

Questionnaire on Environmental Problems and the Survival of Humankind A 20-Year Summary Preview

—Environmental Doomsday Clock and Agenda 21—



September, 2012

af THE ASAHI GLASS FOUNDATION

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Introduction

Since the United Nations Conference on Environment and Development was held in Rio de Janeiro in 1992, the Asahi Glass Foundation has conducted the “Questionnaire on Environmental Problems and the Survival of Humankind” each year with environmental experts around the world. To date, we have surveyed more than 14,000 respondents in 174 countries worldwide on their opinions about the problems faced by the global environment.

In A 20-Year Preview Summary, we have highlighted “the Environmental Doomsday Clock,” an illustrative device attracting keen interest, as well as the continuous survey results on Agenda 21, the action plan adopted at the Rio Summit to achieve sustainable development. In addition, we have also featured a new approach to the Environmental Conditions of Concern in selecting the time on the Environmental Doomsday Clock, introduced in 2011 to capture changes in the global environment with an even clearer perspective.

This preview report was produced to introduce our questionnaire to participants at the IUCN World Conservation Congress to mark the 20th anniversary of the survey. The full report will be published as part of a series of books commemorating the 80th anniversary of the Asahi Glass Foundation, and will be available next year on the Foundation’s web site at [http:// www/af-info.or.jp](http://www/af-info.or.jp).

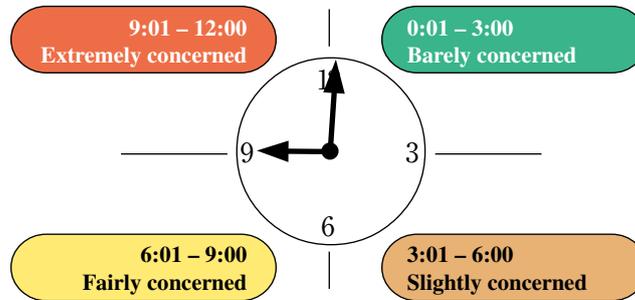
In the coming years, the Asahi Glass Foundation will continue to probe the world’s environmental experts for their opinions through the questionnaire. We ask for your continued understanding and cooperation in our endeavors.

September, 2012
The Asahi Glass Foundation

Survey Results

1. The Environmental Doomsday Clock

The Environmental Doomsday Clock is a survey item indicating the sense of crisis respondents feel about the continued survival of humankind given the deterioration of the environment. The degree of crisis is expressed by selecting a time on the clock, a device that the Foundation created independently.



I-1. The Average Global Time over the 20 Years of the Survey

The following diagram shows the average global time over the 20 years of the questionnaire. It responds to the question, “To what extent do you feel that the current deterioration of the global environment has created a crisis that will affect the survival of the human race? Write a time within the range 0:01 to 12:00 corresponding to the extent of your concern.”

The time on the Environmental Doomsday Clock has moved forward gradually since the inception of the survey in 1992. In 1996, the time entered the quadrant, “Extremely Concerned,” and with the exception of the year 2000, has consistently ranged in the nine o’clock hour.

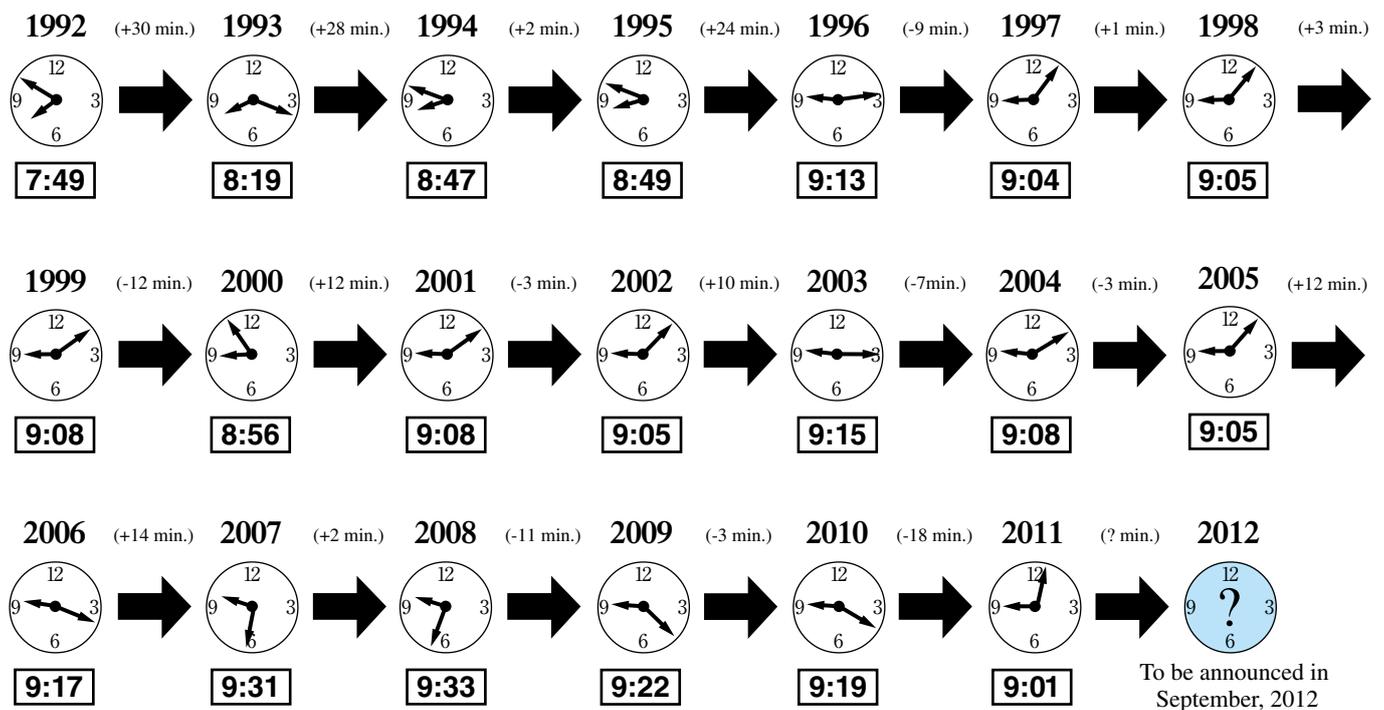


Figure-1 Changes in Time from Year to Year

I-2. The Average Time by Region

The following chart and graph indicates the time on the Environmental Doomsday Clock from 1992 to 2011 by region. The lowest sense of crisis in the 20 years of the survey came in 1993 from respondents in Eastern Europe and former Soviet Union, who gave an average time of 7:02. In contrast, the highest sense of crisis came from Middle East in 2010, at 10:47. Three regions have never entered the 10 o'clock hour: Asia including Japan, Western Europe, and Latin America.

Regions in the report are categorized as follows: Developed regions: The United States and Canada, Western Europe, Japan, Asian Four (South Korea, Hong Kong, Taiwan, and Singapore). Developing regions: Rest of Asia, Latin America, Africa, Others: Oceania, Eastern Europe and former Soviet Union, Middle East

Table-1 Changes in the Environmental Doomsday Clock (1992-2011)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Japan	7:38	7:33	8:01	8:08	8:51	8:42	9:01	9:07	8:56	9:04	9:18	9:20	9:06	9:07	9:15	9:34	9:42	9:08	9:09	8:46
United States & Canada	8:35	8:58	9:07	8:52	9:30	9:09	8:40	9:03	8:49	9:54	8:23	9:03	9:14	8:54	9:18	9:40	10:13	10:01	10:13	9:35
Western Europe	8:54	9:02	9:35	9:02	9:46	9:53	9:37	8:46	8:46	8:58	8:44	8:52	8:56	8:43	9:08	9:23	9:44	9:55	9:45	9:28
Asia	8:10	8:19	9:16	9:41	9:41	9:25	8:59	9:47	9:16	9:04	8:36	9:41	9:32	9:41	9:17	9:10	8:52	9:04	9:01	8:51
Latin America	8:57	8:37	9:37	9:23	9:28	9:26	9:04	9:14	8:52	9:00	9:22	9:19	9:12	9:08	9:31	9:38	9:49	9:28	9:48	9:18
Africa	8:10	8:43	9:14	9:33	9:25	9:15	9:08	9:13	9:17	9:37	9:29	9:22	9:04	9:03	9:32	10:02	10:31	10:15	10:24	9:09
Oceania	9:58	8:23	8:53	9:44	9:43	8:52	9:34	8:52	8:31	8:58	9:22	9:37	9:08	9:18	9:18	10:27	10:34	10:10	10:29	10:06
Eastern Europe & former Soviet Union	9:27	7:02	8:10	9:29	9:12	9:37	9:44	9:21	8:21	8:17	9:28	9:02	8:30	8:26	9:07	9:20	9:37	10:00	9:47	9:13
Middle East	8:10	8:12	—	9:09	8:30	9:33	8:47	9:32	9:38	9:01	8:02	8:52	8:41	9:18	10:05	9:41	9:24	9:42	10:47	10:24
Total	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

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

The graph below shows the time over 20 years across all regions. In all regions, the time moved from the 8 o'clock hour to the 9 o'clock hour in the 12 years from 1994 to 2005. As of 2006, Middle East, Africa, Oceania, and the United States and Canada moved from the 9 o'clock hour to the 10 o'clock hour, indicating a heightened sense of crisis in these four regions. However, the average overall time has been showing a gradual reversal since 2008.

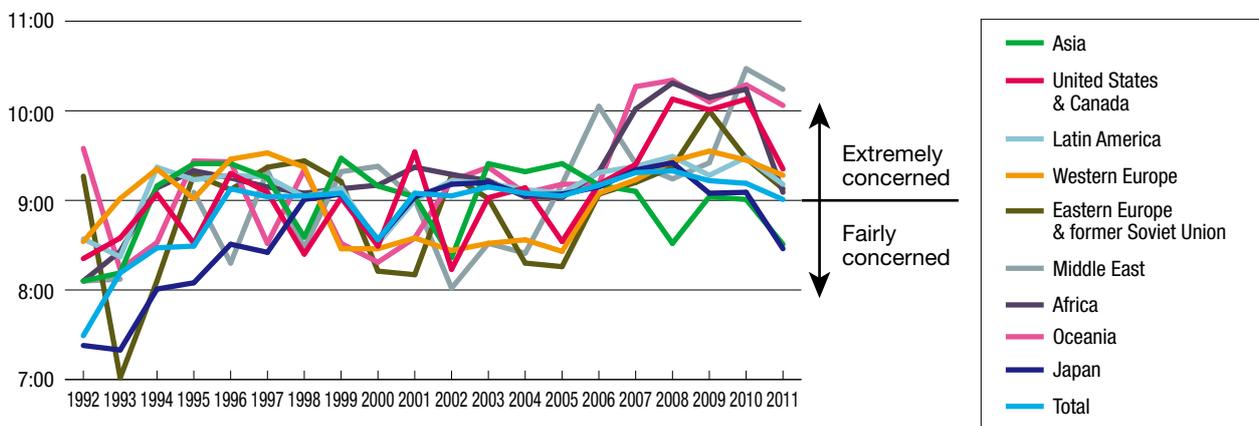


Figure-2 Changes in the Environmental Doomsday Clock (1992-2011)

The following diagram shows the movement of time on the Environmental Doomsday Clock in 10-year increments, by region, on a world map. In Western Europe (8:54 to 8:58 to 9:28), Middle East (8:10 to 9:01 to 10:24), and Latin America (8:57 to 9:00 to 9:18), the time has consistently moved forward with no reversals.

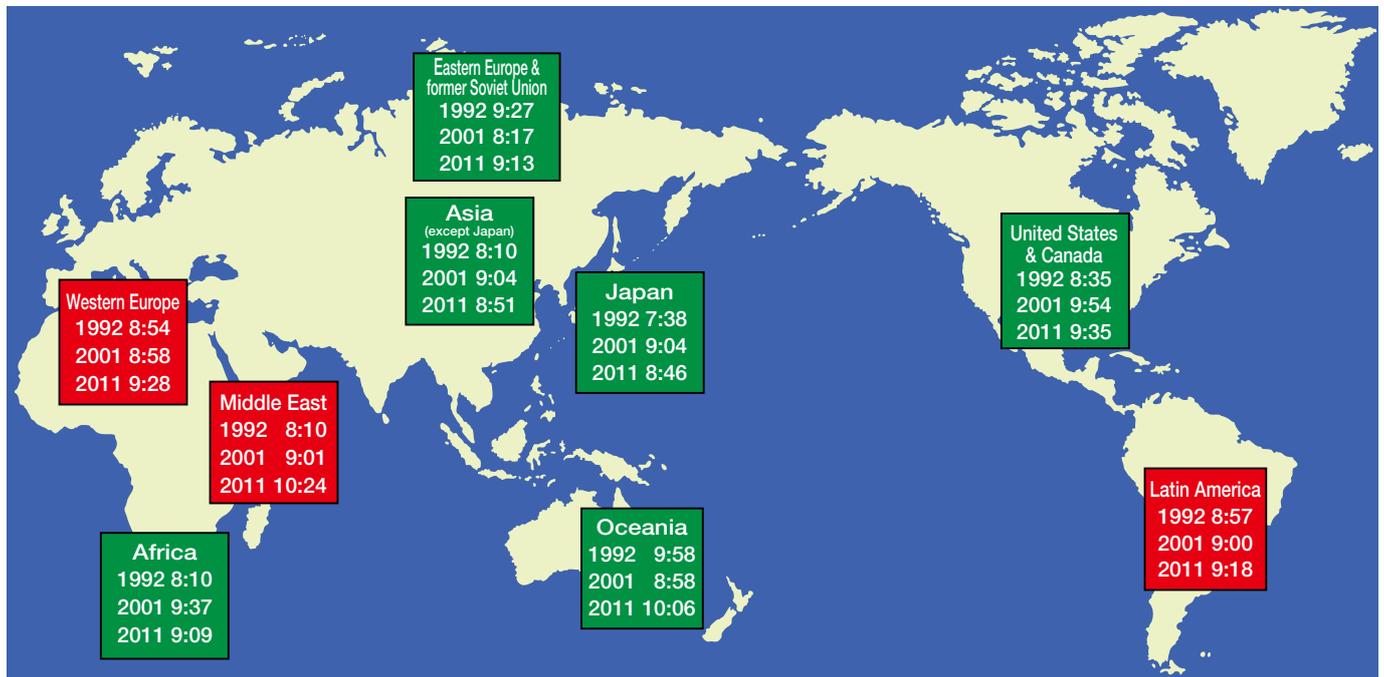


Figure-3 Regional Times (1992, 2001, 2011)

I-3 Environmental Conditions of Concern

Since 2003, the questionnaire has probed respondents about the environmental conditions of concern that influenced their selection of the time on the Environmental Doomsday Clock. The following chart shows the results from 2005, when respondents from all regions except Asia and Eastern Europe & former Soviet Union cited global warming either as the highest or the second highest environmental conditions of great concern.

Table-2 Environmental Conditions of Concern in Determining the Doomsday Clock Time (2005)

	Developed Regions				Developing Regions			Others			Overseas Total	Developed Regions	Developing Regions	Others	Total
	Japan	United States & Canada	Western Europe	Asian Four	Rest of Asia	Latin America	Africa	Oceania	Eastern Europe & former Soviet Union	Middle East					
General environmental problems	30	18	16	37	31	13	15	31	29	30	23	27	22	29	26
Global warming	73	55	69	60	40	44	51	54	29	60	52	69	44	41	61
Air pollution, water contamination, river/ocean pollution	21	32	31	67	52	44	46	27	45	30	41	27	48	37	32
Water shortage, food problems	42	43	48	33	32	34	41	38	26	50	39	43	35	33	40
Deforestation, desertification, loss of biodiversity	41	35	36	47	53	69	64	50	33	40	46	40	60	40	44
People's lifestyles, waste-related problems	25	22	24	27	29	41	18	15	50	10	27	25	29	33	26
Environmental problems and economics/trade-related activities	16	15	16	7	8	16	15	23	43	0	17	16	12	31	17
Population, poverty, status of women	16	51	33	0	37	25	36	35	29	50	34	23	34	33	26
Others	6	11	10	10	2	0	3	12	7	0	7	8	2	8	6
No response	2	3	2	0	5	3	0	4	0	10	3	2	3	3	2

■ : Answer with the highest number of replies ■ : Answer with the second highest number of replies

Notes: The % refers to the total number of valid responses while excluding any unknowns. The total is to be 100%.

However, in 2000, respondents from all regions except Latin America and Africa indicated that the greatest causes of environmental degradation were “1. Explosive population growth” and “2. Economic development that disregards the environment.” As a result the sense of crisis caused by global warming was low in all regions except in Japan.

Table-3 Causes of Global Environmental Degradation (2000)

		Japan	United States & Canada	Western Europe	Asia	Latin America	Africa	Oceania	Eastern Europe & former Soviet Union	Middle East	Overseas Total
Human Activities	1. Explosive population growth	43	59	49	57	42	34	77	37	55	51
	2. Economic development that disregards the environment	46	47	51	54	54	66	71	68	55	55
	3. Nuclear threats	11	3	5	11	4	4	12	0	18	6
	4. Epidemics	0	7	1	3	0	9	12	11	0	5
	5. Water and food shortages	18	23	18	21	27	26	6	5	9	20
Atmospheric	6. Global warming	41	20	36	28	12	30	18	32	18	27
	7. Abnormal climate	5	10	5	12	12	6	12	11	0	9
	8. Air pollution and acid rain	4	3	1	21	4	6	6	5	9	7
	9. Destruction of the ozone layer	8	3	2	19	4	11	12	16	0	8
Ecological	10. Destruction of forests and desertification	24	13	19	52	50	55	29	32	46	33
	11. Reduction of genetic diversity	9	5	10	16	8	11	6	11	9	10
	12. Pollution of oceans and rivers	9	12	6	19	27	9	29	5	18	13

■ : Answer with the highest number of replies ■ : Answer with the second highest number of replies

I-4 Environmental Conditions of Concern in Selecting the Time—A New Approach

Starting with the 2011 Questionnaire, the traditional categories of environmental conditions of concern that informed the selection of time on the Environmental Doomsday Clock were reorganized, and a new axis was incorporated. The following graph shows the results of the 2011 survey, in which respondents from both developed and developing regions most frequently selected “1. Climate change.” This was followed by “6. Population” among respondents in developed regions, and “4. Pollution/Contamination” in developing regions.

Table 4 Environmental Conditions of Concern in Determining the Environmental Doomsday Clock Time (2011) (%)

	Total	area									Overseas Total	Developed Regions	Developing Regions	Others	Asian Four	Rest of Asia	China	Korea	India
		Japan	United States & Canada	Western Europe	Asia	Latin America	Africa	Oceania	Eastern Europe & former Soviet Union	Middle East									
1. Climate Change	23	23	25	21	25	23	30	23	14	30	24	24	23	18	29	22	20	29	17
2. Biodiversity	10	8	13	15	9	14	14	14	14	0	11	10	10	13	9	9	8	10	15
3. Land Use	7	6	6	9	7	13	11	14	15	0	8	6	10	13	4	9	8	2	12
4. Pollution Contamination	12	11	8	9	19	5	2	5	13	20	13	11	18	10	14	23	27	12	15
5. Water Resources	9	7	12	11	10	10	14	7	11	10	11	8	13	10	5	13	13	2	10
6. Population	12	15	15	14	6	10	5	16	4	10	10	14	7	9	6	6	5	6	10
7. Food	7	9	4	6	5	3	10	2	1	10	5	8	4	2	7	3	3	7	0
8. Lifestyle	7	8	4	5	6	5	2	9	6	0	5	7	5	6	8	5	5	9	12
9. Global Warming Measures	3	3	1	2	6	1	2	2	6	10	4	3	2	5	10	3	2	15	2
10. Environment and Economy	4	4	6	4	4	8	3	9	8	0	5	4	5	8	4	4	5	2	0
11. Environment and Society	3	3	4	4	3	5	5	0	7	10	3	3	3	5	2	3	3	2	7
12. Other	2	3	2	1	1	3	3	0	1	0	1	3	1	1	2	0	0	3	0

■ : Answer with the highest number of replies ■ : Answer with the second highest number of replies

Notes: The % refers to the total number of valid responses while excluding any unknowns. The total is to be 100%.

New Approach

In order to observe the changing global environment with the clearest possible perspective, we have reorganized and rebuilt the “environmental conditions of concern,” using a new basis described following. This new basis, which includes additional societal considerations, was created by referencing the paper “Planetary Boundaries: Exploring the Safe Operating Space for Humanity” by Carl Folke, Johan Rockstrom, Jonathan Foley, James Hansen, and others: 2009 Ecology and Society, 14 (2)32.

Table-5 New Basis for Environmental Conditions of Concern

Item	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 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	<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 cause 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	()

II. Progress Towards Agenda 21

II-1 Progress in 20 Categories of Agenda 21

For 19 years since 1992, the questionnaire has probed respondents about the progress of Agenda 21 in their respective countries, asking them to evaluate the status of the action plans countries and international organizations must implement to realize sustainable development. The following chart shows 1996 results combining “significant progress” and “some progress.” In each region, respondents favorably evaluated the progress in “NGO activities” and “environmental education,” whereas “Poverty and overpopulation” and “Lifestyles and consumption patterns” were seen as having made little progress.

Table-6 Progress toward Agenda 21 (1996)

(%)

	Japan [N=282]	U.S.A. & Canada [51]	Western Europe [77]	Asia [63]	Latin America [35]	Africa [32]	Oceania [21]	Eastern Europe & former Soviet Union [16]	Middle East [11]
1. International cooperative efforts	43	55	40	57	46	63	62	50	46
2. Poverty and overpopulation	14	22	8	43	37	44	19	13	18
3. Lifestyles and consumption patterns	16	29	26	21	20	13	43	19	27
4. Local government and citizens' group activities	52	77	79	65	74	75	86	69	55
5. NGO activities	67	86	82	83	83	88	86	81	73
6. Industrial sector policies	53	57	55	48	43	47	71	44	64
7. Global warming	19	31	26	32	23	47	38	25	18
8. Ozone layer protection	52	65	69	41	34	53	43	38	36
9. Acid rain reduction	22	51	46	18	26	13	19	38	27
10. Forest conservation	14	35	38	56	51	81	86	44	36
11. Desertification	4	12	8	33	23	88	33	0	46
12. Agricultural and rural development	8	37	21	57	43	69	62	25	55
13. Biodiversity	16	49	42	46	51	75	67	56	64
14. Protection of oceans	13	43	26	30	40	44	48	31	55
15. Protection of fresh water	12	43	34	33	37	66	52	63	73
16. Hazardous waste disposal	38	45	49	38	31	34	48	50	36
17. Recycling systems	48	94	70	37	23	34	57	31	46
18. Scientific and technological advancement	50	71	61	52	46	50	71	50	82
19. Environmental education	49	88	66	71	77	88	91	94	91
20. Environment assessment system	21	43	39	48	37	63	62	75	64
21. Integration of economic and environmental policies	11	14	22	25	29	38	33	44	9

■ : Answer with the highest number of replies ■ : Answer with the second highest number of replies

II-2 Progress in 10 Categories of Agenda 21

After 2001, the questionnaire probed respondents about the progress made in their countries in the 10 categories of Agenda 21 considered particularly important. The following graph shows the results from 2006. Respondents who reported progress (combined total of “significant progress” and “some progress”) surpassed 50% in the categories of “promotion of environmental education,” “activities by local governments and citizens’ groups,” “environmental measures by industry,” “scientific and technological contributions,” and “formation of recycling systems.” On the other hand, respondents reporting no progress (combined total of “almost no progress” and “no progress”) exceeded those who stated progress had been made in the five categories of “conservation of forest resources,” “greenhouse gas prevention measures,” “conservation of biodiversity,” “population and poverty problems,” and “lifestyle alteration.”

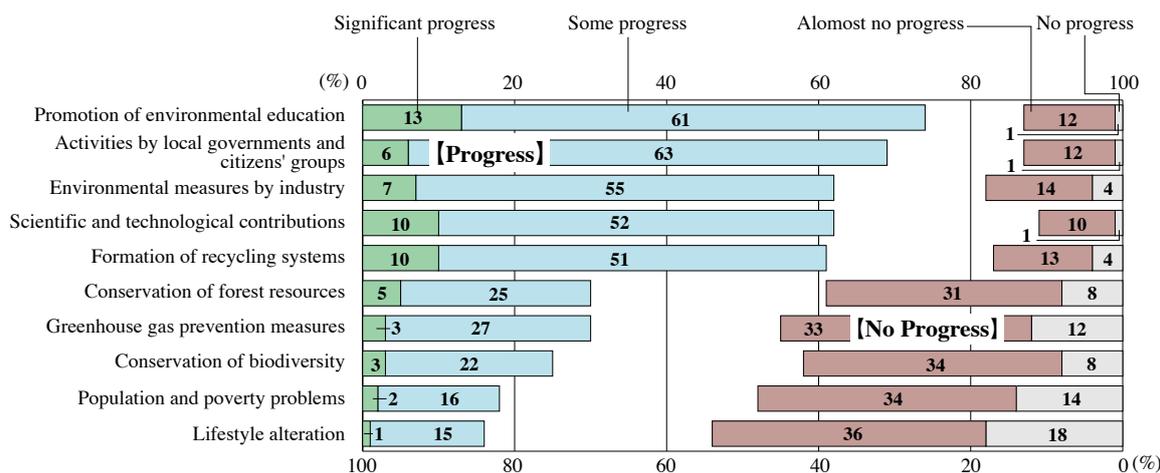


Figure 4 Progress toward Agenda 21(2006)

The graph below shows the results on the progress made in the respondents’ countries in the 10 categories of Agenda 21 over 18 years from 1993 to 2010. The top five categories, in which more than 50% of respondents indicated progress, have always remained in the top five, whereas the bottom five have also consistently remained in the bottom five. Further, the discrepancy between the top five categories where progress has been seen and the bottom five categories where progress is lacking has continued to grow since the late 1990s.

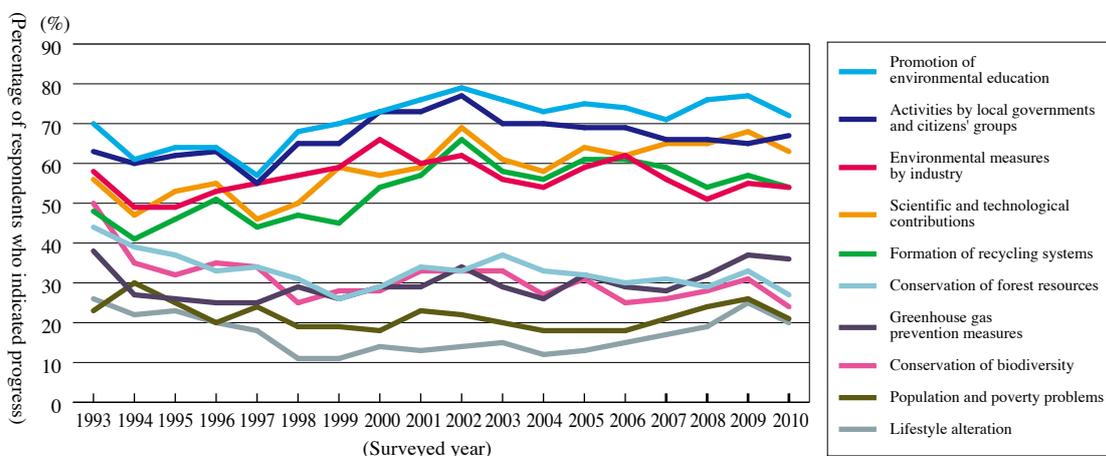


Figure 5 Progress toward Agenda 21(1993-2010)

Facts about the “Questionnaire on Environmental Problems and the Survival of Humankind”

The questionnaire is distributed to environmental experts around the world, including members of government organizations, NGOs, academic and research institutions, corporations, and mass media. It is published in Japanese, English, Chinese, Korean, and Spanish, and is sent to approximately 7,000 respondents each April. Responses are gathered by June, and results are published in September. (Supervision is provided by Professor Akio Morishima, Special Research Advisor of the Institute for Global Environmental Strategies and board member of the Foundation.)

Table-7 Shift in the Number of Respondents Over 20 Years (1992-2011)

	1st 1992	2nd 1993	3rd 1994	4th 1995	5th 1996	6th 1997	7th 1998	8th 1999	9th 2000	10th 2001
Japan	877	61	189	248	282	306	279	293	311	292
United States & Canada	49	22	23	25	51	38	62	59	93	58
Western Europe	39	38	62	79	77	65	60	79	88	84
Asia (except Japan)	30	43	92	62	63	63	54	60	81	83
Latin America	11	37	36	48	35	41	33	27	26	35
Africa	9*	40	53	62	32	52	51	39	53	55
Oceania	9	22	22	22	21	18	21	13	17	30
Eastern Europe & former Soviet Union	13	13	17	14	16	15	18	14	19	22
Middle East	9*	6	4	16	11	14	15	12	11	22
Region of respondents unknown	17	0	6	0	1	1	2	1	3	3
Overseas Total	168	221	315	328	307	307	316	304	391	392
Total	1054	282	504	576	589	613	595	597	702	684
Response Rate	28.3%	11.0%	20.8%	21.7%	18.4%	19.1%	17.9%	18.5%	20.5%	17.3%

	11th 2002	12th 2003	13th 2004	14th 2005	15th 2006	16th 2007	17th 2008	18th 2009	19th 2010	20th 2011
Japan	303	315	324	312	307	322	314	324	292	468
United States & Canada	55	76	68	65	49	47	32	42	28	129
Western Europe	79	98	90	91	70	70	67	60	55	80
Asia (except Japan)	68	88	139	92	90	140	187	192	212	223
Latin America	27	37	40	32	23	36	50	46	27	26
Africa	41	55	44	39	37	35	24	28	20	24
Oceania	24	39	32	26	22	18	14	23	13	17
Eastern Europe & former Soviet Union	29	66	57	42	36	30	28	35	21	27
Middle East	12	30	9	10	21	17	15	7	6	5
Region of respondents unknown	1	2	0	0	0	0	1	0	1	1
Overseas Total	336	491	479	397	348	393	418	433	383	532
Total	639	806	803	709	655	715	732	757	675	1000
Response Rate	16.0%	18.0%	22.2%	19.5%	16.4%	18.3%	16.8%	17.8%	15.7%	14%

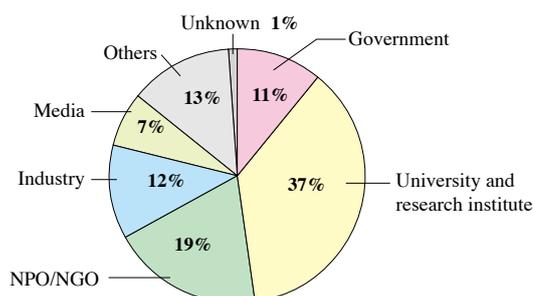
* Figure includes the total for Africa and Middle East

The following chart and graph show the breakdown of number of countries surveyed and affiliation of respondents in 2011.

Table-8 Number of Countries Surveyed

	Number of countries surveyed
Asia	23
Africa	47
Oceania	9
Western Europe	20
Eastern Europe & former Soviet Union	23
Middle East	14
United States & Canada	2
Latin America	31
Total	169

Figure-6 Affiliation of Respondents



af **THE ASAHI GLASS FOUNDATION**

2nd Floor, Science Plaza, 5-3, Yonbancho
Chiyoda-ku, Tokyo 102-0081, Japan

Tel.: +81 3 5275 0620 Fax: +81 3 5275 0871

E-Mail: post@af-info.or.jp

URL: <http://www.af-info.or.jp>