental surrounding. Other issue is that clean water supply are being scarce for the poor, and getting more expensive compare to the price enjoyed by the rich who had piping system. The unbalanced and unfairness wealth distribution are getting bigger and this is not healthy for our future generation due to the scarcity in some community and over consumption in the other hand of society. *Tri Mumpuni, Executive Director, Energy, Environment, Education, and Economic Development, IBEKA, INDONESIA, E268*

As said, there is a high potential for greening of cities. Industrial nation's megacities have to show the way out of the over-development vicious circle.

Klaus Riede, Zoological Research Museum Alexander Koenig, GERMANY, E286

Urbanization is playing a huge role in environmental degradation and the global warming crisis. Too many people in one area means greatly increased dependence upon a fragile transportation system and consumption of polluting and non-sustainable fuels to get food and other materials to huge urban areas. Diseases run rampant in crowded areas and even faster in urbanized areas that have not yet had infrastructure set in place to promote hygiene and clean water and foods. In order to mitigate the effect of urbanization upon the environment, governments and other entities must first address the reasons people are crowding into urban areas - lack of economic opportunities in rural areas. Rural economic development with an eye to ecologically and economically sustainable communities is one answer. Providing incentives for people to stay in their communities like enhanced educational opportunities, enhanced communications systems to enable businesses to operate in rural areas, and spreading out clean industries into smaller, more manageable units will also help slow the migrations into cities. We have only to observe the fate of earlier heavily-urbanized civilizations of the past, such as the Hohokam in Arizona, of which only ruins are left to indicate where people were. When resources like water run low, diseases spread rapidly in congested areas and fragile supply lines are cut, the results are devastating. In already-urbanized areas, locally-grown food crops will help reduce the dependence on faraway farms and transportation systems somewhat, as well as ecologically-sustainable construction and retrofitting of structures. Also, sustainable energy production, rigorous recycling of waste products and [in the case of hot climates] building with an eye to providing shade and the reduction of the heat island effect will also help to reduce the negative impact of too many people in tightly-packed urban areas.

Debra Utacia Krol, Freelance Journalist, U.S.A., E293

On the spot involvement using local resources. Too many plans do not involve the people who will benefit from them. Let the local people be involved in what reforms will benefit them. Only that which can be controlled by the users often reaps the best benefit. Modern technology is not always the answer. Intermediate technology and the use of local material and talent will often suffice. To wait for the powers to be to act may be too late. Self action with common guidance may be a better solution.

M, Reiff Research Consulting, U.K., E296

As it stands today urban people are aware of the impact of climate change. What is needed is promotion of mass public awareness among all sections of the society. There is science, technology and money to take corrective steps for management of the environment and natural resources. But the biggest problem is lack of transparency, pursuit of profit attitude, governance deficit syndrome, and trust deficit. The urban poor reside in slums which lack civic amenities and infrastructure leading to poor sanitation and unplanned habitation. The poor in the countryside suffer from poor irrigation facilities and loss of productivity due to climate change impact. A committed governance involving all sections of the society, and visionary environment-friendly approach to development is the answer for sustainable future.

Sundara Narayana Patro, Working President, Environment And Natural Resources, Orissa Environmental Society, INDIA, E310

[Climate Change, Global Warming]

Certain developed countries should keep their respective promises with regard to greenhouse gas emissions.

M, Party School of the Central Committee of C.P.C., CHINA, C014

How to participate in reducing CO₂ emissions in non-industrial section including home.

M, Suwon Cityhall Climate Change Response Division, REPUBLIC OF KOREA, K015

We should treat the global warming issue seriously, and produce environmentally friendly products that are recyclable.

F, De Lin Institution of Technology, TAIWAN, T018

I believe we've passed the "tipping point" in climate change. Anything is now too little, too late. The importance now is to clearly assign fault. Tell the truth about capitalism's failure, the power and greed of the 1%.

J.M. Valenti, Ph.D., 019

Climate change is effecting sea level rise and will flood many coastal cities.

Robert Stephen Mahoney, Associate Professor, Johnson and Wales University, U.S.A., 028

This survey is too centered on cities. There are methane hydrates on continental shelves and in tundra regions that threaten great acceleration of global warming. We need to be able to detect when they are going unstable (melting), and we need to produce the most vulnerable of them for energy fuels BEFORE THEY ARE LOST TO THE OCEAN AND ATMOSPHERE. This is an emergency, and it will take ALL OF US to solve it.

Dr. Robert K. Vincent, Emeritus Professor, Dept. of Geology, School of Earth, Environment, and Society, Bowling Green State University, U.S.A., E041

The occurrence of extreme climates is increasing throughout the world. It may result in serious disasters, so effective countermeasures are desperately needed.

*Xu Xu-Cheng, Urban & Housing Development Department / Senior Technician,
Council for Economic Planning and Development, TAIWAN, T053*

With sea levels due to rise significantly in the next few centuries, governments should be gearing up now to reduce the negative impacts which will be forthcoming!

D.E. Pollock, Retired, South Africa, 059

We need to develop a way to incorporate climate change impacts as factors in existing forward planning. This is difficult as science alone cannot project future scenarios which depend on carbon-climate-human interactions, extensive and complex geosphere-biosphere feedbacks and human behavior and ingenuity. While better communication of both problems and likely solutions is acknowledged as vital there is little importance or funding assigned to actually accomplish targeted information exchange between research, policy and business decision-makers and vulnerable communities.

*Liese Coulter, Knowledge Communication Manager, Communication, National Climate Change Adaptation Research Facility,
AUSTRALIA, E059*

Climate change and the adaptation/mitigation required needs to be a much higher priority of both government and the corporate community.

Phil, Dir. Donor Dev., Maine Peoples Alliance, U.S.A., E067

Reduce emissions of exhaust gas and develop more green land.

F, Bayer Taiwan Co., Ltd., TAIWAN, T074

Climate refugees.

David Hong, Manager, Overseas Department, Daejayon, South Korea, 076

Due consideration needs to be placed on the difference between environmental issues on continents and islands. This is not taken into consideration here. Most, if not all these questions suit larger countries better than small island states (which may be covered with water first).

*Dr. Sylvia Adjoa Mitchell, Lecturer & Research Leader of the "Medicinal Plant Research Group",
The Biotechnology Centre, University of the West Indies, JAMAICA, E079*

I strongly feel the risks of climate change are exaggerated in international forums and that climate change mitigation efforts have unfortunately developed as political animals. I do not believe we should dramatically alter lifestyles or economic activities because of climate change at this time. New technologies and renewables should, however, be pursued.

Andrew Oplis, Communications Officer, Sustainable Development Network, World Bank Group, U.S.A., E170

Small Island developing States are at the doorstep of doomsday as they are the first ones to be threatened by the Worldwide environment problems whether it is human induced or natural phenomena that might or might not be exacerbated by human impacts. Climate change (whatsoever the cause: human induced, natural phenomena and/or combination of the two) Small islands have no choice than to get prepared to protect their coasts, and to adopt better urban planning and use of sustainable energies, food and natural resources.

M, Ter-Mer Rodriguez, MAURITIUS, E200

The role of rangelands in the regulation of atmospheric CO₂ concentrations is a critical issue in global climate change research. Rangelands are complex ecosystems that occupy about 50% of the land area in the world. Rangelands are estimated to contain 10~30% of the world's soil organic carbon. It is estimated that rangelands globally sequester carbon in soil at a rate of 0.5 Pg Cyr⁻¹. Worldwide, some 18-28 billion tonnes of carbon are estimated to have been lost as a result of desertification, and grazing-induced desertification in the dry lands has been estimated to emit as much as 100 million tonnes of CO₂ per year. Potentially, much of the loss can be re-sequestered through soil and vegetation restoration. Degradation of dry land soils means that they are far from saturated (in carbon) and thus potentially have a significant capacity to store more carbon. The technical potential of carbon sequestration through desertification control and restoration has been estimated at 12-18 billion tonnes of carbon over a 50-year period. Land use-changes in the recent past, especially deforestation and agricultural expansion in developing countries, have greatly affected the global warming process through emissions of greenhouse gases, affecting thereby climate systems, biodiversity, supply of forestry products, and soil degradation. Dramatic changes in land use have occurred in the arid and semi-arid lands of Asia during the 20th century. Grassland conversion into croplands and ecosystem degradation is widespread due to the

high growth rate of human population and political reforms of pastoral systems. Carbon dynamics in this region is highly variable in space and time. Land use/cover changes with widespread reduction of forest and grasslands increased carbon emission from the region. Re-vegetation is a common method to combat desertification and to prevent soil carbon loss in arid and semi-arid areas worldwide. Although restoration methods by re-vegetation vary with natural and economic conditions, the reintroduction of woody or shrub species in plantations has become increasingly important in degraded arid and semiarid lands. The importance of vegetation restoration may also increase in the future due to its role in carbon sequestration in arid and semiarid areas.

Feryal, JORDAN, E213

Humans emit into the atmosphere the carbon that is buried within the earth. This gas is like a blanket around the planet. We are preparing a trap to kill our children and grandchildren. The present civilization decided to declare the death of the future. There have been many storms this year with lightning, and deafening thunder, leaving the population afraid. Many cloud formations foreshadowed strong winds, toppled trees and damaged homes. The clouds dissipated, there was little rain, or sometimes these clouds were moving at great speed towards the Atlantic Ocean. A clear evidence of hydric stress, the main dam in the Midwest of the country, the Power Plant Furnas waters of its reservoir have dropped to levels never before seen in its history. In the Northeast Brazilian territory, nearly twice the size of France, this year the drought has destroyed crops of cassava, the staple food of the population. The result is dehydrated and malnourished people. There is no denying anthropogenic climate change. The lack of respect for environmental preservation, along with the desire for easy wealth invades the largest rainforest in the world. This is not just an item. There is ample evidence that the forest will disappear. This year the phenomenon of tidal bore on the Amazon River almost destroyed the port of Santana, challenging the greed of economic power. The Belo Monte dam will flood an area of 640 kms² forest. It may seem little, but it will have a major environmental impact. It will work at only one-third of its capacity, because, for eight months of the year its water dries up. Nobody knows what will happen to the Xingu National Park, located after the dam. The So Francisco River, over 3.200 kilometers long, previously known as the river of national unity, with the Brazilian construction for transposition of its waters in the dry season may not reach the Atlantic Ocean, causing serious problems for people who live in their margins. If we destroy the ecosystems in which we live, mankind will be extinct along with it. We know that the soils used in food production are being replaced to produce energy to power vehicles. We need to evaluate the ethanol produced by corn, sugarcane and soybeans to not repeat the mistakes made by the reliance on fossil fuels. We are concerned about the ecological footprint of ethanol production on a large scale. Indiscriminate consumption of virtual water in the future may affect the prices of food, goods and services in commercial transactions around the world. The rate of population growth and progress in most of the world, assures me of the prognosis: Humanity must respect nature and reduce ecosystem changes that occur every day before our eyes, so that in the near future, we do not have starving populations invading territories in search of food and water. There is evidence of risk to the survival of humanity. The destruction of the environment is similar to the black box of the aircraft. After the disaster, it is of a little importance in assessing the causes, but the tragedy has already happened. If we do not take urgent action soon humanity will crash in this giant aircraft, called Planet Earth. I ask you to understand my position, my despair. It's my way of seeing the future based on the details of my realistic observations! I have no other way to predict the future! Excuse my solitary rant.

Ricardo Rocha De Sousa, Advisor, Anbv- Associa O Nascentes Bela Vista, BRAZIL, E218

I may have been overly optimistic in my assessment of the CO₂ problem. I think at 400 ppm, we have exceeded the threshold, and there is nothing we can do to avoid runaway global warming. I think at best humanity's lifespan is measured in hundreds of years if not less than 100 years.

James Fogel, certificate candidate, bioethics, Montefiore Medical Center/Einstein Medical School, U.S.A., E259

It is necessary to strengthen the treatment of chaotic exhaust emissions.

M, Handan Bureau of Housing and Urban-Rural Development, CHINA, C271

The effect of climate change is being felt in an unprecedented ways in Nigeria, but the awareness and understanding is lowest among less educated people with greater implication on adaptation and mitigation.

Dr Ogunjinmi Anthony Adekunle, Lecturer 1 Department of Ecotourism and Wildlife Management, Federal University of Technology, Akure, Nigeria, NIGERIA, E313

[Energy Problems]

There is a need to better understand the coupling of energy and information as a way to find more efficient and evolved solutions.

Antonio Machado Carrillo, Director, Observatorio Ambiental Granadilla, SPAIN, E176

Renewable Energy

The energy crisis in Southern Africa can only be resolved with solar, wind, and bioenergy solutions and clean energy with positive effects to the atmosphere.

Olimpio Nhuleipo, Chief Economist, Ministry of Environment and Tourism, Namibia, 063

Establish a national league (of small, medium, and large cities) with the highest share of renewable energy supply (example: www.solarbundesliga.de in Germany).

Professor Udo E. Simonis, Professor Emeritus, Social Science Research Center, Berlin, Germany, 070

I think another aspect of this issue is when we switch to more renewable energy and more distributed energy production it will shift some of the balance of power away from the old money interests, more to start ups, entrepreneurs, and ultimately the people. There will hopefully be less resistance to change across the board then.

Brian Howard, Editor and Producer, Digital Media, National Geographic, U.S.A., E162

The issue of environmental pollution can be mitigated by the adoption of renewable energy technology. As long as humans will rely on fossil fuels, environmental pollution will continue.

*Rajshree Mokool, Environment Officer, Information & Education Division,
Ministry of Environment & Sustainable Development, MAURITIUS, E177*

In order to solve the current, interlinked social, environmental and economic problems of the Earth, an holistic response should be worked out urgently aiming to tackle this complex issue. CEEweb for Biodiversity indicated the so-called EU-wide Resource Cap Coalition (RCC) advocating for a global resource cap. The RCC lobbies for introducing a resource use cap with a view to ensuring social justice and staying within the earth's carrying capacity. It has developed the so-called Non-renewable energy quota scheme for Europe, the political support of which can help to address the social, environmental and economic issues of today at the very same time through gradually reducing non-renewable energy use in Europe, and thus decreasing EU energy dependence and promoting competitiveness in the longer term, creating a new market for environmentally friendly products and services, supporting investments in energy efficiency and renewable energy resources. This can be done without putting an additional burden on state budgets by providing incentives and interest free loans for citizens, communities and economy to realize needed investments, creating jobs directly or indirectly linked to the maintenance of the energy quota scheme and decreasing inequalities through the fair share of energy resources. The detailed description of the scheme together with the economic, environmental and social benefits arising from its implementation can be found here: http://www.ceeweb.org/wp-content/uploads/2012/03/non_renewable_quota_scheme_RCC.pdf. I would be happy to assist you if you have questions regarding this scheme.

Veronika Kiss, programme coordinator, CEEweb for Biodiversity, HUNGARY, E219

Nuclear Power

Could individual-centered/market-oriented talks manage efforts on nuclear thinking/education? Ridiculously insufficient for survival of humans from phenomenal pollution and destructive problems. Important to avoid accidents by understanding/explaining depletion of gigantic biodiversity.

A. Sethunarayanan, Office on Steich Duty, India, 003

The Fukushima nuclear disaster triggered by the devastating earthquake that struck north-east Japan in 2011 fully illustrates the failure to take into consideration the costs of nuclear power generation. Such costs include the consumptive materials required during a nuclear plant's operating life cycle, colossal expenses incurred during the occurrence of an incident, expenses required for establishing the highest security mechanism, costs relating to the disposal of terminal nuclear waste, the difficulty encountered in finding nuclear waste burial sites, the uninhabitability of the land for over ten thousand years after the revocation of a power plant, and the bitter pain caused by the disasters. As a matter of fact, the overall cost is exorbitantly high. Hence, Taiwan shall promptly make laws to force gradual use of clean power to replace nuclear power, which is the most imperative issue by far.

M, Ministry of the Interior, TAIWAN, T003

We must end nuclear power and nuclear weapons.

John Miller, Ph.D., Freelance reporter, U.S.A., 006

Severe pollution from radioactive matter.

M, REPUBLIC OF KOREA, K006

Next decades, very possible, will be dealing with strategy how to minimize, or how to prevent effects of depleted uranium worldwide.

Svetlana Zunic, Serbia, 052

Nuclear plants could not only cause significant number of human deaths but also damage surrounding natural environment.

The expected results of accidents can be calculated following the formula (Damage from accident) X (Chance of happening). But none of both are small, so nuclear plants should be phased out in the near future.

Hwanseok Song, Intern, Climate Change Center, REPUBLIC OF KOREA, K033

[North and South]

Developed and developing countries face different problems and tasks related to environmental management due to being at different developmental stages. With regard to global environmental management, it is necessary to explore and perfect the relevant trading and compensation mechanisms as well as to strengthen market-oriented operation and technical communication.

M, China National Democratic Construction Association, CHINA, C001

The environmental problem has something to do with capitalism and nations. The biggest beneficiaries of the environmental problem are the advanced countries, but the victims are developing poor countries. We need to seek solutions to live together.

F, REPUBLIC OF KOREA, K041

Developing Countries

Women in developing countries who are suffering from environmental problems

F, Seoul National University, REPUBLIC OF KOREA, K030

Donors should increase funding environmental projects in developing countries. They should build long-term partnerships.

Festus Anjera Ashisoma, Executive Director, Abalekwa Development Organization, Kenya, 068

The changing trans- boundary relationships (Land- atmosphere- water systems) and associated long term repercussions in the food- water- climate arena is likely to emerge as the greatest environmental challenge for scientists and policy makers worldwide. This invites serious global concern and solution oriented planning particularly for the developing world.

Dr. Jitendra Pandey, Professor of Environmental Science, Environmental Science Divison, Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi- 221005, India, INDIA, E086

The cities in developing countries need detailed information on how to manage problems such as land use, raising revenues, from property tax, user charges, keeping infrastructure in top condition, Climate resilient urban development that minimizes risk from disasters.

Dr. Jyoti Parikh, Integrated Research and Action for Development, INDIA, E135

Developing countries particularly need to strengthen education and publicity on environmental protection and improve people's awareness of environmental protection. Attaching significant importance to environmental protection at the time of production and lifestyle choices can mitigate the environmental pollution caused by rapid economic development and achieve sustainable development. With regard to those regions with backward economic development, it is not acceptable to ignore people's disruption and influence on the environment, and the Government should also pay attention to these poor regions in respect of environmental protection. Some minorities living in mountain forests in the Sichuan, Yunnan, Guizhou and Hunan Provinces of China have retained primitive habits and customs such as the "slash-and-burn" farming method and hunting wild animals. These habits and customs have a significant impact on natural environmental disruption and biodiversity. Accordingly, the local governments should take corresponding measures to protect the natural environments in these regions.

He Qiong, Section Member of the Party Committee and Government Office, People's Government of Qianjia Town, Ledong Li Autonomous County, Hainan Province, CHINA, C144

I really don't think that in the developing world it's regulations per se that are the answer, since the laws are so seldom followed anyway. But from what I've observed, first of all there needs to be a massive increase in birth control and women's rights - free birth control, even, since a few pennies to buy a condom can be too much - and there needs to be systems in place to help rural populations stay in the countryside. If they are getting by on their farms, they won't migrate into the cities. But in many cases, young people have to choose between staying in the countryside or getting an education, since universities are in the cities and they don't provide educations that are relevant for rural life. University programs like the Catholic University of Bolivia's UAC at Carmen Pampa and the Agroecologia Universidad Cochabamba's education program for indigenous peoples within Bolivia are excellent examples of ways to help young people become leaders in their rural communities and succeed without moving into the cities.

Jill Richardson, U.S.A., E146

Sri Lanka is a country which is working to make cities more clean and tidy under the present administration. But the country still lags behind aspired standards to make sure it is a safe place for the human beings. Still, in Sri Lanka around 200 people die annually due to diseases related to air pollution. That urges the need of proper measures like city management, systematic constructions and well planned transport systems to tackle pollution. It is believed that Sri Lanka has more than 4 million

vehicles, at present. In a small country, the public will have to be educated on the present level of climate change. When it comes to urban pollution, transportation and urban infrastructure should be shaped to cope with extreme weather conditions resulted from climate change, as adaptation measure soonest possible.

Darshana Ashoka Kumara, Radio Journalist, News Division, Sri Lanka Broadcasting Corporation, SRI LANKA, E156

Governments of developing countries should put in measures where environmental issues take the same concerns as developmental issues. There is need for active environmental governance by all stakeholders

Mr. Emmanuel Salu, Director, Environmental Education Department, Environmental Protection Agency, GHANA, E167

Developing countries are taking the path that the developed countries have taken. Fresh, innovative, ingenious and local solutions are needed to overcome environmental problems (in fact, even for related social and economic problems). India missed the train by not understanding M. K. Gandhi in the proper perspective and adapting, improvising and reinventing some of the ideas, tools and systems that he offered. Now, it is too late! - Rajesh Bhat, India.

Rajesh Bhat, Managing Trustee, Swapath Trust & Western India Forum for Panchayati Raj (WIFPR), INDIA, E169

Unstable political regime and weak governance system in most of the developing countries is one of the major reasons behind the unregulated emission and pollution in cities of those countries.

Dilli Ram Bhattarai, The Small Earth Nepal, NEPAL E190

Environmental degradation is also becoming rampant in our developing countries owing to the lack of observation of the environmental statutes by the less well established international companies coming especially to mine our precious minerals in Africa. Partly to blame is the central government for lack of implementation of instruments that enforce adherence to environmental sustainability. Also these foreign investors are fueling corruption in our countries because they know with money you can buy your way anywhere in the world. We need our rivers and environment for our kids to enjoy

Lennon Madzamba, Chief Consultant, Environment and Energy, EnE International, ZIMBABWE E, 205

Policing and enforcement of Environmental Laws are lacking in Pakistan. There are sufficient and good Environmental Laws but they are not being adhered to.

Shahid Sayeed Khan, CEO, Indus Earth Trust, PAKISTAN, E244

An important and feasible reality for developing countries is the education and implementation of renewable energies. Almost nothing is done or known about this field, and many of these countries cannot afford to pay for oil imports. This is a subject that should be considered in more detail.

Bert Kohlmann, Director, Centre for Research and Development of Renewable Energies, EARTH University, COSTA RICA E262

Developed Countries

In developed countries, it would be beneficial to encourage local food production and consumption, thereby decreasing the environmental costs of food transportation. This involves changing the culture of food, as well as the power of corporations and industrialized farming.

Li Miao Lovett, City College of San Francisco, U.S.A., 024

Developed countries should contribute more money in green insurance and green fund.

Makuregye Nathan J.G, Program Officer, Energy and climate change, Pro-biodiversity Conservationists In Uganda(PROBICOU), UGANDA, E225

Developed countries are obliged to assist developing countries, particularly large countries like China, in improving their abilities regarding scientific pollution control. Environmental protection and pollution abatement require a joint effort from the whole world.

M, CPC Danzhou Municipal Committee of Hainan Province, CHINA, C258

[Multiple Recommendations]

1. It is important to strengthen the development and utilization of new and alternative energy resources as well as to change the leading consumption pattern of current carbon energy;
2. Insufficient and ineffective education in environmental protection is a serious problem. Particularly in developing countries, it is necessary to implement education on environmental protection for children so that everyone keeps environmental protection in mind and has an awareness of environmental protection;
3. It is necessary to put environmental protection on a legislation-based course by establishing perfect, strict and enforceable

regulations on environmental protection. If behaviors that contravene laws and regulations appear, it is necessary to impose penalties with the relevant degree of severity, without mercy. Meanwhile, it is feasible to research and establish a more extensive incentive system for environmental protection in order to encourage technological innovations and conscientious environmental protection;

4. In order to achieve global environmental protection, it is necessary to strengthen international cooperation, establish international standards and an international supervision system, upgrade the standard for carbon tariff collection, and penalize any country that is ineffective in terms of environmental protection.

Chen Wanli, Student, Graduate School, Party School of the Central Committee of C.P.C., CHINA, C012

In China, the effect of environmental protection will not be obvious if the Government of China and local governments do not participate. In addition, the public's awareness of environmental protection is not fostered in one day, and it is necessary to implement long-term education in environmental protection.

M, CHINA, C022

In Taiwan, current environmental problems mainly result from disasters caused by extreme climate warming. The climate countermeasures currently adopted by Taiwan's construction departments are still limited. I hope that the government will adopt a structural policy system to develop a strategy that can tackle problems related to climate change and greenhouse gas emission. Regarding urban renewal, I hope that the difference between the new and the old departments will be used to solve problems resulting from the stress urban renewal has placed on property redistribution. In addition, in regard to the renewal of old buildings, balancing and extension of the buildings' life cycle can be taken into consideration. Moreover, building renewal and preparedness rules should be put forth.

M, National University of Kaohsiung, TAIWAN, T022

Decision-makers and cities must be informed about the long-range consequences of doing nothing. Public awareness efforts must be candid about change required. Each city must recycle all its waste. We need each city to be self-sustainable. First we need a model city. (Nation-wide grids are too vulnerable!) Climate change will force all issues. We must be proactive to avoid knee-jerk decision making in the future.

Bonnie L. Harper-Lore, Advisor, National Invasive Species Council, U.S.A., 026

The vast majority of women would not choose to have 10 children. Population will naturally decline if women have family planning choices. The Pope is the world's single most important blockage to reasonable population. It is time the Catholic Church admitted times have changed and retracted their stance on this issue.

The second big picture item is production of waste. Consumer-societies are doomed to failure. We must reduce production of waste, regulate and enforce packaging and reuse, charge waste companies who pollute (which is all of them) and issue huge fines to pay so that communities objecting to or harmed by waste can use the money for defense.

Candice Vetter, Writer, Canada, 029

The crux of environmental protection is to change the modes of production and consumption. In terms of production, the aspects that require the most attention are the input structure of production factors and the utilization efficiency of these factors, particularly the problem of the utilization efficiency of energy resources represented by coal, electricity, oil and gas as well as the problem of market pricing; in terms of consumption, the aspects that require the most attention are the technologies for disposing of and recycling waste and exhaust gas, as well as changing people's concept of consumption.

M, Party School of the Central Committee of C.P.C., CHINA, C037

The in-depth problem is dual: a continuous increase of the population and the excessive waste of an ever larger population, with the rest being a consequence of this. The first problem is taboo in many societies (including the West with strong Catholic pressure) for which the environmental education provided is segregated; the main issue is avoided and is based on formal topics which at times are even counterproductive. This questionnaire reflects this. Decontamination, as an energy process is also a contaminant (as another example). If we are not environmentally well informed, without political or religious prejudices we can never efficiently eradicate environmental problems.

M, IRNASA (Institute of Natural Resources and Agrobiology of Salamanca), SPAIN, 062

It is necessary to strengthen environmental education and the concept of environmental justice with participation... In Andean countries and particularly in Peru, no improvement can be seen in the promotion of qualified resources to direct sectoral and intersectoral plans and strategies for a better handling of the problems associated with the environment. The work still remains concentrated on few actors with little satisfaction of the citizenry.

M, Andean Health Organization – Hipólito Unanue Agreement, PERU, 082

Environmental protection should be achieved not only through relevant laws and regulations, but also with fiscal and tax

measures. Every individual should possess a social awareness of environmental protection. With regard to relatively wealthy urban people, it is necessary to restrict them, mainly with laws and regulations, because these people actually understand environmental protection to a certain extent, and their behaviors in contravention of the relevant laws and regulations simply aim to pursue their own interests. All in all, only commensurate punishments can achieve a certain effect. With regard to poor people, they are not likely to pay any attention to environmental protection, so education on environmental protection is certainly necessary. However, I think that it is still necessary to solve their poverty, because they are unable to spare their energy to pay attention to environmental protection if they are struggling in terms of livelihood.

F, Student, CHINA, C087

It is necessary to achieve environmental protection in terms of multiple aspects. (1) The Government should implement practical plans for environmental protection and should popularize environment-friendly technologies and products so that the venous industry achieves significant development; (2) The public should actively participate in environmental protection and really change their ways of life and consumption as well, as it is necessary to advocate an economical and environment-friendly lifestyle. (3) All of society should attain the common perspective of finding environmental pollution and energy waste shameful and environmental protection and energy conservation honorable, as well as establishing a corresponding incentive restriction mechanism.

M, CHINA, C088

Environmental management needs to establish corresponding management modes and systems. With regard to environmental management tools, it is necessary to change from traditional compulsory policy instruments to market-driven flexible management tools; with regard to the subjects of environmental management, it is necessary to break through the single environment management structure with governments as the core and allow more enterprises and citizens to participate, as well as making cooperation, trust, reciprocity and win-win situations become the attractions of diverse subjects. It is necessary to view energy conservation, emission reduction, environmental protection and new urbanization as well as the adjustment and upgrading of industrial structure as the new economic growth points of cities. Urban development is undergoing the process of action and stage binding. In other words, low-carbon cities are not limited to being part of environmental management, but are connected with the transformation of local economic society, and as a result, added social value has started to appear. In this process, it is necessary to match the existing system arrangement with new relevant systems and functions, establish new rules of action or perfect the existing system arrangement.

Li Fan, China Development Research Foundation, CHINA, C125

We cannot achieve sustainability without addressing the causes of environmental problems: population and lifestyle.

Peter Seidel, independent writer, U.S.A., E129

It is necessary to change the lifestyle of high dependence on substances, and advocate harmonious, natural and environment-friendly ideas of life from education, publicity and culture. It is necessary to strengthen the cooperation of environmental protection between our country and the regions, including the culture, ideas and lifestyle of environmental protection, environmental protection technologies, social ideas that are beneficial for environmental protection, economic ideas that are beneficial for environmental protection, economic organization modes, the achievement of environmental protection, etc.

International environmental protection organizations, governments, economic entities, non-government organizations, successful people and every citizen should do something for environmental protection.

M, Shanxi Province, CHINA, C138

Firstly, we need to finance wind and solar power as a leading global priority. Both installation and research. Secondly, if we work now to expand clean water and family planning, won't population stop rising so quickly and reduce pressure in the future? Thirdly, what have we done to plan for rapid climate change, or a shift to a new climate state?

Matthew Owens, CEO, Fairfax Climate Watch, U.S.A., E138

1. Strengthening the enforcement of regulations on environmental protection is equally important with supervision and legislation.
2. It is vital to improve people's basic qualities as soon as possible so that the citizens are willing to participate in environmental protection.
3. It is necessary to appropriately introduce market instruments such as emissions trading in addition to government actions.
4. Governments at all levels should view the environment, resources and people's well-being as primary goals, rather than continuing to focus on GDP.

F, CHINA, C159

It is necessary to effectively control the excessive increase in population, reduce the use of energy-consuming materials in

building (such as glass curtain walls), actively develop renewable energy sources, establish a refuse disposal circulating system and actively popularize the low-carbon lifestyle.

M, Shenzhen Huahui Design Co., Ltd., CHINA, C178

Three levels of action: Rich people in poor countries, as well as in rich countries, must be encouraged to embrace more sustainable consumption. Governments should make and enforce high standards, tax undesirable damaging emissions etc., invest the proceeds and tax desirables like jobs and work, less. This would be part of alleviating poverty. Poor people will be helped individually by basic education, equal opportunities for women and local community schemes for energy, water and sewage management and communication. Collectively, at local and national level, elimination of corruption, security of tenure, efficient legal institutions and mechanisms for investing in their own infrastructure to discourage tax evasion and capital flight will be needed- The global society will need to strength corporate governance through - better rules like a further improvement of the OECD guidelines” to encompass company supply chains - national legislation extending to citizens’ international activities (not only covering corruption like today but extending to human rights and environment crimes). - Investor action like pension funds curbing actions by companies that damage the long term future material interests of their investors beyond the purely monetary aspect. The de-facto lawlessness in some nation states today leads to global trade helping to accelerate unacceptable labour conditions destruction of the environment and human rights abuses - instead of bringing better conditions for all as the intention was when opening borders. p.”

Paul Hofseth, previously Senior Adviser, Deputy Director General etc. Now Expert Adviser reviewing environment ed. at Sweden’s Universities – previously Ministry of Environment, Now Govt. of Sweden’s education min., NORWAY, E180

Awareness of authorities AND population and conviction that something needs to be done urgently is a key to actions becoming more widespread, credible and effective.

M, Independent Consultant, SWITZERLAND, E197

1. The business economy is aggravating environmental disruption, and the pursuit of interests causes endless environmental disruption. But there is no solution to greed because the pursuit of interests is the natural character of mankind.
2. What Chinese people can do is to pay attention to environmental protection from every detail, commence environmental protection with everyone, refuse commodities with a high energy consumption, refuse unrealistic comparisons, refuse vulgar grandstanding and improve their own quality.
3. Every developing country is developing its economy. We think that we are marching towards heaven, but in fact we are stepping into hell because this economic development comes at the cost of environmental disruption.
4. I hope that the environmentalists can further popularize the severity of environmental disruption and the possibility of wars caused as a result so as to attract people’s attention.

Yan Yongwang, CHINA, C225

To achieve a sustainable environment, the key requirements are: Stabilise the number of people at a sustainable level. Reduce the gross over consumption of irreplaceable resources in affluent countries. Reduce the gross inequalities of resource distribution between countries and between rich and poor people.

Stephen Bown, Director and Professor, National Medical Laser Centre, University College London, U.K., E241

1. The laws and regulations on environmental protection have not been implemented effectively.
2. The Government has clung to the concept of paying attention to development and ignoring environmental protection, and has thus taken the wrong measures.
3. The public’s awareness of environmental protection is very weak, so it is vital to urgently strengthen its awareness of environmental protection and encourage people to participate in environmental protection.

Wang Hailong, Senior Staff Member, Department of Water Resources of Xinjiang Uyghur Autonomous Region, CHINA, C243

1. Perfect the legal systems and enforce the laws with rigidity
2. Strengthen the penalties
3. Utilize social opinions and public supervision

M, Shizhong District Party Committee of Leshan City, the CPC, CHINA, C248

[Other]

We should support the people who are the most vulnerable to environmental change.

M, Kyunghee University, REPUBLIC OF KOREA, K003

Excessive packaging of many cosmetic company and low awareness of people about the environment. As Bodyshop does not

produce samples, customers often complain that Bodyshop does not give them samples like other shops.

Eunkyung Park, Director, The Bodyshop, REPUBLIC OF KOREA, K008

When it comes to dietary habits, the effect of balanced diet between vegetables and meat should be discussed.

Seungphil Lee, Department head, Yuhan Kimberly, REPUBLIC OF KOREA, K014

This year's climate irregularity, such as the worst flooding of the Rhine River in 500 years and the large-scale melting of some glaciers, demonstrates the magnitude of the greenhouse effect problem. Taiwan has a small population and geographic size, but it has high per capita energy consumption. Furthermore, it is an export-oriented, economically powerful country, but, due to political factors, it cannot actively take part in international earth rescue organizations and related activities. We look forward to support from Japan and other friendly countries.

Huang Guang-Hui, Retired, Chia Nan University of Pharmacy & Science; Environmental Protection Administration, TAIWAN, T030

1. Samples are coming to Bahrain, Oman and Dubai based environmental laboratories from Saudi Arabia, Oman, Kuwait, Qatar, Bahrain, Iraq, Kazakhstan, Russia + Russian old parts worldwide to test the Organic analysis: THC, HC, PAH, PCBs, OCs, BTEX, Pesticides, and Toxics. But as there is not accreditation system for these analyses till 2003, Feb, now these two polar ice is going to reduced in 60% of its size-real.
2. They are using fast analysis, which is not a parameter of US-EPA/APHA. Why are Russia, Venezuela, ME=Gulf & all world nations governments not sending them samples? (to check the level of Accredited laboratory with spike of different levels ppm, Ppb, ppt) from the Client itself without the knowledge of Tested Laboratory. Checking (of lab's) should be without notice to company & should be honestly (with consideration of life, based on analysis,) here people have links with different labs and they are consultants (those are working for money not for environment.) They are mainly Indian (they are not concerned with the consequences of cheating fake analysis), having a link so they will tell all labs (testing labs) to produce those results which required by the Client to pass samples so all testing labs will give same results (by knowing that these are accredited labs it's easy) This note is for UN, UN Environmental protection branch and USEPA to protect world environmental, climate change.
3. In ME=Gulf its notorious if you want to pass out your environmental samples, any hazardous, toxic sample.
4. Give it to Indian environmental-testing laboratories-Indian ownership companies, where they take money from you and will give the data which you have given them.
5. The ME=Gulf maximum testing laboratories are Indian only ownership. Staff are also mostly Indian from Supervisors to Chemists, and technicians all are Indian. Everybody knows that TI (Transparency International report) has reported for the past 60 years that India is named in the top corrupt nations, they just want money, salaries and jobs and will give all fake, corrupt data.
6. Like situation also applies to LTS Dubai, many higher officials of the UAE Based company told me that LTS is passing samples for money. Its owner, and staff were Indian, only south and north Indian.
7. If UN, EU, USA (white house USA) want to save the world environment then please remove Indian ownership from all testing laboratories of ME=gulf and remove Indian staff also=Supervisors to chemists to technicians, and give their jobs to EU, USA, Chinese people as they have been proven honest over the past 60 years, which can be confirmed by transparency international's past 60 years reports as its UN Branch to anti corruption best human.

Ruhel Chisty MRACI CChem A, president / reviewer, Political Research Quarterly, International affair, The British Journal of Social Work, Published by Oxford University Press, UN, INDIA , E031

The invitation to select and to prioritize is problematic because all measures are vital and not mutually exclusive. However my instinct is that those measures that foster a sense of community ownership and responsibility are those most likely to ensure take up at implementation stage of the governance process.

Simon Read, Senior Lecturer, Fine Art, Middlesex University London UK, U.K., E033

Our society has changed from measuring success by a person's good impact on his/her society and environment, to how much money he/she can amass by any means (greed). Our challenge is to encourage individuals everywhere to leave this planet a better place, environmentally at least, than they found it.

Shimon Schwarzschild, Founder, Former President Emeritus, Action for Nature Inc., U.S.A., 044

It is impossible to separate the responses required to deal with this multiple crisis. We live in a world which is becoming increasingly divided between those who have a right to a dignified life and those that are excluded. We are confronted with major problems linked to urban issues: pollution, overcrowding, poor housing, poverty, health, and crime rates which can only be alleviated by a coordinated response involving new infrastructure, new technologies, and better education. Often governments are unable to deliver change as they are driven by vested interest, cronyism, and short term thinking related to success at the polls. If you want things to change, you have to give people hope, and a renewed faith in the future. The global political elite are incapable of delivering change, as they are only interested in the survival of their own group, and not in the improvement of the lot of their fellow human beings. Those who are dispossessed and without a future cannot be concerned

about the future of the World.

Nighat AMIN, Vice president, Legal and International Affairs, International Polar Foundation, BELGIUM, E077

Desertification and stress on aquifers in dry areas are HUGE problems because this is a kind of damage that cannot be undone and it affects the whole globe, but because it happens in North Africa or Israeli-occupied Palestinian territories — who cares?

Catherine Cassara, Associate Professor, Bowling Green State University, U.S.A., 079

The root cause of most environmental problems today is weak value given to ethics in economic activities and more particularly in governing the states and state mechanisms. Therefore, the greatest need for humanity today is to strengthen especially among rulers the sense of ethics and morality and thus towards the nature and to our common planet earth and its inhabitants.

Dr. Ek Raj Ojha, Visiting Faculty - TU; Founder Chairman – PRDC, Environmental Economics at TU / Consulting Services – PRDC, Tribhuvan University / PRDC, NEPAL, E113

Extreme poverty and corruption, both in private and public sectors, are the biggest contributors to environmental degradation and deterioration. Any mitigation measure to protect the environment will have little chance of succeeding if none of these contributory factors is eliminated or reduced significantly.

Dionisio Papelleras Jr., Executive Director, Center for Social Responsibility, University of Asia and the Pacific, PHILIPPINES, E126

TO KEEP AWAY PSEUDO-ENVIRONMENTALISTS, THE GREATEST RETARDENTS OF INDIA. Environmental Engineering essentially requires knowledge of hydraulics, and civil engineering thus became an essential prerequisite for admission into the Master's course. Thus, for non-civil engineers, the prerequisite, for advanced courses in water treatment its prerequisite should be the undergraduate level water treatment, hydraulics, mathematics and this academic sequence is logical. Indian authorities, without applying their minds, allowed admission of students of almost all science and engineering branches into the said Master's level Course in Environmental Engineering on the pretext of interdisciplinary approach without enforcing the stated prerequisite concept. Due to heavily rising remunerative consultancy scope in environment related areas, the adulteration, degradation, dilution, etc. of environmental engineering education was planned, thanks to the lobby of pseudo-environmentalists. In the Indian Ministry of Environment, the real environmental engineers are outcasts and a virus which fact is easily reflected in the failure of numerous environmental projects including the several Ganga Action Plans despite all possible efforts at all levels. The consequences on the quality of this education, were serious apart from induced corruption in environmental clearances, testing of treated effluents, etc. The students were not only made scapegoats but finally landed to become neither science specialists nor environmental engineering specialists. Such young students got lured into such a trap and there was a mad rush of young science students in particular to somehow get admitted into this diluted master's course in environmental engineering. If the prerequisite concept was not considered essential then one may wonder what prevented admission of arts, music and dance graduates. The teacher felt being in a dilemma in a mixed gathering of students coming from civil engineering, non-engineering. If taught at science level, then a civil engineering degree holders will feel cheated and if taught for civil engineering graduate level, then the science students will not understand a word. On top of this, when somehow appointed through bribes, pseudo-environmentalist teachers having zero knowledge of hydraulics and mathematics had reportedly taught some highly technologically oriented courses. Perhaps such teachers misused the academic autonomy/freedom of their IITs or Universities in managing to teach as well as in managing to pass all the students. Such pseudo environmentalist teachers even falsely designated themselves as professors of civil engineering to misguide industries for remunerative consultancy. Most Indian Universities have started a Master of Environmental Science hoping that the pass-outs will do environment related technical and engineering jobs. UPSC, the apex Indian commission for recruitment, does not differentiate between Master level degree in environmental engineering and science or between real and pseudo environmental engineers and call both of them for interview for the same post together. A legal remedy in this regard failed which fact only manifested the severest level of disregard for academics and academic standards in India. Further, in matters pertaining to environmental legal issues, those who argue as well as those who listen and judge are not well acquainted with the meaning and implications of the many environment related words/terms. On the overall, the Indian authorities do not seem to have any will to remedy the situation. Therefore, be cautious, before recruiting an environmentalist qualified from India.

Prof. Dr. Devendra Swaroop Bhargava, Retired, Professor Environmental, Environmental Engineering Division, Dep. Of Civil Engineering, Indian Institute Of Technology, Roorkee, India, INDIA, E142

Attention to environmental issues is insufficient. Common people's understanding of environmental issues is still insufficient. Common people can truly comprehend environmental issues only after they are harmed, but it is too late by then.

M, Huajie Company, CHINA, C148

Hopefully my country -- Canada -- will step up to the plate again and help be part of the international team that seeks and pursues solutions rather than exercise simple rhetoric!

M, self-employed independent consultant, CANADA, E153

It needs to broaden and enhance NGO's cooperation in researches and real activities.

Viktor Khazan, 1st Vice Chair, National Environmental Association, Zelenyi Svit/ Friends of the Earth Ukraine, UKRAINE, E179

Education and multi stakeholders engagement is always at the base of a successful programme, but I consider it as a cross cutting issue and did not mention for all categories.

F, RGI, GERMANY, E210

Awareness is only through education and detailed planned projects; here the poor and rich fight for their own concerns and a major social conflict is that no one can handle their basic life problems here. In each second a big environmental problem issue is discussed in a few high profile meetings although the aim is not to solve these problems but only to show their positions to each other for the sake of prestige. The public do not know what they talking about.

Shahab Ali, Quality Control Manager, Quality control, Ipram international Islamabad Pakistan, PAKISTAN, E227

Risk management and CCA needs to be introduced into all professions at academia.

Gerardo Huertas, Director DM for Latin America and Caribbean, Disaster Management Department, World Society for the Protection of Animals -WSPA-, COSTA RICA, E242

Taking initiative for urban poverty alleviation and capacity building of the poor household.

Dr. Md. Alimur Rahman, Senior Scientific Officer, Agronomy, Bangladesh Agricultural Research Institute (BARI), BANGLADESH, E248

My conclusion is that because of big business and high poverty Planet Earth will continue to suffer ecological collapses until the moment when those who decide everything on our planet as well as the rest of us feel the consequences.

Miroslav Raievi, President, Ecological NVO Klimatske Promjene AGF – NGO Climate Change AGF, MONTENEGRO, E253

I can still remember the sense of euphoria, as a proud representative of our local community, honored by being a participant at the UNCED in Rio de Janeiro. Our campaign back in the UK was successful, ancient Oxleas Wood in Greenwich was saved from an absurdly destructive road scheme, which was finally withdrawn in July 1993. Corporate vested interests, closely allied with the UK Department of Transport, were not the only obstacles that we encountered during the campaign. Interference from the national NGO community intensified as our media profile grew, in their attempts to expand membership and enjoy some of the fruits of our efforts. Local action was the determining factor in our success, ultimately the only effective defense of communities and their environment. The road scheme did return in a modified form and was again defeated by essentially local opposition. Twenty years on and an equal number of attempts to provide coherent responses to the ensuing ASAHI GLASS questionnaires, I feel that I have been watching the momentum generated by the Earth Summit dissipate at an alarming rate. Environmentalism, once a seemingly viable force, has become lost in its own clichés. Sustainable development, the rallying cry of the UNCED, has been taken up and subverted by less wholesome interests, business or otherwise. "Sustainable" as an adjective and "eco" as a prefix, in conjunction with misuse of the term ecological, are scattered liberally throughout the tedious propaganda issuing from government and business sources, as the natural environment continues to disappear before our eyes. Reliance on empty verbalization instead of valid action, propaganda rather than honest evaluation, will see the UNCED relegated to the status of a historical curiosity. Local action is first and foremost in the protection of community and environment, urban or elsewhere. Thinking globally is a necessary stimulus, acting locally is imperative.

David Black, Trustee, Ecology/Publicity, Oxleas Wood Challenge Fund, U.K., E282

Economic crisis - lack of funds for solution of environmental problems.

Vladimir Caboun, Scientist, Forest and Landscape Ecology, National Forest Centre - Forest Research Institute, SLOVAK REPUBLIC, E303

Environmental education and citizen participation (in the local decision making) are the most vital components for improving life in cities. The participation of informed (through education and as part of decision making processes) citizens in the political decisions will automatically lead to better urban areas. Citizens can elaborate and decide on measures for poverty reduction, population control, environmental standards and measures etc. All that is required is a process that allows participation of informed citizens in the political process (in a random way, to avoid any lobbyism and development of personal interests).

Heike Hoedt, Vice President, Solare Bruecke e.V., GERMANY, E304

We all should try to convince the people of the world and the governments, especially in affluent countries, that nothing is more destructive and unnecessary than war. We should make international corporations understand that without population control and without improving the intense poverty of Asia and Africa, there will be no future for them.

Hamid Taravati, Managing Director, Managing, Taravat Bahar Environmental Institute, IRAN, E305

Comments from Japan

[Topics, Problems, Strategies, and Suggestions for Environmental Problems in Japan]

I am concerned that interest in Japan in the Earth's environmental problems is diminishing. I hope that Japan would clearly state its goals internationally, and assume a leadership role in the environment.

Shigeru Sumitani, Chairman, Social Welfare Organization Saiseikai Imperial Gift Foundation, Inc., 004

There are 1.1 billion people who live on less than one dollar a day. Much of the world's environmental problems are created by people living in developed countries, even though the effects of climate change and environmental pollution are distributed equally. Japan, a country that possesses environmental technologies and has the experience of overcoming problems like pollution, has a significant role to play. Each citizen must recognize his role as a member of the global society. I spend each day thinking about the importance of continuously searching for what needs to be done.

Chizuko Morita, Director, Furoshiki Study Group, 018

It's said that Japan puts the economy above all else. I feel that the attention is turning towards economic developments, and the public is losing interest in the prevention of climate change and measures to protect biodiversity. This is my fear, above all, because it's important that we continuously engage in environmental problems.

Miwako Sakano, Director, Department of Landscape Beauty, Nara Prefecture, W027

In having to rely on thermal power generation as a result of the nuclear disaster in Fukushima, environmental problems seems to have taken a back seat. I hope for more aggressive advancement of renewable, natural sources of energy, like the leasing of roofs for solar power generation.

M W042

Although the environment in Japan has improved greatly, when seen from a global level the situation is extremely dangerous. And that condition has a close relationship to lifestyles. And, unfortunately, we cannot change the direction of global-scale economic activities, including the use of scientific technologies. In such a case, the education of the next generation becomes the most important priority as the way forward for improvement. On this point, even in Japan, one would be hard-pressed to say that environmental education is sufficient. In reality, environmental awareness among students is demonstrably declining. Problems having to do with scientific technology and resources are at its limits, and are forcing the global environment and ecosystems to overreach. The public must recognize this fact, and decide to move forward with societal progress only if it fulfills the prerequisite that there will be no additional burdens on the environment.

Izumi Watanabe, Associate Professor, Agricultural Research Institute, Tokyo University of Agriculture and Technology, W044

It seems that society is becoming more and more unsustainable and symptoms are appearing, like the materialization of global warming and the expansion of income disparities. I believe that the reason lies with the inability of politicians and economic leaders to have any perspective other than through the short-term lens of the economy. In order to resolve environmental issues, what is important is a long-term perspective, in other words, a sense of morality that prioritizes the next generation, coupled with a scientific perspective. I think that is what is lacking in Japan.

Konoe Fujimura, Co-Director, Japan Association of Environment and Society for the 21st Century, W048

We ought to actively become involved in the improvement of the Chinese environment. It is possible that Japan will become an environmental victim.

M, W060

I am convinced that Japan has the ability to lead Asian countries in a sustainable direction. But in order for that to happen, the Japanese citizenry would need to be prepared to make a large sacrifice in living standards and to have a strong sense of commitment.

F, 067

I find it intolerable that we are forced to silently remain on the receiving end of the yellow dust and PM2.5 that travel on the Westerlies from China to Japan. Shouldn't we raise our voices higher to protest this situation in China? As a country taking such uncompromising stances on many issues, China may have a good solution.

Kazuo Tomisaka, W068

Putting renewable energies to practical use is a theme facing Japan. Globally, I think that economic equality and stability are important.

Fumihiko Jiku, Professor, Department of Science and Engineering, Ryukoku University, 094

In recent years, it feels as though the four seasons in Japan are becoming two seasons. It also seems that many organizations are taking the stance that it suffices to have some degree of social service and charity in lieu of making meaningful contributions and CSR. The time on the Environmental Doomsday Clock is bound to continue advancing unless we turn our eyes more towards sustainable activities that leave positive effects for future generations.

Ryuichi Ueda, Director, TEM Environmental Management Systems Research Institute, 101

We must prepare international agreements and domestic strategies that take advantage of the foundation provided by the Kyoto Protocol. Japan must fully reengage in the second commitment period of the Kyoto Protocol, and lead in implementing strategies. We must transform our society and economy to a sustainable one. In order for this to happen, society, economy, lifestyles, and international relations must go through a significant transformation.

M, W103

Japan is known as a country of natural disasters. But on the other hand, it is also a country with a high concentration of energy created by the cycling of the atmosphere and water, as well as volcanoes. We should focus our attention on these assets and aim to become a giant of renewable energies over the course of 100 years. With the remaining capacity, it is important to have a long-term perspective for Japan to contribute to solving the world's environmental problems.

Eitaro Wada, Fellow, Japan Agency for Marine-Earth Science and Technology, 125

We must transform ourselves away from the mass production, mass consumption economy based on the large-scale consumption of fossil fuels, characteristic of the period through the 20th Century. Instead, we must transform our economy and society into one that is self-contained within each sphere of livelihood. The Japanese archipelago has an accumulation of small-scale technologies that are regionally self-contained, beginning with Japanese-style manufacturing that finished developing during the Edo period, giving it the potential to lead the developing countries of the world.

Yusuke Kusuhara, 132

I feel we need to pursue sustainability by making Japan's urban strategies more and more innovative. Measures with comprehensive perspectives are essential, for example, building cities to be more compact in anticipating their shrinkages, the greening of spaces between cities and suburban areas, and treating agriculture not as a simple industry, but as a package to preserve the environment.

Hidenori Sakamoto, Professor, Interior and Architectural Design, Kanazawa College of Art, 141

I feel that Japanese environmental technology is outstanding. But on the other hand, I also feel that citizens who have a solid environmental consciousness and are putting into place various efforts are extremely few. I believe efforts are necessary to increase smart citizenry along with smart cities. Even if we visit environmentally advanced countries and regions, if we only study their technology and incorporate only the the scientific portions, it will not take root without a change in people's consciousness. There is no meaning in "missing the forest for the trees."

M, W142

In the future, the world's population problem will take on more importance as an environmental problem. But before the population problem becomes more pressing, I believe related issues like resource problems, food problems, water problems, the widening of income disparities, and war will materialize. There is a need to establish an international organization to research and discuss population problems, and implement measures as soon as possible. Further, there has been a weakening in recent years in international cooperative relationships where environmental problems are discussed and appropriate direction towards solutions are agreed upon. For this reason, I hope that Japan will be able to bring its environmental technology to the forefront and advance innovation towards the solution of environmental problems overall.

Michihiko Suzuki, Chair, Sustainable Management Forum, W144

I currently have the opportunity to engage with people from many sectors at a government agency that deals directly with global environmental problems. I feel that it is wonderful that there is a recognition that environmental problems are shared throughout the world, and that many researchers are working towards its resolution. But on the other hand, it remains unfamiliar at the citizen level, and I believe we are not at a point where we can make a large transformation away from the mass production and mass consumption lifestyles of developed countries. In particular, when living in an island country like Japan, there is very little interest towards the realities in developing countries. This makes indispensable the implementation of specific measures at the level of ordinary, daily life.

M, 174

In our country, it is essential that we depart from the current thinking, which lacks in the recognition of the crisis that the global environment is in. The current thinking is centered on the business world and is based on an extremely narrow perspective

that is biased towards “economic revitalization.” We must also depart from the resulting national policies that is lacking in strategies reflecting mid- to long-term perspectives.

Makoto Hoshino, Counsilor, World Wildlife Fund, W183

With the effects of the Great East Japan Earthquake, discussions on climate change measures is still hushed in Japan. However, with reports that the concentration of CO₂ has exceeded 400 ppm, I think that various extremities in weather will take more visible shape on a more frequent basis. Once Japan has recovered from the earthquake, I believe it must assume a leading role once again in strategies against climate change.

Toru Morotomi, Professor, Graduate School of Economics, Kyoto University, 190

The recovery of the Tohoku region may become a significant turning point in Japanese environmental policies. If Japan were to pour the funds it would need to build 100 nuclear reactors into cities that use renewable energies and to revive towns and villages, this can become an important milestone that allows Japan, both in name and in substance, to take the helm of environmental endeavors in the international community. 200 trillion yen is the equivalent of 2,000 companies making contributions of 100 billion yen each. In return, these companies would receive a 10% tax deduction over 10 years. There would be large parking lots free of charge near stations, bus stops, and highways, and each household would install an ice room to capture the power generated with the sun’s heat and light through the Seebeck effect in the summer. Implement a way of living that avoids the concentration that is the cities. Solve the problem of impasse in transportation networks caused by the branching of railways, and create looped networks that work like blood vessels.

Koji Yamamoto, Professor of Medical Engineering, Department of Healthcare, Junshin Gakuin University, W191

When thinking about the global environment, there is only one answer. What can we possibly hope for in Japanese politics, which is considering reactivating nuclear plants and is pursuing a 20th century type economic model that assumes the wasteful use of nature and resources?

Akira Morishima, Professor Emeritus, Hiroshima Shudo University, W204

Even though it was through a history of tragic experiences, Japan has the experience and technology of having achieved economic development while for many years, dealing with pollution in its society. Instead of adhering simply to past methods, I believe the pressing task is to adapt these experiences and meld them with the technology that is required for present needs and develop and distribute them in such a way that they can be incorporated in the development of the world (particularly in developing countries).

Hirofumi Aritani, Associate Professor, Department of Life Science and Green Chemistry, Saitama Institute of Technology, W221
With the unraveling of the Fukushima Dai-ichi Nuclear Plant, I think that hedging and circumventing our risk with nuclear power against disaster, war, and terrorism has become the most pressing environmental problem. More than 100,000 people around the Fukushima Dai-ichi Plant are still unable to return home, and do not know when they will ever be able to, making them “nuclear refugees.” Considering these circumstances, it can be said definitively that abolishing nuclear power goes beyond the environmental problem of radioactive contamination, but rather, it is a common issues shared by the world to protect the continued survival of humankind.

For example, as of January 2013, China has 18 reactors, a little less than a third of what Japan has. But it is currently constructing 29 reactors, and by 2050, they plan to build a 400 reactors to produce 400 million kilowatts. That may sound abstract, but it is an amount that surpasses the total global output of the world’s nuclear power as of January 2012, of 384.46 million kilowatts. If, for example, Japan were to activate all 50 of its reactors, it would output 46.1 million kilowatts, so it is approximately 9 times that amount. China then would be the world’s largest nuclear power.

Now, what if there is a large-scale nuclear accident in China? It cannot be done away with by a simple, “we couldn’t have anticipated such circumstances.” The radioactive particles will strike the Japanese archipelago, traveling on the Westerlies, just like yellow dust and PM2.5. A nightmarish scene of the islands contaminated with radioactivity, like that from the movies, will become a reality, and the Japanese islands and its citizens will experience radioactive contamination. If the radioactivity is high, Japan as a country will cease to exist. There is nowhere to run like in Chernobyl. Where is there a place where 120 million Japanese citizens can emigrate to?

I’m not trying to fan the flames of crisis without reason. This may have a higher likelihood of occurring than a nuclear disaster caused by being on an active faultline or the massive triple earthquakes anticipated in the Tokai region. And what I would like to say is that it is likely necessary that the public prepares itself for this level of risk.

Moreover, not only does Japan, and the countries of the world, not possess the scientific technologies to avoid such circumstances, but especially in the case of Japan, the country is extremely weak in disaster responses to potential missile attacks and terrorist acts against nuclear power facilities, whether it be because they don’t want to think about it, or because they

couldn't care less. As a country, it in a situation where it cannot even take responsibility for the safety of its citizens, much less conserving the environment; this is a fact that each one of us must properly grasp. And if we find this troubling, we must, as citizens, change the politics of the country.

On a different level from disaster response, nuclear power poses another serious problem in its lack of a solution in the disposal of spent fuel. How, and who, will manage these "spent nuclear waste," which requires 100,000 years or even more before the radioactivity diminishes to safe levels? And to begin with, where will they be finally disposed? In Japan, there aren't even potential locations for a disposal site.

Moreover, there is another problem before even considering disposal. To begin with, approximately 1,000 tons of spent fuel is produced by nuclear power plants each year (in Japan). Storage pools around the country (which has a carrying capacity of six more years) and the intermediate storage facility at Rokkasho village in Aomori prefecture (full) are filling to the brim, and there is nowhere for these fuels to go. Because all nuclear reactors are shut down except for two at the Ooi Plant, the storage pools have as a result been given an extension on their lives, and some in the industry even say this has helped their predicament.

The inability to circumvent the risks of an accident, a war, or a terrorist attack, and not having a solution to the problem of nuclear waste disposal signifies that nuclear power cannot be managed or controlled by human hands using existing scientific technology. To continue using nuclear power is to leave a legacy of burden to our grandchildren's and future generations, where they will have to pay the price.

For these reasons, the only plausible conclusion is that our only choice is to build a sustainable society that doesn't depend on nuclear power. This is not a matter of our likes/dislikes, ideology, or values. This is the only conclusion based on a scientific evaluation of risks. In this sense, there is no room for debating the continuation or abolishment of nuclear power. When asked, "when should Japan leave nuclear power behind," I would want to answer, "Shouldn't it be now?" But at the very least, there should be a determination of an end date. And in order to fill the hole left behind by nuclear power, we need to bring to fruition new forms of alternative energies like renewable energies, shale gas, and methane hydrate, instead of talking about those things as if we were repeating prayer verses.

Because Japan is the very country that experienced the disaster at the Fukushima Dai-ichi Nuclear Plant, it has the power to convince the world by declaring a break from the fantasy that is the peaceful use of nuclear power. It has the technological potential to lead the world in the two fields of "alternative energy development" and "spent fuel disposal," so there is no question it can accomplish these feats.

M, W263

I fear that there is an extremely large volume of environmental strategies that are only that in name or on the surface, which hide behind the shield of economic reasons. Politicians and large corporations need to face up to the fact that delaying the implementation of strategies until the future is only running from their own political responsibility.

Norichika Kanie, Tokyo Institute of Technology, W272

The future, in which we not only have to grapple with climate change as a global environmental problem, but also problems with the atmosphere, and water, is approaching. Japan must make the most of its past experiences and aggressively contribute to the preservation of the Earth's environment.

M, W314

In Japan, we act as if global environmental problems, particularly climate change, has gone away ever since the Great East Japan Earthquake and the disaster at the Fukushima Dai-ichi Nuclear Power Plant. But in the meantime, the Earth's environment is steadily deteriorating. But Japan has dug deeper in its tendency to look inwards, and has left the front lines of an international society that was grappling with these problems. No one will take seriously a country whose contribution is limited to selling energy conservation technology.

Toru Ishii, Senior Staff Writer, Asahi Shimbun, W347

Ever since the Great East Japan Earthquake, society's interest in disaster prevention and response seems to continue climbing whereas interest in global environmental problems is taken lightly. We cannot forget that changes in the Earth's environment and delays in response will only augment the damage.

F, W353

I don't think that there will be big changes to environmental problems within Japan, either for the better or the worse, with the exception of the problem of radioactive substances. However, the effects of environmental contamination in neighboring countries is likely to grow more serious. Therefore, we ought to export the environmental conservation and improvement technologies that we have in our country to developing countries, especially those in Asia, to try to resolve and ameliorate environmental problems.

M, W366

[Advancing the Building of International Endeavors and Mechanisms, the Role of the United Nations]

It is necessary to increase the frequency with which international conferences about the global environment take place, as well as to implement a system that makes it easier to execute international agreements (regulations, figures). In addition, it is important to raise the environmental awareness of the citizens of the world, across borders, through strategies like the timely presentation of progress reports through the internet. In the future, there needs to be an environmental monitoring group at the United Nations, with powers to enforce regulations in countries that have yet to do so.

Naofumi Yokoyama, Director, Kankyo Keizaijin Committee, 097

We are approaching the limits of a cookie cutter system based on cities, countries, and the capitalist economy. Rather than implementing superficial strategies, it is essential to put together a model for sustainable regions as soon as possible, taking the Earth as our example, with the understanding that the fundamental strategy will be constructed on practical grounds with the United Nations as the cornerstone. Considering individual responses outside of these prerequisites will not be effective. What is important is a clear picture of the future goals of the globe and the regions, and to take the steps to back into those objectives. The fundamental elements of that goal is what we call environmental cities.

Yukihisa Takei, Professor, Department of Civil Engineering, Fukui National College of Technology, 161

I am also concerned about the movements of chemical substances (including radioactive substances) and viruses caused by transnational pollution.

M, 165

The advancement of globalization is making the solution of environmental problems more difficult. In order to solve global environmental problems, we must have a global interests in mind. But negotiations for solutions are carried out by representatives of countries, who see things from the standpoint of national interests. In this model, there are no solutions that align global interests with national interests. The same can be said about international organizations, which must operate by adjusting national interests. What is necessary is glocalization (the globalization of local interests), though which new mechanisms for solutions are built that allow for the sharing of knowledge and understanding among disparate local regions, allowing for "separate but together" (the integration of diversity), and local areas that are made universal.

Takashi Gunjima, Professor, Department of Economics, Doshisha University, 168

Due to the large disparities in the birth rates between developing and developed regions, some estimates say that by 2050, approximately 80% of the world's population will reside in developing countries. This is a situation that makes the solution of global environmental problems extremely difficult. While it is important to put policies into place that have a direct effect on the environment, like energy reforms and the spread of renewable energies. I also think it is necessary to reconsider an international mechanism that promotes and encourages the sustainable development of each developing country (in particular, the solution of poverty, economic development that takes the environment into account).

M, W169

Global environmental problems are extremely pressing for the healthy continuation of human life and all forms of life on Earth. International and widespread efforts to remove nuclear waste and other poisonous substances without preconceptions are indispensable, so that we are not made to panic should unanticipated circumstances arise.

M, W177

With the atmospheric pollution of PM2.5, there have been some murmurs about the problem of transnational pollution. But we are already seeing the limits to environmental strategies that only address issues within a country's own borders, including the prevention of global warming. Therefore, I hope for the urgent consideration of a framework that allows for countries to share technologies well.

M, 191

Many environmental problems, like the effects of global warming, atmospheric and water pollution, and energy development, is spreading on a global scale that transcends national borders. Countries can no longer solve them by individually implementing measures on their own. It is necessary to share information, and build a framework in which countries can collaborate together on measures. For example, one approach to combat global warming may result in an environmental burden in another field. Rather than an accumulation of one-dimensional strategies to individual problems, we must think about environmental problems as a whole. In addition, we cannot stop at the country level; without an increase each person's awareness, we will not arrive at a fundamental solution.

Yumi Nakayama, Staff Writer, Special Reports, Asahi Shimbun, W214

This is a problem that will not change based on my personal opinion. It is something that needs to be considered at the global level, at nation states and at the United Nations. I do sense that something concrete is changing, as with weather extremities.

We need urgent measures.

M, W220

The reality, that various environmental problems are interrelated in complex ways that affect each other, must become a shared understanding of the globalized society.

Ryuichi Nakajima, Professor, Department of Economics, Meikai University, W261

In order to implement climate change policies, it is likely necessary to have powerful leadership on a global level. There is no time to waste. We need to put into place all strategies as soon as possible. From a global perspective, the development of China is remarkable, but it is clear that the country will also have many environmental problems at the same time. Developed countries should aggressively pursue technological assistance. Further, the problem of conflict minerals is also extremely important in achieving sustainable development. Because these problems are largely caused by the scramble for resources, it seems that it can not be solved without the creation of a system to share the various resources across the world?

M, W285

We are in a global era. A diverse range of information flies across the universe night and day, and both the distribution of people and commodities live under a fierce social and economic system. In addition, various environmental problems, differing in quantity and quality, are occurring across the world regardless of the country's development status, with the possibility that new problems will sprout in the future. In order to appropriately respond to these environmental problems, I think that a global and open-minded sharing of information, the pursuit of causes, and the development and implementation of policies would be most effective and efficient even if it is to address an individual problem. Japan is an island country. It is a beautiful country full of peace of mind. It is well organized. But how is it when seen from a global perspective? I think that we need even more global thinking and perspective. The foundation of global environmental policies is people. I believe that the intimate cooperation and collaboration between and among people, regions, and countries is most essential.

Hidetsuru Matsushita, W315

There is a natural limit to the number of people that can be nourished on this Earth, and it can be said that the current population growth rate is at crisis levels. Although climate change and global warming, and the related decrease of water resources and agricultural land may accelerate the arrival to that limit, it will never slow down the process. I fear that the current situation, in which each country is focused on prioritizing its own economic policies, would make inevitable a scenario where each country faces the precipitous approach of critical levels of food insecurity rooted in environmental causes, and without being able to find a definitive solution, face deprivation. Researchers need to continue their work anticipating this scenario. But in the end, what will be necessary is a international political decision. But there is no issue like food security that puts national interests at the forefront, and I feel that an extremely hopeless scenario can be anticipated.

M, W355

V. Data

1. AWARENESS OF THE CRISIS FACING HUMAN SURVIVAL—ENVIRONMENTAL DOOMSDAY CLOCK

To what extent do you feel that the current deterioration of the environment has created a crisis that will affect the survival of the human race? Please select three environmental issues of greatest concern from the chart below, and write a time for each category within the range of 0:01 to 12:00 corresponding to the extent of your concern. In selecting a time, please use units of 10 minutes for ease of calculation.

Rank 1 Category

Unit: %

| | Overall | U.S.A. & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|-----------------------------|---------|-----------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| 1. Climate Change | 40 | 61 | 24 | 42 | 23 | 61 | 25 | 30 | 21 | 50 | 44 | 42 | 48 | 60 |
| 2. Biodiversity | 6 | 4 | 8 | 7 | 5 | 15 | 0 | 0 | 2 | 7 | 17 | 8 | 6 | 13 |
| 3. Land Use | 3 | 4 | 8 | 2 | 5 | 0 | 0 | 5 | 3 | 5 | 5 | 2 | 4 | 0 |
| 4. Pollution/Contamination | 14 | 5 | 11 | 6 | 5 | 3 | 13 | 5 | 34 | 13 | 2 | 11 | 6 | 0 |
| 5. Water Resources | 8 | 7 | 11 | 5 | 9 | 0 | 25 | 30 | 13 | 5 | 7 | 5 | 14 | 0 |
| 6. Population | 8 | 7 | 11 | 19 | 9 | 3 | 13 | 5 | 2 | 4 | 0 | 12 | 4 | 7 |
| 7. Food | 3 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 | 3 | 7 | 4 | 2 | 0 |
| 8. Lifestyles | 3 | 2 | 3 | 3 | 14 | 3 | 0 | 5 | 1 | 0 | 5 | 2 | 10 | 7 |
| 9. Global Warming Measures | 3 | 4 | 11 | 2 | 5 | 0 | 25 | 0 | 2 | 3 | 2 | 4 | 2 | 0 |
| 10. Environment and Economy | 3 | 1 | 8 | 6 | 9 | 3 | 0 | 10 | 2 | 8 | 2 | 3 | 0 | 7 |
| 11. Environment and Society | 2 | 1 | 3 | 4 | 9 | 3 | 0 | 5 | 1 | 1 | 7 | 1 | 2 | 0 |
| 12. Other | 2 | 2 | 0 | 0 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 7 |
| No Response | 5 | 5 | 3 | 3 | 5 | 6 | 0 | 5 | 17 | 1 | 0 | 1 | 2 | 0 |
| Number of Responses | [1292] | [102] | [37] | [105] | [21] | [31] | [8] | [19] | [229] | [75] | [40] | [559] | [49] | [15] |
| Time for Rank 1 Category | 9:49 | 10:40 | 9:58 | 10:04 | 9:59 | 9:59 | 9:59 | 9:47 | 9:55 | 9:38 | 9:51 | 9:34 | 9:46 | 10:44 |

- Climate Change..... Atmospheric concentration of CO₂; global warming; ocean acidification; climatic aberrations (droughts, torrential rains and flooding, severe storms, heavy snow, abnormal temperatures, drying of rivers and lakes, desertification, etc.)
- Biodiversity..... Acceleration of species extinction; effects of contamination, climate change, land use
- Land Use..... Expansion of cultivated land mass; destruction of forests due to erratic development; desertification caused by overgrazing; agriculture and land use without regard for the environment; urbanization
- Pollution/Contamination..... River and ocean pollution; eutrophication caused by excessive nitrogen and phosphorus and contamination by chemical substances; atmospheric pollution: particulates suspended in the atmosphere, soot and chemical substances
- Water Resources..... Diminution of usable fresh water resources (depletion, contamination)
- Population..... Population growth beyond what the Earth can support; aging of the population
- Food..... Diminution of food supply from land and oceans
- Lifestyles..... Transformation of lifestyles away from excessive consumption of resources like energy
- Global Warming Measures..... Progress of measures for mitigation and adaption
- Environment and Economy..... Progress towards an economic system to reflect environmental costs, e.g., social costs: taxes for fossil fuels that emit CO₂, which cause global warming-related damages; TEEB (The Economics of Ecosystems and Biodiversity), etc. An environmentally conscious economy: realization of green economy, sustainable economic development, etc
- Environment and Society..... Environmental awareness at the individual and societal levels, progress of environmental education; poverty; the status of women

Rank 2 Category

Unit: %

| | Overall | U.S.A. & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|-----------------------------|---------|-----------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| 1. Climate Change | 13 | 13 | 16 | 20 | 5 | 6 | 25 | 10 | 11 | 14 | 22 | 11 | 12 | 20 |
| 2. Biodiversity | 9 | 20 | 13 | 12 | 0 | 15 | 0 | 5 | 3 | 4 | 10 | 11 | 6 | 7 |
| 3. Land Use | 9 | 7 | 5 | 13 | 18 | 21 | 13 | 10 | 10 | 17 | 5 | 6 | 6 | 7 |
| 4. Pollution/Contamination | 15 | 6 | 18 | 6 | 14 | 9 | 25 | 25 | 18 | 28 | 12 | 16 | 22 | 7 |
| 5. Water Resources | 15 | 18 | 24 | 15 | 27 | 18 | 25 | 30 | 18 | 13 | 15 | 12 | 16 | 7 |
| 6. Population | 9 | 19 | 13 | 8 | 5 | 6 | 13 | 5 | 4 | 4 | 7 | 11 | 4 | 13 |
| 7. Food | 8 | 2 | 5 | 3 | 0 | 6 | 0 | 0 | 7 | 3 | 5 | 13 | 4 | 0 |
| 8. Lifestyles | 5 | 2 | 3 | 10 | 5 | 3 | 0 | 5 | 4 | 4 | 15 | 5 | 2 | 13 |
| 9. Global Warming Measures | 3 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 5 | 6 | 0 |
| 10. Environment and Economy | 5 | 6 | 0 | 5 | 23 | 6 | 0 | 5 | 4 | 5 | 0 | 4 | 14 | 20 |
| 11. Environment and Society | 3 | 2 | 0 | 2 | 0 | 3 | 0 | 0 | 2 | 1 | 5 | 3 | 4 | 7 |
| 12. Other | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 0 |
| No Response | 5 | 5 | 3 | 3 | 5 | 6 | 0 | 5 | 17 | 1 | 0 | 1 | 2 | 0 |
| Number of Responses | [1292] | [102] | [37] | [105] | [21] | [31] | [8] | [19] | [229] | [75] | [40] | [559] | [49] | [15] |
| Time for Rank 1 Category | 9:03 | 10:00 | 9:48 | 9:28 | 9:36 | 9:31 | 8:33 | 9:18 | 8:50 | 8:19 | 9:11 | 8:49 | 9:28 | 9:26 |

Rank 3 Category

Unit:%

| | Overall | U.S.A. & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|-----------------------------|---------|-----------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| 1. Climate Change | 9 | 4 | 13 | 5 | 18 | 0 | 13 | 15 | 8 | 14 | 10 | 10 | 8 | 0 |
| 2. Biodiversity | 9 | 8 | 5 | 13 | 9 | 9 | 0 | 10 | 6 | 7 | 7 | 9 | 18 | 27 |
| 3. Land Use | 8 | 9 | 13 | 11 | 0 | 15 | 0 | 25 | 8 | 5 | 5 | 7 | 12 | 20 |
| 4. Pollution/Contamination | 12 | 11 | 13 | 13 | 14 | 6 | 13 | 0 | 8 | 18 | 12 | 14 | 8 | 7 |
| 5. Water Resources | 12 | 21 | 13 | 14 | 14 | 12 | 0 | 10 | 8 | 8 | 12 | 11 | 22 | 7 |
| 6. Population | 10 | 11 | 13 | 11 | 0 | 6 | 13 | 5 | 5 | 12 | 7 | 12 | 8 | 13 |
| 7. Food | 7 | 5 | 3 | 4 | 9 | 9 | 13 | 15 | 4 | 5 | 12 | 9 | 2 | 7 |
| 8. Lifestyles | 7 | 9 | 8 | 7 | 9 | 6 | 13 | 0 | 6 | 12 | 7 | 7 | 6 | 0 |
| 9. Global Warming Measures | 3 | 3 | 8 | 4 | 9 | 0 | 13 | 0 | 0 | 3 | 5 | 3 | 4 | 0 |
| 10. Environment and Economy | 7 | 6 | 5 | 6 | 0 | 21 | 13 | 5 | 5 | 12 | 10 | 7 | 6 | 7 |
| 11. Environment and Society | 6 | 6 | 3 | 6 | 14 | 6 | 13 | 10 | 4 | 3 | 10 | 8 | 4 | 13 |
| 12. Other | 1 | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| No Response | 9 | 5 | 3 | 3 | 5 | 6 | 0 | 5 | 37 | 1 | 2 | 1 | 2 | 0 |
| Number of Responses | [1292] | [102] | [37] | [105] | [21] | [31] | [8] | [19] | [229] | [75] | [40] | [559] | [49] | [15] |
| Time for Rank 1 Category | 8:29 | 9:42 | 9:12 | 8:58 | 9:41 | 9:15 | 7:56 | 8:49 | 8:18 | 6:41 | 9:09 | 8:14 | 8:49 | 9:03 |

2. CITIES AND ENVIRONMENTAL PROBLEMS

Estimates say that at present, nearly 70% of the world's carbon dioxide emissions are produced in urban areas. In addition, more than half of the world's 7.1 billion people live in cities. The urban population is projected to continue growing rapidly, and according to the United Nations, the percentage of the population living in cities will reach approximately 70 percent by 2050, to 6.4 billion people. This trend, of the rise in the urban population, is particularly pronounced in developing regions like Asia and Africa, where issues similar to developed regions, like environmental problems and poverty, are arising. In considering environmental problems and finding solutions to them, the importance of cities is growing significantly. The following sections will explore problems relating to cities and their environment.

2-1. Please select two items from the categories A through F listed below that you think are the most important elements in improving the urban environment in the country or region where you reside.

Unit:%

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|--|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| A.The construction of urban infrastructure | 51 | 53 | 47 | 53 | 55 | 39 | 75 | 40 | 52 | 63 | 46 | 50 | 36 | 73 |
| B.Education on urban environmental problems and sharing in the recognition of problems | 41 | 30 | 42 | 31 | 9 | 39 | 13 | 40 | 31 | 49 | 61 | 48 | 42 | 20 |
| C.The active participation and cooperation of multiple stakeholders | 46 | 54 | 53 | 46 | 77 | 61 | 38 | 60 | 43 | 26 | 49 | 45 | 54 | 47 |
| D.Regulations by city governments | 35 | 34 | 29 | 40 | 32 | 39 | 38 | 40 | 44 | 43 | 37 | 28 | 48 | 40 |
| E.Financial incentives by city governments | 19 | 16 | 24 | 16 | 23 | 12 | 38 | 20 | 23 | 17 | 5 | 21 | 10 | 13 |
| F.Otehr | 7 | 13 | 5 | 12 | 5 | 6 | 0 | 0 | 3 | 1 | 2 | 7 | 10 | 7 |
| Unknown | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

2-2. In order to mitigate the environmental burden, what would you like to see in the measures and strategies implemented by government agencies? Please select three items from the categories A through M listed below. (For respondents who do not reside in urban areas, please select your responses based on your understanding and knowledge of the situation.)

Unit:%

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|--|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| A.Stringent standards for auto emissions and energy waste | 27 | 25 | 21 | 31 | 18 | 9 | 0 | 10 | 47 | 25 | 71 | 19 | 16 | 20 |
| B.Stringent standards regulating discharge of gas, water, and waste from factories, offices, homes | 36 | 27 | 34 | 31 | 36 | 42 | 63 | 45 | 39 | 50 | 56 | 34 | 36 | 53 |
| C.Energy conservation standards for city buildings and structures (insulation of walls, roofs, and windows, greening of roofs) | 25 | 33 | 11 | 45 | 36 | 12 | 25 | 10 | 20 | 9 | 51 | 24 | 20 | 47 |
| D.Incentives for energy conservation products and construction | 15 | 18 | 16 | 12 | 18 | 24 | 38 | 10 | 17 | 16 | 12 | 14 | 18 | 7 |
| E. Labeling energy conservation products | 7 | 2 | 3 | 9 | 14 | 9 | 25 | 10 | 4 | 20 | 5 | 6 | 2 | 13 |
| F. Urban greening (of roofs, walls, train tracks) | 19 | 15 | 18 | 19 | 27 | 18 | 13 | 20 | 25 | 16 | 17 | 17 | 22 | 7 |
| G. Optimization of transportation networks and transportation information systems | 27 | 43 | 47 | 30 | 32 | 15 | 25 | 15 | 24 | 14 | 10 | 28 | 30 | 27 |
| H. Improvements in electricity infrastructure | 28 | 30 | 11 | 18 | 14 | 30 | 25 | 10 | 9 | 34 | 12 | 42 | 16 | 40 |
| I. Improvements in waste/waste water treatment infrastructure | 27 | 11 | 26 | 15 | 23 | 27 | 25 | 55 | 41 | 26 | 20 | 25 | 42 | 13 |
| J. Urban planning that strongly incorporates nature | 39 | 43 | 37 | 41 | 27 | 30 | 25 | 45 | 31 | 45 | 20 | 44 | 32 | 40 |
| K. Strengthening environmental education (energy/resource conservation, pollution prevention) | 29 | 18 | 37 | 26 | 23 | 42 | 13 | 35 | 22 | 32 | 15 | 33 | 36 | 13 |
| L. Strengthening anti-poverty measures | 13 | 19 | 37 | 15 | 27 | 36 | 25 | 25 | 9 | 12 | 7 | 9 | 28 | 13 |
| M.Other | 4 | 11 | 3 | 6 | 5 | 0 | 0 | 5 | 1 | 1 | 5 | 5 | 2 | 7 |
| Unknown | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

2-3. In order to achieve sustainable cities and reduce the emissions of carbon dioxide, what do you think will become the most important technology, product, or system? Please select three items from the categories A through L below.

Unit: %

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|--|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| A. Recovering exhaust heat from water and gas emissions from factory/office/home | 33 | 18 | 21 | 21 | 9 | 21 | 38 | 20 | 51 | 50 | 29 | 31 | 28 | 27 |
| B. Recovering resources from waste from factory/office/home | 34 | 26 | 37 | 23 | 36 | 27 | 25 | 45 | 38 | 14 | 46 | 37 | 38 | 20 |
| C. Recyclable energy technology | 69 | 72 | 68 | 69 | 64 | 76 | 88 | 70 | 62 | 53 | 78 | 73 | 66 | 60 |
| D. Low pollution automotive engines | 27 | 34 | 39 | 29 | 36 | 30 | 25 | 30 | 39 | 45 | 27 | 15 | 24 | 27 |
| E. Automotive transportation management systems | 14 | 8 | 18 | 8 | 14 | 24 | 13 | 10 | 15 | 17 | 7 | 14 | 20 | 0 |
| F. Public transportation systems | 43 | 53 | 71 | 65 | 36 | 42 | 75 | 40 | 33 | 43 | 39 | 37 | 64 | 67 |
| G. Energy conservation products | 26 | 25 | 26 | 31 | 36 | 45 | 13 | 45 | 26 | 26 | 32 | 21 | 36 | 40 |
| H. Home energy storage technology | 12 | 10 | 3 | 15 | 27 | 18 | 13 | 10 | 8 | 1 | 10 | 15 | 6 | 13 |
| I. Smart grid systems | 18 | 15 | 13 | 15 | 9 | 12 | 0 | 5 | 9 | 21 | 7 | 26 | 10 | 13 |
| J. Insulation technologies | 12 | 14 | 0 | 20 | 18 | 0 | 13 | 5 | 6 | 16 | 20 | 15 | 2 | 13 |
| K. Permeable pavement technologies | 5 | 7 | 3 | 0 | 5 | 0 | 0 | 5 | 3 | 12 | 0 | 7 | 6 | 0 |
| L. Other | 4 | 13 | 0 | 3 | 9 | 3 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 20 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

2-4. The world's urban population is expected to continue growing, with the growth particularly pronounced in developing regions like Asia and Africa. Given this circumstance, what do you think are the important elements when considering future responses to the world's urban environmental problems? Please select two items from the categories A through G below.

Unit:%

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|---|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| A. Solution of urban poverty | 43 | 39 | 34 | 44 | 45 | 55 | 38 | 35 | 51 | 36 | 46 | 40 | 48 | 40 |
| B. Solutions to urban environmental problems that align with developing region realities | 50 | 58 | 53 | 56 | 27 | 42 | 38 | 40 | 33 | 53 | 71 | 55 | 54 | 60 |
| C. Technological transfers and sharing of know-how of excellent environmental and anti-pollution measures | 36 | 27 | 32 | 36 | 36 | 36 | 50 | 50 | 50 | 30 | 29 | 31 | 34 | 27 |
| D. Environmental education | 34 | 22 | 42 | 33 | 50 | 42 | 50 | 40 | 29 | 39 | 17 | 38 | 28 | 27 |
| E. Active involvement of central government and the U.N. on urban environmental problems | 12 | 8 | 8 | 8 | 23 | 6 | 0 | 5 | 10 | 11 | 12 | 16 | 14 | 13 |
| F. Urban environmental governance that sufficiently considers effects on neighboring ecosystems | 20 | 23 | 24 | 14 | 14 | 15 | 25 | 25 | 23 | 32 | 20 | 16 | 20 | 27 |
| G. Other | 4 | 21 | 8 | 9 | 5 | 3 | 0 | 5 | 1 | 0 | 0 | 2 | 2 | 7 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

Respondent Affiliation

Employment

Unit: %

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|------------------------------------|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| 1. Central government | 5 | 2 | 11 | 4 | 9 | 15 | 13 | 5 | 9 | 9 | 0 | 2 | 14 | 7 |
| 2. Local government | 11 | 1 | 3 | 1 | 0 | 0 | 0 | 5 | 33 | 18 | 5 | 7 | 0 | 0 |
| 3. University/research institution | 41 | 27 | 47 | 39 | 50 | 21 | 38 | 50 | 28 | 26 | 20 | 55 | 36 | 33 |
| 4. Nongovernmental Organization | 14 | 21 | 26 | 24 | 32 | 48 | 50 | 20 | 3 | 21 | 49 | 7 | 36 | 33 |
| 5. Corporation | 11 | 4 | 3 | 6 | 0 | 0 | 0 | 0 | 20 | 22 | 15 | 11 | 2 | 7 |
| 6. Journalism | 4 | 21 | 3 | 2 | 0 | 0 | 0 | 10 | 1 | 0 | 2 | 4 | 4 | 0 |
| 7. Other | 12 | 24 | 8 | 23 | 9 | 15 | 0 | 10 | 4 | 1 | 10 | 13 | 6 | 20 |
| No response | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 2 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

Gender

Unit: %

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|-------------|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| Male | 75 | 69 | 79 | 69 | 68 | 82 | 88 | 70 | 57 | 66 | 41 | 91 | 76 | 73 |
| Female | 23 | 31 | 21 | 31 | 32 | 18 | 13 | 30 | 41 | 33 | 59 | 8 | 24 | 27 |
| No response | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

Age

Unit: %

| | Total | United States & Canada | Latin America | Western Europe | Eastern Europe & former Soviet Union | Africa | Middle East | India | China | Taiwan | Korea | Japan | Asian Region* | Oceania |
|-------------|--------|------------------------|---------------|----------------|--------------------------------------|--------|-------------|-------|-------|--------|-------|-------|---------------|---------|
| | [1364] | [107] | [38] | [108] | [22] | [33] | [8] | [20] | [277] | [76] | [41] | [566] | [50] | [15] |
| 20s | 14 | 7 | 11 | 2 | 0 | 6 | 0 | 5 | 49 | 26 | 17 | 1 | 6 | 0 |
| 30s | 15 | 9 | 5 | 15 | 9 | 18 | 25 | 10 | 25 | 26 | 44 | 8 | 26 | 13 |
| 40s | 17 | 11 | 24 | 19 | 18 | 48 | 0 | 15 | 8 | 29 | 20 | 16 | 30 | 20 |
| 50s | 21 | 22 | 29 | 19 | 36 | 15 | 25 | 35 | 1 | 12 | 15 | 31 | 18 | 13 |
| 60s | 20 | 26 | 26 | 32 | 18 | 9 | 25 | 5 | 0 | 5 | 5 | 30 | 10 | 33 |
| Over 70 | 10 | 24 | 5 | 12 | 18 | 3 | 25 | 30 | 0 | 0 | 0 | 12 | 8 | 20 |
| No response | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 1 | 0 | 1 | 2 | 0 |

*With the exception of India, China, Taiwan, Korea, and Japan

About "Number of responses" and "no response"

Number of responses counted the number of valid responses, which consisted of either single answers or when the question asked for multiple responses, selections made under the requested number of choices. When there were more responses than the number requested, the response was invalidated.

No response: Respondent did not provide a selection.

VI. Questionnaire as Distributed to Respondents

I. REPEAT TOPICS

In determining the time, we ask you to first select three categories of environmental issues of greatest concern with prioritization. Then, please indicate a time on the Environmental Doomsday Clock for each category.

1. The Effects of Climate Change

To what extent do you feel that the current deterioration of the environment has created a crisis that will affect the survival of the human race? Please select three environmental issues of greatest concern from the table below, and write a time for each category within the range of 0:01 to 12:00 corresponding to the extent of your concern. In selecting a time, please use units of 10 minutes for ease of calculation.

Example

| | | | | | | | | |
|--------------------------|--------------------------------|------|---------------------------------|--------------------------|---------------------------|----------------------|----------------------|----------------------|
| Category Number | | TIME | | | | Category Number | | TIME |
| First (1.) | <input type="text" value="9"/> | : | <input type="text" value="30"/> | | First () | <input type="text"/> | : | <input type="text"/> |
| (of the first magnitude) | | | | | Second () | <input type="text"/> | : | <input type="text"/> |
| Second (5.) | <input type="text" value="7"/> | : | <input type="text" value="40"/> | | (of the second magnitude) | | | |
| Third (3.) | <input type="text" value="8"/> | : | <input type="text" value="20"/> | Third () | <input type="text"/> | : | <input type="text"/> | |
| (of the third magnitude) | | | | (of the third magnitude) | | | | |

About the calculation of the time on the Environmental Doomsday Clock

The time on the Environmental Doomsday Clock will be determined by taking the weighted average of the data. The issue ranked in first place will be weighted at 50%, second place at 30%, and third place at 20%. In the example shown, the time comes to 8:43.

Table. Environmental Issues Considered in This Year's Questionnaire

| Category | Main Elements |
|------------------------------|--|
| 1. Climate Change | Atmospheric concentration of CO ₂ ; global warming; ocean acidification; climatic aberrations (droughts, torrential rains and flooding, severe storms, heavy snow, abnormal temperatures, drying of rivers and lakes, desertification, etc.) |
| 2. Biodiversity | Acceleration of species extinction; effects of contamination, climate change, land use |
| 3. Land Use | Expansion of cultivated land mass; destruction of forests due to erratic development; desertification caused by overgrazing; agriculture and land use without regard for the environment; urbanization |
| 4. Pollution / Contamination | River and ocean pollution: eutrophication caused by excessive nitrogen and phosphorus and contamination by chemical substances; atmospheric pollution: particulates suspended in the atmosphere, soot and chemical substances |
| 5. Water Resources | Diminution of usable fresh water resources (depletion, contamination) |
| 6. Population | Population growth beyond what the Earth can support; aging of the population |
| 7. Food | Diminution of food supply from land and oceans |
| 8. Lifestyles | Transformation of lifestyles away from excessive consumption of resources like energy |
| 9. Global Warming Measures | Progress of measures for mitigation and adaption |
| 10. Environment and Economy | Progress towards implementing an economic system to reflect environmental costs, the bearing of social costs: imposition of taxes for fossil fuels that emit CO ₂ , which cause global warming-related damages; TEEB (The Economics of Ecosystems and Biodiversity), etc. The operation of an environmentally conscious economy: the realization of a green economy, sustainable economic development, etc. |
| 11. Environment and Society | Environmental awareness at the individual and societal levels, progress of environmental education; poverty; the status of women |
| 12. Other | () |

- C. Renewable energy technology (solar batteries, micro wind turbines, micro hydro power, biomass, heat sink technology, geothermal heat pump technology, etc.)
- D. Low pollution automotive engines (electric and hybrid vehicles, fuel cell technology, etc.)
- E. Automotive transportation management systems (traffic and congestion information, car sharing, rules regulating carpooling)
- F. Public transportation networks (strengthening public transportation systems like buses, trams, and trains)
- G. Energy conservation products (LED lighting, energy conserving air conditioning and heating, other energy conserving household electric products)
- H. Home energy storage technology
- I. Smart grid systems
- J. Thermal insulation technologies (walls, windows, e.g. double-pane windows, roofs)
- K. Permeable pavement technologies
- L. Other: Please specify. ()

2-4. The world’s urban population is expected to continue growing, with the growth particularly pronounced in developing regions like Asia and Africa. Given this circumstance, what do you think are the important elements when considering future responses to the world’s urban environmental problems? Please select two items from the categories A through G below.

Your selection: () ()

- A. Solution of urban poverty (the construction of infrastructure like housing, water supply and sewage systems, electricity, gas, and education)
- B. Solution of urban environmental problems that align with the realities in developing regions (not simply following the urban environmental responses of developed regions as examples, but exploring the optimal solution suited to developing regions)
- C. Technological transfers and the sharing of know-how of excellent environmental and anti-pollution measures (the propagation of environmental technologies and governance from environmentally progressive cities to cities needing the know-how)
- D. Environmental education (environmental pollution, energy conservation, energy creation, resource)
- E. Active involvement of the central government and the United Nations on urban environmental problems
- F. Urban environmental governance that takes into sufficient consideration the effects on ecosystems in neighboring locales
- G. Other: Please specify. ()

3. Feel free to write comments on any topic related to environmental problems.

**Results of the 22nd Annual
“Questionnaire on Environmental Problems and the Survival of Humankind”**

REPORT

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