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Science, Peace and Sustainability

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The Oaxtepec-Declaration

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Editorial

Science and technology have become instrumental to the present patterns of development, and in many countries have evolved from mere instruments into autonomous driving forces; they are as much a part of the problem as they can be a part of the solution. Therefore engineers and scientists play a key role, both in developing new knowledge that might threaten international security and in providing positive solutions for the future.

Science for peace and sustainability is science with a purpose, not value free but actively endorsing, supporting and promoting humanistic values like responsibility and tolerance, justice and equality.

The conference Science, peace and sustainability supports and continues the ongoing discourse of science for sustainability and the special responsibility of scientists and engineers. It was the first INES conference in Latin America and we are grateful to the Universidad Nacional Autonoma de Mexico (UNAM) for taking up the INES initiative and for the support which made the conference a successful event.

Gabriele Krauskopf, INES Executive Secretary

Science, Peace and Sustainability
By David Krieger

The relationship between science, peace and sustainability affects the lives of all of the planet’s inhabitants as well as the lives of future generations yet unborn. The International Network of Engineers and Scientists for Global Responsibility (INES) takes seriously issues of global responsibility, and we believe that engineers and scientists, because of their training, knowledge and privileged place in society, have a special role to play in improving the human condition and assuring a better future for humanity.

INES has worked since 1991 in three principal areas: Peace and Disarmament, Sustainability, and Ethics in Science. INES is an international network of some 70 organizations in 34 countries. It also has individual members throughout the world. INES has held major conferences in Berlin, Amsterdam and Stockholm; and smaller meetings in many places in the world, including Buenos Aires, Argentina and most recently Nagpur, India. We are very pleased to be having our first meeting in Mexico. It is our hope that from this meeting will emerge many important and innovative ideas that will help strengthen the ties between science, peace and sustainability.

Many years ago, in the early 1980s, I had the pleasure of working on a Reshaping the International Order (RIO) Foundation project on Disarmament, Development and the Environment with the great Mexican diplomat and Nobel Peace Laureate Alfonso Garcia Robles. He skillfully negotiated the world’s first Nuclear Weapon-Free Zone in an inhabited region, that of Latin America and the Caribbean. In 2007, that treaty celebrated the 40th year of its existence. It has been one of the significant success stories in the area of preventing nuclear proliferation.

Many other regions of the world have followed in the footsteps of Latin America and the Caribbean, and we have Nuclear Weapon-Free Zones now in the South Pacific, Southeast Asia, Africa, Antarctica and Central Asia. Virtually the entire Southern hemisphere has become a series of Nuclear Weapon-Free Zones. Now countries in the North need to learn from the South, and cease their hypocritical and dangerous posturing and brandishing of nuclear arms.

Around the same time that the treaty of Tlatelolco, establishing the Latin American and Caribbean Nuclear Weapon-Free Zone, was being agreed to, another treaty was being negotiated to prevent the proliferation of nuclear weapons. That treaty, known as the Non-Proliferation Treaty (NPT), was signed in 1968 and entered into force in 1970. It contains a major trade-off. In exchange for the non-nuclear weapons states agreeing not to acquire nuclear weapons, the nuclear weapons states agreed in Article VI to “good faith” negotiations for nuclear disarmament. The International Court of Justice advised in 1996 that this meant bringing to a conclusion “negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.”

What I wish to emphasize is the abysmal lack of “good faith” on the part of the nuclear weapons states and, in particular, the United States. In UN General Assembly voting on nuclear disarmament matters in 2007, the United States had the distinction of voting against every one of the 15 measures put before the UN. France voted against 10 measures, the UK against 9 and Israel against 8.
In 1982, I helped found an organization, the Nuclear Age Peace Foundation, which believes that peace is an imperative of the Nuclear Age. This belief was earlier pronounced by Albert Einstein, Bertrand Russell and nine other leading scientists in the Russell-Einstein Manifesto issued on July 9, 1955. The Manifesto concluded, “There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal as human beings to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death.”

This is the power that scientists and engineers have placed in the hands of humanity: the power to create a new Paradise on Earth, and the power to foreclose the future by means of technologies capable of causing “universal death.” What shall we do? Which path shall we take? Which power shall we exercise? Science has contributed abundantly to war and continues to do so. Can science and scientists play a role in tipping the balance toward peace?

And what about sustainability? Shall we go on using the world’s resources because rich countries consider them to be inexpensive? Nothing irreplaceable can be considered inexpensive. This is another way of foreclosing the future. As an alternative course, scientists can contribute to protecting the world’s resources and developing sustainable forms of energy that do not place heavy burdens on future generations. To succeed in sustainable development, we will also need sustainable disarmament. They are inextricably linked.

Resource depletion is a cause of war. So is greed. So is crushing poverty. If we want peace, we must protect our environment, conserve our resources, and have global standards of human dignity. We must also control and eliminate the weaponry we have created that could destroy human life on the planet, as well as most other forms of life.

If we want peace, we must reverse the Roman dictum and prepare for peace. That means that we must use sustainable technologies and conserve our resources. It also means that scientists must work for constructive rather than destructive ends. They must also set appropriate professional standards that delegitimize destructive uses of science and technology. And they must speak out against such destructive uses and those scientists and engineers who choose to participate in such projects. We need a Hippocratic Oath for Scientists and Engineers based upon the commitment to “do no harm.”

Time is not on our side, but perhaps in our deliberations we can make progress on deflecting the course of history that has divided humanity in the past, been conducive to wars, generated human rights abuses, tolerated environmental degradation, and set humanity on a collision course with catastrophe. Let us use our human capacities to choose hope and set a new course for the future, one rooted in peace, sustainability and the constructive uses of science and technology.

I will conclude with a poem that is part of my first poetry book, Today Is Not a Good Day for War. The poem is about the hibakusha, the survivors of Hiroshima and Nagasaki, those who are the victims, but also the ambassadors, of the Nuclear Age.

Of course this is not just about hibakusha. It is about us as well. It is about our responsibility and also our silence. In today’s world, we all are at risk of becoming hibakusha. We must choose peace, sustainability and human decency, while outspokenly refusing to allow the gifts of our human talents and skills to be used to improve warfare and its capacity for slaughter.

We must break the silence and be leaders for peace and sustainability. We must each play our part in reversing the militarization of our planet and moving it toward a peaceful and sustainable future, the Paradise that Russell and Einstein believed was within our grasp.

Dr. David Krieger is Chair of the INES Executive Committee, President of the Nuclear Age Peace Foundation (www.waging-peace.org), and a councilor of the World Future Council (www.worldfuturecouncil.org)
Science for Peace and Sustainability – Please sign the Oaxtepec Declaration

“In the course of some thousands of years the human species has established a great civilization. It has produced a multifarious culture which accumulated enormous treasures in art and literature. And it has created supreme edifices of science. Therefore, it is of supreme irony that these very developments, intellectual developments of the human species have led to the creation of the tools of its self-destruction. There are many ways in which life on this planet can be extinguished. Of course there is the slow lingering death by poisoning the environment ... But there is also a way of extinguishing life in one act. That is made possible by the advent of nuclear weapons.”


At the beginning of the 21st century, our planet is in severe danger. Many problems are threatening humanity and the biosphere we live in, including environmental destruction, climate change and biodiversity loss, poverty and hunger, population growth and refugees, drugs and crime, the spread of armaments and violence, and the threat of nuclear war. A mutually enforcing triangle of economic growth, concentration of political power and destructive military force and conflict is driving the world toward global disaster.

Billions of people have no access to clean water, sanitation, sufficient food or electricity. Climate change caused by greenhouse gas emissions from energy and other sources will further diminish the supply of water and food, threaten many world regions with disasters and force millions of people to migrate. Environmental degradation will lead to new security risks and aggravate conflicts in many regions. Most vulnerable will be poor people and developing countries, although the rich and developed regions of the world have a much higher responsibility for these problems and also have better capacities to adapt and protect themselves, further aggravating the inequalities in the world.

Despite the end of the Cold War, still more than 1,200 billion US dollars ($1.2 trillion) per year are spent for military budgets, 70% by the NATO countries and 50% by the United States alone. This does nothing to solve the key problems of our times, but rather makes them worse. The continued existence of nuclear weapons poses a direct threat to peace and sustainable development. Nothing symbolizes the principles of unlimited growth, power and force more than the chain reaction of a nuclear explosion which inflicts maximum possible damage upon life. Nuclear weapons represent a world order based on old thinking, destructive means, hostility and exploitation of resources. Getting rid of the huge nuclear arsenals should be the first priority of sustainability strategies, and would create new opportunities for a more cooperative and peaceful world society that addresses the key challenges of our times.

The solution to the complex web of problems and challenges we are facing requires enormous efforts by the world community. To leave the road toward global disaster, the world needs to enter a new path toward sustainable development that can be extended to the whole planet, a path that is compatible and in harmony with the social and natural environment. Sustainable development tries to achieve a balance between human beings, their societies and nature that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability calls for a significant reduction in use and a fair distribution of natural resources between individuals, societies and generations so that a maximum of well being and dignity is achieved for all. It calls also for the creation of safe and peaceful living conditions and for respect of human, cultural and biological diversity.

While sustainable development is an essential condition for peace, the preservation of peace is an essential condition for the cooperative implementation of sustainable development. A violent and non-peaceful world threatens sustainable development and the cooperation it requires, proliferating more causes for environmental conflict and violence. To succeed, the world has to break the vicious cycle between environmental destruction, under-development and war, and strengthen the linkage between peace and sustainable development in a mutually stimulating way.

In order to achieve a transition towards a more peaceful and sustainable world, a bundle of measures can be suggested:

- Eliminate all weapons of mass destruction, above all nuclear weapons; restrain military forces and arms exports; abandon war as an established form of conflict; develop peaceful mechanisms of conflict resolution.
- Prevent global warming and protect against its harmful impacts; work for deep cuts of carbon emissions and help to enlarge renewable energy.
- Protect the integrity of the biosphere; practice sustainable agriculture and forestry; preserve marine resources and biodiversity; establish networks of nature protection.
- Use resources efficiently; foster social innovation in production, distribution and use of goods; develop new sustainable technologies and design.
- Strengthen self-reliance; enhance endogenous production capacity in the non-industrialised countries; add value to the resources and create jobs in the countries and communities of origin.
- Build participatory democracy; create institutions that ensure fair access to education, jobs, civil and political life, health care, food and other resources, without discrimination based on gender, race or income level.
- Encourage people to bring their creativity into the political planning and decision process; contribute new ideas and life styles to global sustainability.
- Establish fair distribution of resources, trade patterns and regulatory mechanisms.

Science and technology are playing an ambivalent role in this context. They are part of the problem and are a necessary part of the solution. They help to accelerate and globalize the complex nexus of world problems through innovations that multiply impacts and risks on the environment and society. But they can also contribute to solving the problems through better understanding and developing more sustainable technology. A transition to a sustainable science requires breakthroughs within the science system and its place into society. Science and education are essential in this process as they can strengthen and channel the enormous innovative capacities of human beings and society toward problem solution. To achieve this, science needs to become more interdisciplinary, integrated and international; become more solution-oriented through peace and environmental research and education at the universities; and scientific institutions need to become more democratic.

We see ourselves in the tradition of Josef Rotblat, a scientist who has dedicated his life to peace and sustainability and who called vehemently throughout his life for the abolition of nuclear weapons and a ban on
war. His legacy remains alive as an example to create a culture of sustainability and non-violence and to establish and strengthen the structures for peaceful resolution of conflicts.

We, the undersigned engineers and scientists, commit ourselves, as professionals and citizens, to pursuing and supporting innovative and interdisciplinary approaches to creating peaceful and sustainable societies.

We pledge to work locally, nationally and globally for the constructive uses of science and technology for a peaceful and sustainable future, free of nuclear and other weapons of mass destruction.

Initiating group:
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Please sign the declaration online at www.inesglobal.com/_Appeals/declaration.html and see the complete subscribers list.

Scientific and Technological Education in Mexico
By Elena Alvarez-Buylla
(Unión de Científicos Comprometidos con la Sociedad)

The Union of Socially Concerned Scientists from Mexico (“Unión de Científicos Comprometidos con la Sociedad”–UCCS) was founded on November 2006 and over 400 members subscribed its “Manifiesto” (www.unionccs.net).

We are convinced that science generates valuable knowledge for understanding and intervening in nature and society. Significant benefits for society and for the environment have and may continue to emerge from the applications of scientific knowledge. Urgent progress is needed in scientific and technological education in Mexico, and advances in science and technological development must be integrated in all economic sectors, encouraging all social groups to take ownership of results from science and technology, so that they can actively participate in understanding and transforming reality in a beneficial way, through sufficient knowledge of the potential of scientific discoveries, as well as the risks and limitations involved in their applications. Hence, the social development of scientific and technological knowledge should be encouraged, and traditional knowledge, often the result of ancient practices, should be appropriately valued and incorporated. This will assist in gradually minimizing our country’s technological dependence and counterbalancing the present day situation that is characterized by:

1) an unprecedented environmental and social crisis
2) socioeconomic inequality that continues to increase
3) an ever-growing technological gap among countries and social groups
4) increasing use of power through violence
5) inability to resolve social conflicts rationally and peacefully
6) increased use of scientific and technological knowledge for military purposes, and for satisfying the economic interests of large multinational corporations
7) a growing tendency to privatize public institutions for research and higher education.

The risks created by the abuses of scientific-technological systems must be constantly monitored, through assessment procedures that include making decisions when serious problems are involved. Experts from different specialized areas should participate in this monitoring process, as should legitimate representatives from social groups that may be affected. Frequently, it is absolutely vital that the precautionary principle be applied, specifically when there are reasonable doubts concerning the social or environmental impacts of a particular technological application, or when there are reasons to believe that irreversible damage might result. The use of risky technologies should thus be discontinued and/or banned, even when the available evidence on potential damage at a particular time does not meet the standards typically required in scientific research for determining that a hypothesis has been verified. It is unfortunate that such an ethical principle is often not respected, and political or economic interests lead to the premature use of technologies when their effects have not yet been evaluated in satisfactory ways.
At UCCS we aim at issuing well-substantiated opinions supported by our expertise in specific scientific areas but also based on inter-disciplinary debates on the relationship between science and society, especially the role played by centers of power in the generation and use of knowledge. UCCS is also integrating critical reviews on three main themes:

1) Climate change
2) Non-sustainable urban development and its consequences for health and environment
3) Agriculture and food production

In response to these problems, we express our conviction that scientific activity should be carried out in an ethically responsible manner and with a clear commitment to society and to the environment, principles of sustainability, fairness, democracy and justice should guide priorities. Our conclusions will be made public and put to the consideration of the government instances in charge of different decisions.

We are sure that UCCS efforts within INES will find synergetic ways to meet its aims, and particularly towards our mutual most pressing aim: making a difference.

¿Qué es la UCCS?

La Unión de Científicos Comprometidos la Sociedad (UCCS) es una organización de científicos dispuestos a asumir tales responsabilidades. Su objetivo es auspiciar la discusión libre y abierta sobre el papel de la ciencia en México, sus políticas, proyectos y líneas de investigación. Asimismo, la UCCS asume el compromiso de coadyuvar a las consecuencias de la ciencia y la tecnología en beneficio de la sociedad y a colaborar en la vigilancia control de los riesgos que ellas mismas generan, poniendo a disposición de la sociedad las habilidades y conocimientos de sus miembros.

Para ello, la UCCS fomenta y apoya la creación de grupos de estudio, debates, foros, publicaciones, y mantiene una página electrónica que facilita la comunicación y el intercambio de opiniones, documentos y diagnósticos a lo largo y ancho del país. La UCCS también hace pronunciamientos públicos acerca de asuntos de carácter polémico, y participa junto a grupos y organizaciones sociales en la discusión amplia y objetiva de temas cruciales que involucran a la ciencia y a la tecnología. La UCCS es una iniciativa surgida de un amplio grupo de científicos de campos diversos como las ciencias naturales, sociales y las humanidades. Los miembros de la Unión cuentan con un extenso reconocimiento nacional e internacional por sus logros académicos y sus puntos de vista críticos, constructivos e independientes.

La UCCS es una organización no lucrativa, un foro abierto, plural y confiable para el análisis científico-técnico riguroso de las formas en que se construye, se distribuye y se usa hoy día el conocimiento, así como sobre las implicaciones socioculturales, ambientales y políticas del mismo.

Science and Scientists Meet at Key Issues

By Alberto Salazar

The INES workshop on “Science, Peace and Sustainability” in Oaxtepec has brought the agendas of science and the scientists to meet at the key issues:

I.) Year after year it is becoming clear that the present development of the world is not sustainable; that social and economic life can have large and lasting effects over the entire planet; that the most basic social and economic needs cannot be met for all by means of developing further along this path; that violence and degradation arises, from the crisis created by expanding development in this way.

II.) The need and urgency for peace and sustainable methods of development may not be as clearly seen in the most wealthy economies as it is seen from developing countries. In Latin America, “colonization” has not finished yet; the urban-industrial-mercantile expansion is currently taking over. This means we are facing an everyday process of progressive degradation of the environment and of public services, irreversible transformations of the land in entire territories, which involves loss of biological diversity, and a growing asymmetry within our society. If we want to stay away from more social conflicts and stop losing our cultural and ecological resources, we definitely need other economical strategies. On the other hand, Latin America is a region where the potential of implementing sustainability is high. Although not all the social and economical problems have technological solutions, many times results from science give the most central indications, and technologies provide the best aid to implementing solutions.

III.) Contrary to developed countries, science and technology have not been among the national priorities so far; even so, strong and specialized groups are active in several disciplines. Now, the scientists who were present at the INES workshop in Oaxtepec are indeed directing their research agendas to specific sustainability problems, and have developed a critical approach to their knowledge needs and advantages. This is why such an INES workshop was important, and the process initiated of exchanging visions and reflections must continue. These are my impressions and hopes from Oaxtepec.

Due to our historical context and the current global crisis in energy and the environment, the quest for sustainable development opens the possibility for our scientists to develop more research that responds to our own demands, connected to the social, ethical, economic and ecological dimensions. We may then apply our new findings to contribute to a myriad of problems, from local to global scales.

Thanks, Alberto Salazar

Alberto Salazar is member of the INES Council and organiser of the conference in Mexico City and Oaxtepec.
Nowadays we are facing a global crisis in at least three fields related to science: environment, energy and climate. All of them have essentially socioeconomic causes and implications.

It is not necessary to describe issues and problems that have been widely and thoroughly studied in all their aspects by scientists: habitat degradation, losses of biodiversity and ecosystems, soil, air and water pollution; sources and uses of energy, physical limits of the planet regarding energy demand; climate change threatening our lifestyles and activities…etc.

Never before have wellbeing and development been as dependent on science and technology as they are today. Their possession constitutes an important source of power. The social role of scientists, therefore, must be re-evaluated regarding the ways in which knowledge generation is conducted and its applications, within the current complex context.

This is not the first time that science and scientists must confront their social responsibility (see for example the Russell-Einstein Manifesto), but in this century humanity is facing new types of uncertainties and scenarios, and a very different political and socioeconomic global arrangement.

We must recognize that in spite of the undisputable place of science in society and its role in the environmental, climatic and energetic problematic, the main current limiting factor to remove is not scientific nor technical, but economical, political and social. Nevertheless, or maybe because of that, the scientists concerned with the short- and long-term consequences of these global crises must do more in order to give a wake-up call to society.

What could be the real impact of the collectives of scientists that are encouraging the application of science aiming to produce social benefits, sustainability, equity, democracy and justice? How much responsibility or involvement can we expect from the majority of scientists in a globalized world where most of science is sponsored by private interests not necessarily concerned with the development of a fairer world?

Some actions that we can do are to continue, to improve, to spread the joint effort and communication all around the world, among the scientists and within universities and other educational and research centers.

As we discussed in the Oaxtepec meeting, it is crucial to proceed with a long-term holistic approach to provide an integrative perspective of society and its relationship with science and nature, but it is also imperative to be capable of producing immediate national and international joint actions. The meeting between UCCS and INES was a small but important step toward these goals.

Construction of national and international collectives working in the spirit of integrative forms of research with the aim of producing potential solutions to social problems is necessary and urgent, as well as the training of new scientists with a responsible, interdisciplinary and critical perspective.

To achieve this, we need to encourage the interdisciplinary analysis of recent scientific developments, their applications and risks, among the scientists and within universities and other educational and research centers. It is necessary to unlock science to complex thought, building a new model for creating knowledge in a collective, well-founded and critical way; integrating traditional learning to create a tighter relation between science and society.

In this reflection social organizations and the different private and public sectors must be involved. It is necessary to share with them the different approaches that could exist for each scientific alternative, showing that science is not an isolated activity with unique answers for each problem. Solving environmental, energetic and climatic change issues is essentially a matter of social, political and economical decisions where science must be a helping tool to produce social benefits and environmental sustainability.
Risks associated with climate change
In its 2007 Fourth Assessment Report the Intergovernmental Panel on Climate Change (IPCC) addresses serious risks associated with climate change that could undermine the living conditions of people all over the world:

- Storm and flood disasters would affect large populations, for instance in Southern Asia where already hundreds of thousands of people suffer from extreme weather events.
- The melting of glaciers jeopardizes water supply in the Andean and Himalayan regions.
- Droughts in Africa force people to struggle for water and fertile land.
- The degradation of ecosystems, loss of biodiversity and the spread of diseases would destabilize natural and social systems.
- The potential loss of the Amazon rainforest, a shift in the Asian monsoon or the shutdown of the North Atlantic circulation would have dramatic consequences on continental scales.
- Sea-level rise affects populated coastal regions across the whole planet.

Most vulnerable are poor communities in high-risk areas and developing countries with low adaptive capacities. But wealthy countries are not spared. During the 2003 heatwave in Europe more than 30,000 people died, and Hurricane Katrina demonstrated the inability of the world’s most powerful nation to cope with such a natural disaster, whether related to climate change or not. If such events become more likely as projected, they could lead to large-scale migrations and a struggle for food and water, negatively affecting human security and the stability of social systems.

Climate change as a threat multiplier?
Climate-related shocks will likely add stress to the world’s existing conflicts. For instance, in the Middle East water scarcity has traditionally been intertwined with the region’s conflicts. In Northern Africa desertification pushes population to move southward, contributing to the struggle for land between herders and farmers. According to a recent UN study the Darfur region in Sudan is considered a tragic example of a social breakdown associated with ecological collapse. In a climate that triggers a cycle of environmental degradation, economic decline, social unrest and political instability, violence may indeed become more likely. Conflicts may spread to neighboring states, e.g. through refugee and resource flows or arms exports, which can destabilize regions and overstretch governance structures.

In April 2007 the UN Security Council for the first time discussed the security risks of climate change. UN Secretary General Ban Ki-Moon warned that climate change may pose as much of a danger as war. A blue-ribbon panel of retired admirals and generals published in April 2007 by the CNA Corporation and the Military Advisory Board, sees climate change as a “threat multiplier” in already fragile regions of the world, becoming breeding grounds for extremism and terrorism. According to this study, the effects of global warming could lead to large-scale migrations, increased border tensions, the spread of disease and conflicts over food and water, all of which could heighten global tensions and directly involve the US military. The report recommends to integrate climate change into US national security strategy to commit the United States “to a stronger national and international role to help stabilize climate change at levels that will avoid significant disruption to global security and stability.” (CNA 2007)

Various scenarios of climate security impacts were compiled by a panel of the Center for Strategic and International Studies, including former CIA director James Woolsey, Nobel laureate Thomas Schelling and other key figures. According to its November 2007 report, climate change “has the potential to be one of the greatest national security challenges that this or any other generation of policy makers is likely to confront.” It could “destabilize virtually every aspect of modern life”, and is likely to breed new conflicts and magnify existing problems, from the desertification of Darfur and competition for water in the Middle East to the disruptive monsoons in Asia which increase the pressure for land (Campbell et al. 2007).

A comprehensive assessment of the security risks of climate change has been prepared by the German Advisory Council on Global Change (WGBU). The report concludes that without resolute counteraction, climate change will overstretch many societies’ adaptive capacities within the coming decades, which could result in destabilization and violence, jeopardizing national and international security. If effective solutions cannot be found, “climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments between the countries mainly responsible for climate change and those countries most affected by its destructive effects.” (WGBU 2007)

As climate change raises existing inequalities between rich and poor, pressures for long-distance and large-scale migration are likely to grow on a regional and global scale. Devastating effects in developing countries on food and water availability, and large-scale events such as monsoon failure or loss of glacial meltwater, could trigger large-scale population movements and regional conflicts. Developed countries cannot ignore the economic impacts and the migratory pressures and may be drawn into climate-induced conflicts in regions that are hit by the impacts. In an interconnected globalized world there is no protective wall against the regional impacts of global warming.

What can be done?
Whether societies are able to cope with the impacts and restrain the risks of climate change depends on their responses and abilities to solve associated problems. Some responses to climate change may rather aggravate the problem, by triggering environmental degradation, societal instability and conflict. The revival of nuclear power that drives nuclear proliferation and other risks or the unsustainable growth of biofuels are some examples.

If the military finds a new justification in fighting the impacts of global warming, this would hardly be a sustainable solution to the climate problem. There is no unavoidable link between climate change and war. The research literature does not provide sufficient evidence to support a clear causal relationship between security, conflict and climate impacts. Affected by climate change are in the first place human beings. While national and international security have been largely the domain of governments and the military, the concept of “human security” is centered on the security and welfare of human beings.

For the time being, preventing dangerous climate change is more an issue of science and politics than of the military. Rather than triggering a vicious cycle between environmental destruction, underdevelopment and war, it is important to foster the positive links between sustainable development and peace. As the WGBU report points out, climate change could also unite the international community by adopting a dynamic and globally coordinated climate policy.
The 2007 Nobel Peace Prize to Al Gore and the IPCC is a sign that the international community recognizes the relationship between environment and peace. Awarding the Prize at the same time to a politician and to a group of scientists demonstrates that both science and politics are crucial for finding solutions. Implementing these solutions requires joint efforts by the international community, including the United States, to help stabilize climate change at levels that will avoid disruption of global security and stability.

The potential impacts provide strong arguments for the developed world to take the lead in achieving the ultimate goal of the UN Framework Convention on Climate Change (UNFCCC) to "prevent dangerous anthropogenic interference with the climate system". With the formula of "common but different responsibilities" the UNFCCC assigned different roles for industrialized and developing countries in climate policy. As the largest emitters of greenhouse gases they have a particular responsibility as well as the power to reach an agreement on actually reducing emissions to a level that keeps the risks within limits.

To overcome diverging interests in post-Kyoto agreements, it is important to build coalitions for preventing dangerous climate change. A North-South conflict can be avoided if cooperative solutions are in the best interest of countries in climate policy. As the largest emitters of greenhouse gases they have a particular responsibility as well as the power to reach an agreement on actually reducing emissions to a level that keeps the risks within limits.

Common threats deserve common responses. As the Nobel Prize Committee states: Action is necessary now, before climate change moves beyond man’s control.

Selected literature

Adjunct Associate Professor Jürgen Scheffran is a researcher in the Program in Arms Control, Disarmament and International Security at the University of Illinois and has adjunct faculty appointments in the departments of political science and atmospheric sciences.

The development of the last 15 years has dramatically changed science, research and society, in particular, the role of science in the society. Scientists, engineers, students but also growing parts of the society ask the fundamental question: are there alternatives? The keyword for both science and society is sustainability.

What is sustainability?
Sustainability is a value-based aim and process with environmental, technological, political, social, economic and institutional implications. Sustainability requires that we organise our societies such that they evolve in harmony with nature; dominance over nature is a failed option.

Sustainable development as a concept is a compromise between different economic, social, environmental ideas (including strategies for development politics) and interests. I think this strengthens the real work and makes it useful for different activities and areas of work. The content needs continuous discussions, checking against reality and more scientific research.

Sustainability calls for a significant reduction in use of global natural resources and a sharing of these resources between individuals, societies and generations such that a maximum of well-being and dignity is achieved for all. It calls also for the creation of safe and peaceful living conditions and for respect for human, cultural and biological diversity.

The Challenges Have a Name: Sustainability
By Reiner Braun

The main responsibility for the changes lies in the industrialised countries, the so-called first world. Since more than 500 years these countries exploit the Global South by their colonialist and neo-colonialist systems, and since 200 years their industrialisation destroys the local markets and the worldwide environment. Changes in the first world must open possibilities for the development of the Global South.

What are the main elements for different parts of societies when we are discussing a sustainable future? In my understanding any process of development seeking sustainability should take the following criteria into account:

- Protecting against global warming: structures that ensure access without discrimination of any sort, including gender or income level to education, participation in civil and political life, health care, food and other resources, and means of production and labour opportunities; these structures should encourage people to bring their creativity into the political planning and decision process, and thus contribute new ideas and life styles to global sustainability

- Fair trade: establishment of fair trade patterns and regulatory mechanisms.

Finally under this heading I would like to mention one point which is for me one of the most important ones, or with the words of the German Nobel Peace Laureate and
formulator Willy Brandt: peace is not everything but everything is nothing without peace.

- Peace and non-violence: A world free from nuclear weapons and war. We will never forget that every year 1200 Billion US Dollars are spent on military budgets, 70% by the NATO countries and about 50 % by the United States. On the other side, more than 1.1 million people have to live with less than one Dollar per day, 50% of the world population have no access to a sanitation system. This must be changed. In the tradition of Joseph Rotblat we have to realize the old aim of the founders of the Pugwash movement: to make the world free of nuclear weapons which can destroy the whole planet earth. The dream of mankind since centuries and the worldwide peace movement will become reality: a world without war. What we need is a culture of non-violence that establishes and strengthens structures for peaceful resolution of conflicts.

For me it is an open question and a part of the scientific debate and research, whether we can reach these goals in a capitalistic system, or whether the people in the different societies have to overcome the capitalistic system in a democratic way moving towards a new more social, democratic and environmentally oriented society. But I am deeply convinced that the globalized neoliberalistic capitalistic system of today must be overcome. With the actual shareholder value system, only oriented at the short-term maximal profit of a small minority (of unbelievably rich people), it is impossible to realize a sustainable future. In this context, the Mexican Zapatistas can serve as a model for the “new discovery of the revolution”. The present system will definitely not be the last one. It is necessary based on integrated system approaches and the acceptance that science can never claim to fully tackle all aspects of reality.

We have to keep in mind the ambivalence of science and the dual-use character of many scientific and engineering discoveries.

What we need is:
- New priorities of research policy oriented at the ideas of sustainability, this means interdisciplinary research
- Enlargement of peace and environmental research and education at the universities
- Democratisation of the scientific institutions

Let me end this point with two concrete ideas, which are not new: INES has mentioned them in the declaration of the Amsterdam conference in 1996:

For many scientists and engineers there is only limited scope for acting; nonetheless, other options apply:
- To dedicate some of our time (5 to 10 per cent) to active participation in citizens’ organisations;
- To support personally, financially and scientifically engineers and scientists who are ill treated or persecuted for having acted for sustainability in their professional work, or for equity and democracy in their country and in international relations.

We all know that good proposals and ideas are not enough. The open question is how will they become reality. Let me say some word to the actors.

This year we have the 40th anniversary of the so-called “68-student-rebellion”, which changed the social structures of societies worldwide. More liberal social political culture, more democracy at the universities emerged. The activities helped to stop the Vietnam War and supported ideas of new relations between East and West (politics of detente) to overcome the cold war period. Revolutionary activities in many southern countries were a part of this period.

We should not forget that this time of deep changes was also a time of tears, torture and many killed persons above all by the new dictatorships in many countries of Latin America.

40 years later we again need deep social changes in the world’s societies towards sustainability. It is to be hoped, but it is not certain that these changes will be less bloody than in the past.

Reiner Braun INES Activities Coordinator; Executive Director of International Association of Lawyers Against Nuclear Arms (IALANA) www.ialana.net

The forces for these changes are growing
1. The different social movements, above all the activities critical of globalization (very important, but not the only ones are the social forums) and the peace movements
2. The delegitimization of the neoliberal capitalist system is growing in more countries. The majority of the world population including many people in the first world are afraid of the actual capitalist system and their own future or suffering under the unsocial conditions of this system.
3. The belief of many citizens that the present globalization is without any alternative but step by step to an end. The growing of alternative ideas, more social fights against unsocial politics and the destruction of the environment are happening.
4. New governments, above all in Latin America, come into power which are willing to go their own (national) way of developing their countries against the “Washington consensus”. They are abstaining from the Monroe doctrine.

My appeal is above all directed to the students: engage yourself: it is your chance and responsibility: realise the paradigm change to a sustainable and just world in peace.

Forty years after 1968 new challenges for scientists and engineers appear. They could play an important role in this transformation process towards sustainability, not as an avant-garde but giving support to the necessary deep changes through scientific research, educating people and helping in organizing good practices, being a part of the forces for change.

Reiner Braun INES Activities Coordinator; Executive Director of International Association of Lawyers Against Nuclear Arms (IALANA) www.ialana.net
Science and Democracy: The Dialogue Between Scientists and Citizens

By Jean-Paul Lainé

Science and Technology are Today at the Very Heart of our Societies

They concretely influence the life of all people at all levels, regional, national and international. They range from the basic day-to-day work conditions to their cultural surrounding and the media in their country, from politics to economy, from environmental issues to military budgets.

However the enormous development of knowledge and technologies is suffering from two mistakes: it is mostly happening in a few countries and is not shared amongst all populations. These characteristics influence the nature of research, particularly of applied research and the kind of people who benefit from.

The Impact of Science and Technology is Ambivalent:

- It depends on political and economic choices: applied science can produce the best and the worst as well. Great improvements in health (comfort, duration of life), mobility, communication and in training (I am not speaking of education at large) have been achieved resources; on the other hand – and this is frightening – huge means are devoted to destructive activities rather than the improvement of life conditions. The budget of military research and development (R&D) is not completely known because it is partly hidden. We should remember that the total amount of military expenses – all over the world - is by far higher than the aid to the developing world. In the mean time huge challenges threaten humankind, and some are provoked by human activity (global warming, pollution). Until now, facing natural, “external” threats (hunger, epidemics . . . ) humanity could implement adequate answers: will it still be possible when individual, collective ethical answers are needed? The responsibility mainly lies with decision-makers, politicians and economy managers but also, to some degree, with scientists. Too often they are prisoners of positivist, “technicist”, “occidental” schemes . . . and of their financial support. It is necessary to position research, in connection to its own development, in order to meet human needs, peace and environment.

“Science Policy has to be put Under Citizen Control”

Therefore, science policy, which has such huge consequences for our life, has to be put under citizen control: it has to be discussed by research staff itself and by all people as well. Practically – I am speaking here on behalf of my trade-union of university teachers of France – we consider that fundamental research, closely linked to higher education, is a public mission and has to be from a public service: this is the only way to ensure independence of religions, ideologies, political and economic powers and to guarantee academic freedom and justice in the diffusion of science. As far as the principle of the right of the people and of their representatives to intervene in the control of research is concerned, the difficulties are far greater: it requires huge development of education at large, culture, critical attitude, large-scale knowledge. It underlines the role of schools and universities, of families and all opportunities of education including media and cultural institutions. Social discrimination and underdevelopment are not only a tragedy for people but also a handicap for humanity: all civilizations, all cultures have something to bring to the universal knowledge, in all fields of science, from human and social sciences to natural sciences and mathematics.

Condition of Scientific Workers

We have to speak of the conditions of scientific workers, academics, researchers and engineers, which are the best means to ensure freedom, responsibility and true autonomy. They involve questions of status and salaries of personnel, of structures and management of labs, departments and all institutions, of evaluation at all levels – from people to institutions. Principles imposed by struggles, by victories in the past: management under the control of elected colleagues, assessment and recruitment by the peers are not details. But pressures are increasing to introduce a private way of management if not to directly privatize institutions. Threats and struggles are spreading out all over the world. I would like to emphasize the conditions of young researchers: they need protection, decent income and life; they call for a status of worker. From doctorates to seniors, status, freedom and individual/collective responsibility facilitate a courageous attitude, the faculty to say no, to denounce violations of ethics, of respect of truth, to be courageous “whistleblowers”.

The Role of Trade Unions

I would like to conclude on the role of trade-unions, associations and NGOs like ours. The priority is to spread the following idea: science, particularly the collaboration between science and society, is a main concern for scientists of course – but it is not always so obvious – and also for all the people. It is such a serious affair that it cannot be left in the hands of traditional decisionmakers. Our organisations must and can build bridges between the scientific community and the whole population, develop the feeling of responsibility amongst the researchers and the duty of intervention on scientific policy and all related items amongst the activists for “another world’. Thus INES, as well as WFSW – the World Federation of Scientific Workers- to which my trade union belongs to, as well as more than fifty organisations all over the world, has decided to support the project of organising a special day dedicated to science and democracy inside the World Social Forum, next January 2009, in Belem, Brazil.

Prof. Jean-Paul Lainé, International representative of SNESUP, (www.snesup.fr), Member of the INES Executive Committee
Program of the INES-UNAM conference: “Science, peace and sustainability”
Mexico City and Oaxtepec/ Mexico, February 29 - March 3, 2008

Friday, February 29, 2008 (Mexico City)
Opening: National Library, UNAM
Sustainability, science and nuclear weapons
David Krieger, Chair of the INES Executive Committee and President of the Nuclear Age Peace Foundation (NAPF)
Challenges for inevitable global and regional changes in society due to peace, science and technology developments
Sir Harold Kroto, Nobel Price Laureate, Florida St. University, USA
Views of responsible science
Elena Alvarez Buylla, Institute of Ecology, UNAM; Union of Socially Concerned Scientists (UCCS)
Closing remarks
Dr. Alipio Calles Martinez, Director de Megaproyectos, UNAM

Saturday, March 1, 2008 (Oaxtepec)
Welcome
Alberto Salazar, UNAM; Member of the INES Council; Sir Harold Kroto; Reiner Braun, INES Activities Coordinator, Germany
Workshop I
Globalisation and challenge for both: the responsible use of science and the role of scientists.
Raul Montenegro, Alternative Nobel Laureate, Argentina; Mauricio Schoijet, Mexican Academy of Sciences Chair; Jean-Paul Lainé, member of the INES Executive Committee; Syndikat National de l’Enseignement Supérieur (SNESUP) France
Workshop II
Militarization and nuclear weapons: the persistent threat to Human security.
David Krieger, INES and NAPF; Reiner Braun, INES; Marcelino Perello, Faculty of Sciences, UNAM, Chair: Gabrielle Krauskopf, INES Executive Secretary, Germany

Sunday, March 2, 2008 (Oaxtepec)
Workshop III
Environment, global warming and the survival of humans in a liveable world:
New challenges for science and research
Jürgen Scheffran, University of Illinois, USA/Germany; Amparo Martínez-Arroyo, Centre of Atmospheric studies, UNAM; UCCS, Mexico; Carlos Gay, IPCC, Mexico; Joaquin Ruiz, University of Arizona/USA; Chair: Elena Alvarez Buylla
Workshop IV
New ecological and economical strategies: The concepts of sustainability and their need for the developing countries
Omar Masera Cerutti, Centre of Research in Ecosystems, UNAM, Pugwash Mexico, member of the IPCC, Mexico; Raul Montenegro; Raul Garcia Barrios, UNAM, Regional Centre of Multidisciplinary Research (CRIM); Jean-Paul Lainé; Chair: Alberto Salazar Martinez
Résumé and results of the workshops and the plenary discussion
Jean-Paul Lainé
Speech: Latin and Central America - a continent of immense social and political change. What impulse can give it to the world? The rise of alternatives for a social and ecological development in contrast to the neo-liberal economic trend.
Heinz Dietrich, Universidad Autónoma Metropolitana, UAM

Monday, March 3, 2008 (Mexico City)
Plenary Auditorio Carlos Graef, Amoxcalli, Faculty of Sciences, UNAM, Mexico City
A sustainable world of justice, without war - a view from responsible scientists
David Krieger; Victor Toledo, UNAM; Jean-Paul Lainé; Marco Martínez, UNAM, Pugwash Mexico; Chair: Alberto Salazar
Closing remarks
Reiner Braun
The International Network of Engineers and Scientists for Global Responsibility (INES) is an independent non-profit organisation committed to influencing the role and the impact of science and technology on society. INES efforts focus on disarmament and international peace; ethics in science; responsibilities of scientists and the responsible use of science and technology; just and sustainable development.

INES was founded 1991 in Berlin at the international congress “Challenges - Science and Peace in a Rapidly Changing Environment” and has become a network of over 200 organisations and individual members.

Challenges for Scientists and Engineers
Rapid changes in our environment and our societies are forcing us to become more conscious of our role in the world. Science and technology are employed in a worldwide competition for military and economic power.

The impacts of this competition have global implications. We have entered a phase in which global developments are in conflict with basic requirements for human survival. Large stocks of weapons of mass destruction, the overexploitation of common limited resources, and a heavily unbalanced world economy provide fundamental challenges to human civilisation and may even threaten its further existence. Engineers and scientists play a key role, both in developing new knowledge that might threaten international security and in providing positive solution for the future. They are as much a part of the problem as they can be a part of the solution.

Innovative Reorganisation
A thorough reorientation of science and technology is necessarily based on integrated system approaches and the acceptance that science can never claim to fully tackle all aspects of reality. Only through innovative reorganisation and public accountability can the scientific and engineering communities meet their obligation to contribute to a sustainable future.

Ethical Principles
INES promotes the awareness of ethical principles and the specific responsibility of engineers and scientists. INES has been actively involved in “whistleblowing” campaigns which support those who have been victimised for acting upon such principles.

What you can do:
- Sign the Oaxtepec declaration! (see page 8)
- Visit our website and spread our news
- Make a donation and support the network’s effort for a sustainable future!
- Tell your friends about our work.

Your donation will help us educate and inspire people
Bank account at ABN Amro in Amsterdam/Netherlands. INES, IBAN: NL23ABNA0568896998 BIC: ABNANL2A

Join a strong and growing network!
For becoming a member please visit our website www.inesglobal.com or contact the INES office at ines.office@web.de

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