

inhabitants settle in this city, without a serious hope for a better life. The environmental contamination in Mexico City is so great that it is equal to 40 cigarettes smoked every day by each inhabitant (Hunter, 2000).

Similar living conditions exist in Sao Paulo (20 million), Calcutta (13), Buenos Aires (12), Shanghai (11), and Manila (10). Even in developed countries, such cities as Tokyo (17), New York (15), Los Angeles (10), and London (10) have characteristically high rates of crime and alienation of citizens, which worsen quality of life. Consequently, one can state that high urbanization is a threat for human-friendly civilization (Hunter, 2000).

### Technology and Computer Threat

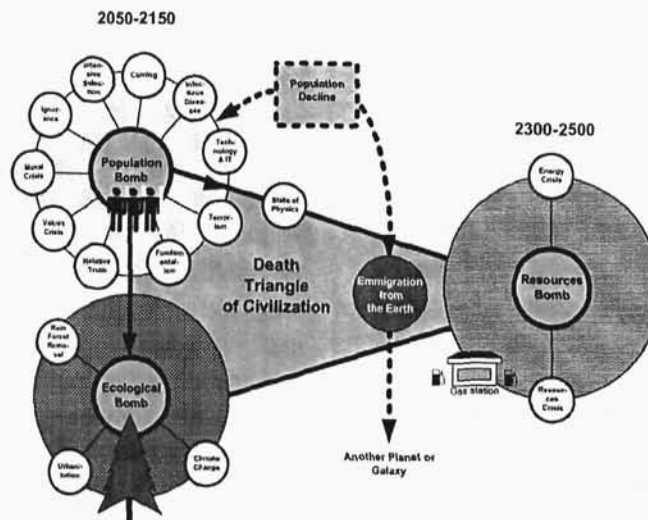
The rapid growth of mechanization dates from James Watt's invention of the steam engine in 1769. In the 19<sup>th</sup> century mechanization cut back muscle work and so led to more time spent on education and engineering. Thus, it led to automation, informatization, and robotization of industrial and

mental processes in the 20<sup>th</sup> century. In the 21<sup>st</sup> century, informatization and robotization are the main factors of productivity growth at the annual rate of 5%. But it triggers the growth of the economy without the growth of new jobs (jobless economy). If this trend reaches the whole world, it may provoke global unemployment in times when population growth already surpasses the number of available jobs. This strong but chaotic productivity development may not be good for civilization (Targowski, 2003b).

### THE "DEATH TRIANGLE" OF CIVILIZATION I

This interaction of threats illustrates a model<sup>20</sup> of "The Death Triangle of Civilization I," shown in Figure 17-2 (Targowski, 1999). This event is driven by the population bomb (bomb P), ecological bomb (bomb E), and resources bomb (bomb R). The most dangerous is the bomb P, which initiates the others. The bomb P's activities are strengthened by ten biological and cultural threats.

Figure 17-2. The death triangle of civilization



Although the danger of each threat is not by itself critical for civilization, a combination of all ten threats and the bomb P may put civilization in a deep crisis.

The year 2050 is the assumed beginning of bomb P activities, since about that time world population will reach 9 billion. This number falls into the lower limit of the ecosystem's capacity, which is about 9 to 12 billion people<sup>21</sup>. Even 36.4 billion people in 2300, assuming smaller reproduction per family, will exceed three times the capacity of the ecosystem.

Such a big population on the Earth will trigger the blast of the bomb E, which even nowadays is perceived in the less-developed countries. Its impact is strengthened by the removal of the rain forest, climate change, aggressive urbanization, land desertification, and other human actions against environment quality.

More productive industry will produce more goods for the growing population, causing

depletion of strategic resources in 2300-2500. It is worth noticing that the high quality of life in developed countries now is possible because 80% of global population does not participate in such a resource-rich way of life. For this reason, 20% of global population may enjoy easy access to natural resources. Of course, man is capable of substituting some man-made resources for natural ones. However, humans will not be able in any foreseeable future to provide artificial substitutes for all natural resources.

The presented model indicates that civilization I can be saved if population declines or if part of society is transported off the Earth. The first solution is feasible if the United Nations and church agree on the solution to population control, and people follow their recommendations. The second solution requires huge funds and new discoveries, which would allow for travel faster than the speed of light. If the first solution is possible, the second one is less probable at this time.

*Table 17-1. The cosmic threats to civilization*

CIVILIZATION THREATS	SYMPTOMS	STATE OF THREAT	SOLUTION	RESPONSIBLE	PROBABILITY OF SOLUTION SUCCESS	IMPLEMENTATION TIME IN YEARS
End of the Solar System	Sun extinction	Ultimate	People out of the Solar System	Science must discover how to travel faster than light	Very low, more metaphysical than real	2 billion
End of Milky Way Galaxy	Collision with other galaxy or supernova	Ultimate	People out of the Solar System	Science must discover how to travel faster than light	Very low, more metaphysical than real	5 billion
Collision with Blue Objects	Anytime	Highest	Resteering of Blue Objects	Science and NASA (USA)	Low	Several decades

Table 17-2. The natural threats to civilization

CIVILIZATION THREATS	SYMPTOMS	STATE OF THREAT	SOLUTION	RESPONSIBLE	PROBABILITY OF SOLUTION SUCCESS	IMPLEMENTATION TIME IN YEARS
Climatic	Greenhouse Effect	Depends on views	More research, fewer gas emissions	Science, governments, UN	Moderate	100
Extreme	Floods Drought, etc.	Moderate	Better planning and monitoring, more investments, relocations	Governments	Moderate	50
Energetic	Shrink-ing reserves	High	Nuclear energy and forms [[OF WHAT? SOLAR ENERGY?]]	Science, technology, governments	Good	20
Resources	Shrink-ing reserves	Highest	Man-made Substitutions	Science, technology, governments	Good	15

### MEANS OF REMOVING CIVILIZATION THREATS<sup>22</sup>

The characteristics of each civilization threat are provided in the following tables, including the degree of each threat and its possible removal. The cosmic threats are characterized in Table 17-1. It looks like the Earth has 2 billion years to support life; after that the solar system will be not useful for humans, and life will disappear. There are other possible cosmic catastrophes against which there is no good protection yet.

The natural threats to civilization are listed in Table 17-2.

The biological threats to civilization are shown in Table 17-3. The most critical threat is the uncontrollable growth of population. This threat triggers others. The cloning of humans

seems to be a very dangerous threat, since it can open a Pandora's box of intra-species conflicts over planetary dominance, with consequences which are very difficult to predict. For example, cloning may initiate the creation of new kind of humans and destruction of *Homo sapiens*. The threat of infectious diseases, particularly from AIDS, can destroy the whole population of Africa, if the lifestyle there does not change. The present anti-AIDS medications are so complex in their applications that it is almost impossible to count on their success. If the lifestyle in developing countries cannot be changed, then population can decrease to 3.9 billion in 2150 and to 2.3 in 2300 (UN, 2003).

The characteristics of cultural threats are shown in Table 17-4. The most critical is a threat of terrorism, which if not contained in time can

Table 17-3. The biological threats to civilization<sup>23</sup>

CIVILIZA-TION THREATS	SYMP-TOMS	STATE OF THREAT	SOLUTION	RESPONSIBLE	PROBABILITY OF SO- LUTION SUCCESS	IMPLE-MENTATION TIME IN YEARS
Population Growth	Overpop- ulated cities and trans-port	Critical	Birth Control	UN, States and Church	Good	5-15
Destruction of biological diversity	Disappear-ance of species	Small	Environ-mental protection	State	Good	5-15
Human cloning	Intra-species conflict	High	Regulated research	UN, States and Church	Good	3-10
Intensive selection	Animal diseases	High	Regulated selection	State	Good	5-15
Infectious diseases	Incurable Diseases	High	More research	State and WHO	Good	5-15
Lead Poisoning	Human Aggres- siveness	Low	Envi- ronmental protection	State	High	5-15

have unpredictable negative consequences. The remaining threats are dangerous for civilization but will mostly only worsen the quality of life. The push toward consumerism and the constant increase of material possessions causes negligence of higher-order values, which leads to truth relativism, which falsifies reality. This approach threatens further progress in science and in wise civilization development based on self-sustainability.

The characteristics of the infrastructural threats to civilization are provided in Table 17-5. The most critical threats are the gradual removal of the rain forest and an overly aggressive application of technology and informatics. These lead to more and more productive work, but eventually the population will grow too big and there will not be enough jobs for new workers.

According to data provided in the above tables, it looks like civilization I is entering into a crisis stage which could lead to its fall in the third millennium. The tables provide means of removing or minimizing those threats, if indicated organizations and individuals take the necessary steps to making this a possibility.

In summary, one can state that the most critical task is the elimination of the population growth threat. However, eventual success in this project also depends on the removal of cultural threats which influence the population issue.

The processes of removing or minimizing cultural and population threats should take place concurrently. Their positive elimination will provide the foundation for positive solutions in respect to the next threats of the bomb E and bomb R.

Table 17-4. The cultural threats to civilization

CIVILIZATION THREATS	SYMP-TOMS	STATE OF THREAT	SOLUTION	RESPONSIBLE	PROBABILITY OF SOLUTION SUCCESS	IMPLE-MENTATION TIME IN YEARS
Ignorance and Super- stition	Scientific illiteracy	Middle	Critical position of scientific as- sociations	Sincere leaders and intellectuals	Middle	Instant
Crisis of moral rela- tions	Cynicism and mani- pulation	Middle	Anti-consume- rism actions	Church and fami- ly associations	Middle	Instant
Truth relati- vism	Fuzzi- ness of truth and responsi- bility	Middle	Critical position of scientific as- sociations	Sincere leaders and intellectuals	Middle	Instant
State of theoretical physics	Science stagna- tion	High	Science	Sincere leaders and intellectuals	Middle	Instant
Value crisis	Loss of sensitiv- ity toward values	Middle	Education	Church and schools	Middle	Instant
Culture comercia- lization	Loss of taste	Low	Education	State	High	Instant
Anti-demo- cracy	Mind cap- tivation	Middle	Open Society	Social and poli- tical leaders	High	Instant
Funda- mentalism	Mind cap- tivation	High	Open Society	Social and poli- tical leaders	Low	Instant
Terrorism	Innocent victims	High	Open Society	International Cooperation	Middle	Instant
Globali-za- tion	Corporate greed	Middle	Global Society and Universal Civilization	International Cooperation	Middle	Instant

The model of hierarchical removal of civilization threats is shown in Figure 17-3.

## THE FUTURE OF CIVILIZATION

Civilization is about 6,000 years old and reached its peak in the 20<sup>th</sup> century. But due to its spectacular development in the last 100 years, this civilization is now under stress and in trouble (Brown, 2003). Civilization takes place on the Earth, which is a relatively small planet, an “island” in the universe. This “island” has limited resources, which are being depleted in an increasingly rapid manner<sup>24</sup>. This is the major problem of the civilization. If humans will not adapt a self-sustainable strategy for their existence, they will face the following crises (Figure 17-4):

1. Short-term crisis – “the Death Triangle of Civilization” in years 2050-2500

2. Mid-term crisis – depletion of potential reserves of resources in years 5000+ and a new Ice Age within 15,000-50,000 years (different estimates).
3. Long-term crisis – the solar expansion within 2 billion years (Figure 17-5).

The mid-term crisis is very obvious, since the Earth has a limited volume of natural resources. Hence civilization can last only 9,000 years or 3,000 years more, only 50% of its actual existence so far (6,000 years). There is not much time left for all of us. The solution can come from the implementation of the universal civilization I, which should transform from the present restricted civilization I (see Preface). A set of world values of that civilization should be based upon such grand values as wisdom, goodness, self-sustainability, and dialogue as well as upon a set of chosen values of global and autonomous civilizations (Kuczynski, 1986; Targowski, 2004b). If humans

Table 17-5. The infrastructural threats to civilization

CIVILIZATION THREATS	SYMPTOMS	STATE OF THREAT	SOLUTION	RESPONSIBLE	PROBABILITY OF SOLUTION SUCCESS	IMPLEMENTATION TIME IN YEARS
Loss of forests	Climate and habitat change	High	Environment Protection	State and international organizations	Middle	Instant
Urbanization	Diseases and crime	Middle	Spatial Policy	State	Middle	Instant
Technology and informatics	Loss of privacy and jobs	High	Privacy Protection and job security	State	High	Instant

Figure 17-3. The model of hierarchical removal of civilization threats

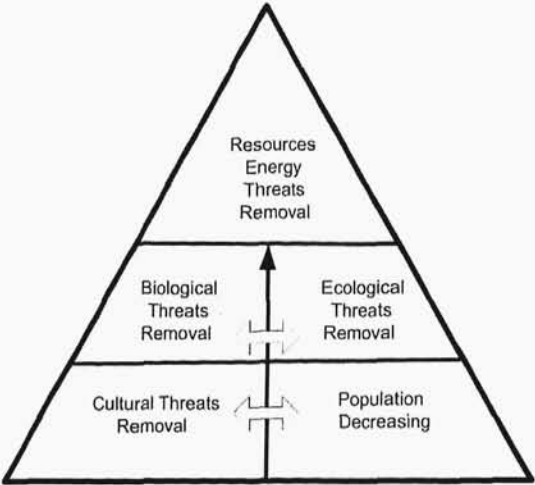


Figure 17-4. The short and mid-term crises of civilization

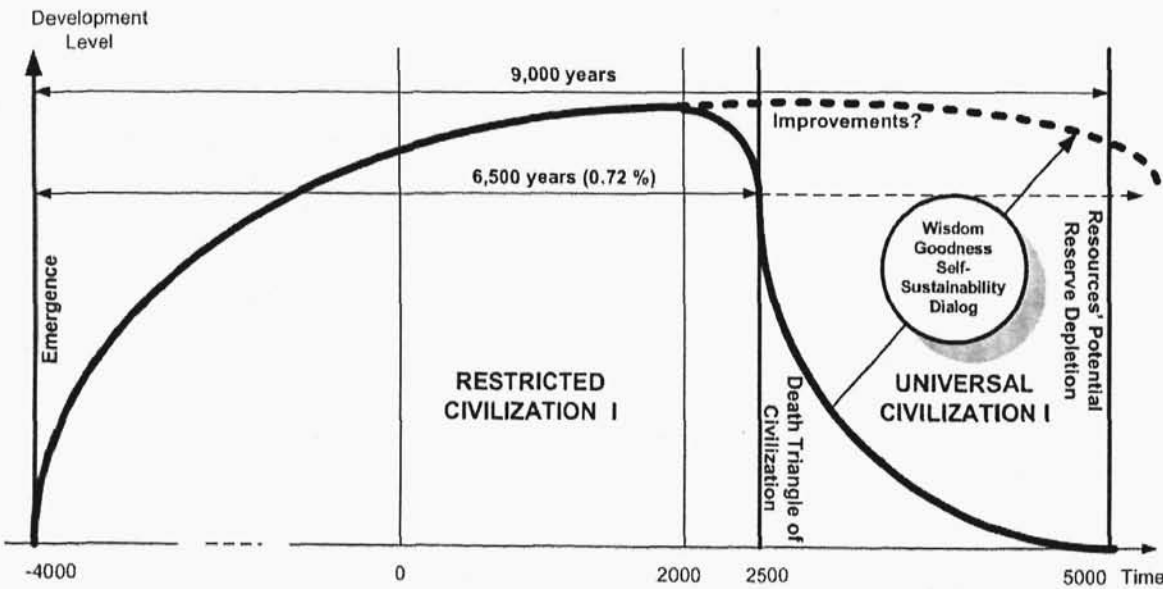
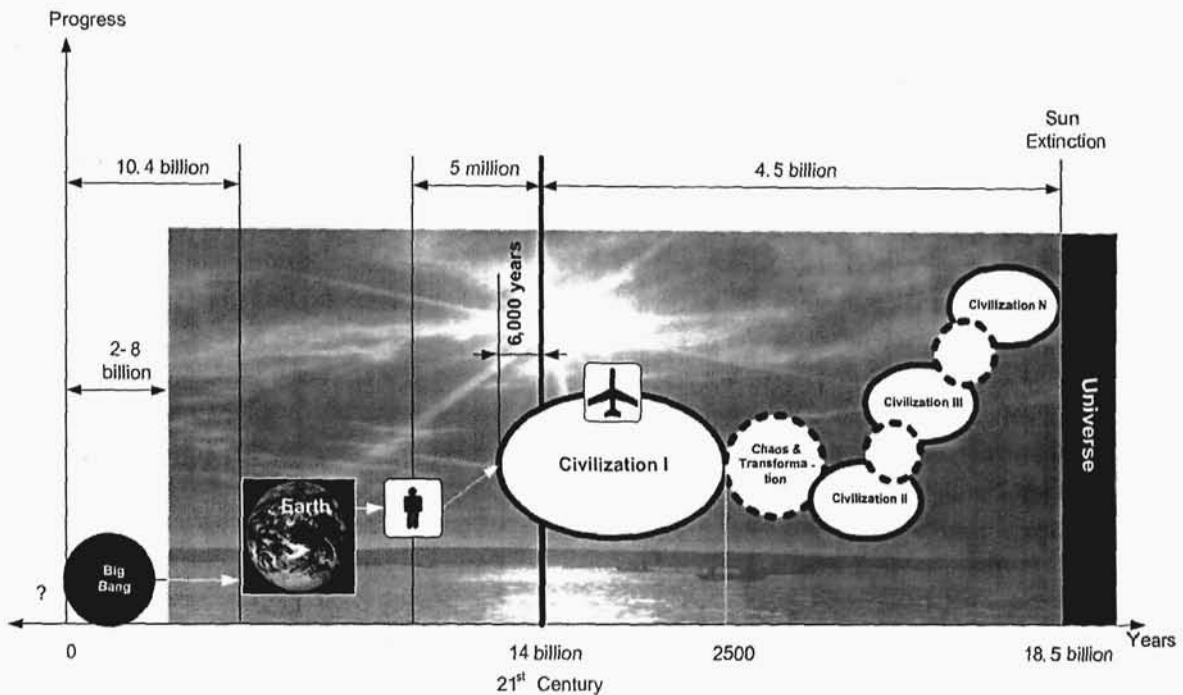




Figure 17-5. The fate of civilization (shown periods are not to scale)



are successful (rising to their greatness) in the implementation of the universal civilization I, they may eliminate the threat of the death triangle and mid-term crisis of civilization I. The game is about saving more years ("buying time") for civilization I. How many years more do we have? A few hundred or a few thousand or more?

The long-term future of civilization depends on its internal processes and the physical permanence of the Earth. The Earth remains a larger-scale "*Titanic*," since it will be a cemetery after 2 billion years.

Some other data indicate that the Earth is getting darker. Between 1960 and 1990, some scientists believe, the amount of solar radiation reaching Earth's surface may have declined or is filtered by air pollution as much as 10%; in some places, Hong Kong, for example, more than 35%<sup>25</sup>. The fate of civilization is illustrated by a model in Figure 17-5. It shows that the end of civilization I does not mean the death of human-

kind; rather, the end may be disorganized, with a return to the Stone Age, beginning civilization again from square one. Hence, one can imagine such a developmental scenario of civilization, that its consecutive phases can be separated by phases of chaos and inter-civilization transformations. (On the other hand, we have already used up all the mineral resources that are easy to get at; future redevelopments would not be able to repeat our industrialization, or even our bronze and iron ages. Well, maybe they could mine the ruined cities.)

Up till now, 181 generations<sup>26</sup> of mankind have been participating in civilization. There is a chance that another (about or less) 60,600,000 generations may live on the Earth, unless it becomes "an empty refrigerator" without sufficient "food" in it within 2 billion years (when life conditions will be worsening).

The finiteness of civilization explains why man is mortal in the universe. If the "invisible



hand” of the universe decided that the Earth is biologically finite, then mankind must be finite too and prepared for the worst.

In such a case, men can ask about the sense of their struggle to become more civilized, if civilization is under eventual sentence of death. The reply to this question needs help from philosophy and religion. Humans need some hope in any form to find *raison d'être* for being.

The distance in time of this final frontier of civilization allows us to forget about it and treat the present time and near future as the time of our existence and chance to be good, wise and universal, involved in civilization improvements. If man is able to practice such qualities, then perhaps he might find a solution for contemporary problems, and his civilization may last long, at least 2 billion years. In other words, from man's point of view, civilization may seem eternal. Perhaps this statement should inspire us with a feeling that we do not lose time. Maybe humans are not alone in the universe. Maybe “the invisible hand” controls us in the universe.

## CONCLUSION

Accurate prognoses rarely prove themselves, since people treat them seriously and try to avoid their doomsday predictions. Let us hope that this will be the case with the predictions for civilization provided in this study.

Presently, the critical task is to contain the growth of population and cultural threats, which influence the bomb P. To achieve this, civilization should transform from the restricted autonomous and global civilizations into universal civilization, based on dialogue and universal values (Kuczynski, 1986; Targowski, 2004b) acceptable by all contemporary religion-oriented (restricted) civilizations, such as Western, Eastern, Chinese, Japanese, Buddhist, Islamic, Hindu, and African.

Leading this transformation can be the promotion of an open society and global society (Soros, 2003) or rather a universal global society, which requires well-educated and well-communicated members. In these processes, one can seek the development of wise humans who will be able to sustain their civilization. Otherwise, our time is limited and we will not survive the knowledge that we have developed.

### A. Further Research Directions

- Investigate the social barriers hierarchy of self-sustainable development of civilization.
- Investigate the economic barriers hierarchy of self-sustainable development of civilization.
- Investigate the ecological barriers hierarchy of self-sustainable development of civilization.

### B. Research Opportunities

- The research opportunity is in “connecting dots” among major barriers of civilization development and motivating decision-makers for wiser decisions about humans' well-being.

### C. Additional Ideas

- The future of civilization is bleak and cannot be corrected by political action, since political action is driven by a very short-term horizon. The solution is in defining a new solution (beyond a political one). How do we manage civilization's existence? Perhaps by forming the civilization council?

### D. Rationale

- Many studies provide a very sad prognosis for the future of our world. The pace of

human progress accelerated profoundly in the 20<sup>th</sup> century, spawning revolutionary advances in medicine, agriculture, and industry. Between 1900 and 2000, the world's population quadrupled, and production and consumption of goods increased by a factor of twelve. These activities have begun to deplete critical resources such as soil nutrients and fresh water, leading to potentially widespread shortages in the world's poorest regions. Fossil fuel emissions have assured a rapid increase in greenhouse gases and contributed to rising surface and ocean temperature, a warning that is almost certain to continue throughout the twenty-first century. The complex interactions between pollution, warming, and resource depletion certainly threaten the planet's biodiversity and endanger innumerable species. If one connects the dots of population growth, ecological devastation, and strategic resources depletion, then arrival of the death triangle of mankind will be perceived very soon, about 2050! Hence humans have not much time to think and act wisely to protect civilization against extinction or very drastic decline. This kind of research and political agenda should be humans' first priority in working on civilization betterment.

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## ENDNOTES

- <sup>1</sup> See Chapter I for a discussion of the proposed nature of civilization.
- <sup>2</sup> There is a theory that about 40,000 years ago humans passed a genetic mutation with the gene DRD4, which influences human intelligence by encoding a neuron-recep-

tor-dopamine (Ding et al., 2000).

- <sup>3</sup> Based on Kazimierz Grotowski (1999).
- <sup>4</sup> Based on Leszek Starkel (1999).
- <sup>5</sup> Based on Jakub Siemek (1999) and Andrzej Z. Hryniewicz (1998).
- <sup>6</sup> Based on Roman Ney (1998) and Roman Pampuch (1998)
- <sup>7</sup> Based on Halina Krzanowska (1998) and Włodzimierz Korohoda (2002).
- <sup>8</sup> Based on Marian Tischner (1998).
- <sup>9</sup> Based on Janusz Jeljaszewicz (1999).
- <sup>10</sup> Based on Stanisław Przestalski (2000).
- <sup>11</sup> Based on January Weiner (1999).
- <sup>12</sup> Based on Piotr Sztompka (1999).
- <sup>13</sup> Based on Jerzy A. Janik (1999) and Jerzy A. Janik (2000).
- <sup>14</sup> Based on Andrzej Staruszkiewicz (2001).
- <sup>15</sup> (1) Planets move in elliptic orbits around the Sun, (2) An imaginary straight line joining a planet to the Sun sweeps out equal areas of the ellipse in space in equal intervals of time, (3) the square of the period of revolution of a planet is in direct proportion to the cube of the semi-major axis of its orbit.
- <sup>16</sup> Newton's Law of Inertia, Law of Constant Acceleration and Law of Conservation of Momentum.
- <sup>17</sup> Based on Władysław Strozewski (2000).
- <sup>18</sup> Based on Witold Ceckiewicz (2001).
- <sup>19</sup> Based on Piotr Heczko and Mirosław Jawien (2002).
- <sup>20</sup> A name of the model is provided in quotes because it reflects indirectly the importance and urgency of the issue.
- <sup>21</sup> People are the integral part of the ecosystem. The ecosystem is a collection of the environment, plants, animals, microorganisms, and dead matter, which co-habitat as a functional system. The ecosystem secures for animals and people food and water, regulates floods, droughts, land degradation, and plagues, and supports soil formation, food recycling, recreation, spiritual instances, religion, and so forth.

- <sup>22</sup> This is the response to Plan A—Business as Usual, accelerating environmental decline, spreading hunger, growing unrest and political conflicts, increasing streams of refugees, growing population, being overwhelmed by problems (Brown, 2003).
- <sup>23</sup> More profound analysis of this topic is provided in millennium ecosystem assessment (2003).
- <sup>24</sup> For example, the awakening of China and India as economic powers in the 21<sup>st</sup> century will deplete natural resources faster than one can predict. China with 20% of the world's

population used to apply only 6% of the world's annual mining of natural resources, whereas it may consume several times more when it produces 50%+ of world goods.

- <sup>25</sup> It appears that increased air pollution over Asia during those 30 years increased cloudiness, which exerted a cooling influence (Nash, 2004).

- <sup>26</sup> One generation has 33 years for present purposes.