

*Check Against Delivery*

**H.E Kofi Annan** | 18 June 2010 | Richard Ernst Lecture, Swiss Federal Institute of Technology

## “Scientific Research and Society”

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Professor Richard Ernst,

Professor Markus Reiher,

Professor Ralph Eichler,

Dr. Eberhard von Koerber,

Mr. Ian Johnson,

Thank you for that warm welcome.

I am honoured to have been invited to give this lecture and to receive the second Richard Ernst Gold Medal.

Let me thank the Swiss Federal Institute of Technology and the Club of Rome who are co-sponsoring this year's lecture.

Your University can count some of the greatest scientists of modern times among its students, researchers and faculty members.

You continue to attract the brightest and the best which is why I view the Question and Answer session with some trepidation. Please go easy on me!

No one better represents this brilliance than Professor Ernst himself.

But there has never been anything narrow about his view of the place of scientific research in the world.

Professor Ernst constantly urges his colleagues to ensure their work helps build better, more equitable and peaceful societies.

His vision is at the heart of the ethos of this university.

We desperately need this spirit of discovery, creativity and optimism to be harnessed beyond your laboratories and lecture theatres.

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For never has science played a greater role in our everyday lives.

In countless ways, developments based on scientific research have made our world healthier, more prosperous and opened up new opportunities.

But the power of science to transform lives and societies also comes with great responsibilities.

We can see this in the life of one scientist who links Professor Ernst and myself.

Alfred Nobel was an extraordinary chemist and engineer but also someone with profound interest in wider social issues.

He hoped his invention of dynamite, with its terrible power, would deter war.

Instead, it led to destruction on a previously unimaginable scale.

His response was to use his fortune to endow a fund to encourage efforts to make the world a better and more peaceful place.

It was a similar journey followed by perhaps your greatest alumni, Albert Einstein who brought scientists together to reduce the threat of nuclear weapons his research had helped make possible.

He too urged scientists to look beyond their own narrow fields, to engage in society and help find solutions.

As Einstein once said: "Any intelligent fool can make things bigger, more complex and more violent. It takes a touch of genius – and a lot of courage – to move in the opposite direction"

I am here today to echo these sentiments and ask you to put your genius and courage at the service of the world.

There are many areas where you can make a contribution.

But let me focus on two priorities: food and nutrition security and climate change.

Today, more than 1 billion people suffer from hunger.

By the time the students in this room have grandchildren; there will be another two billion mouths to feed.

To meet that extra demand, global food production need to increase by 70%.

Let me take the example of Africa – the only continent which does not produce enough food to feed its own people.

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The science-based agricultural development, based on the ideas of another Nobel Laureate, Dr. Norman Borlaug, transformed food production in Asia. But it bypassed Africa.

As UN Secretary-General, I commissioned a study from the Inter Academy Council to analyze why this had happened and what should be done to address the problem.

The conclusions and recommendations of that study ultimately led to the concept of a “Uniquely African Green Revolution”.

It is based on promoting modern and sustainable agriculture with emphasis on improved seeds, and integrated soil fertility and water management practices for the benefit primarily of small-holder farmers who account for 80% of Africa’s agricultural production.

Dr. Borlaug’s vision and work still remain an inspiration for many organizations including the Alliance for a Green Revolution in Africa – or AGRA – that I have the honour to chair.

Through a combination of advocacy, partnerships and practical policies, AGRA works to help millions of small-scale farmers and their families lift themselves out of poverty and hunger by improving agricultural productivity and sustainability.

In the fight against hunger, the scientific community has a critical role to play through research and technology development.

We need you to step up co-operation with the continent’s own scientists and research institutions to help launch Africa’s own green revolution.

There is huge potential. African scientists may not have the luxury of the excellent laboratory and research grants enjoyed here in Europe.

But this has not stopped them leading the way in tackling the food needs of the continent.

Take the example of Monty Jones of Sierra Leone who was awarded the World Food Prize in 2004 for the development of New Rice for Africa – or NERICA.

It is a new rice variety, combining the high yield of Asian rice with the drought tolerance and weed competitiveness of its African counterpart.

Yet, despite success like this one, the challenges remain colossal.

First, many of the seeds African farmers use remain “inherently low-yielding and vulnerable to a host of crop diseases and pests”.

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We need scientists to improve conventional plant breeding in order to create new varieties of crops, more resistant to local conditions.

Second, scientific research can help develop new fertilizer and methods of biological nitrogen fixation that will have significant benefits for environmental sustainability.

Third, farmers need new efficient water management techniques that will get “more crop per drop of water” with the minimum use of chemical inputs.

Ultimately, it is only through strategic partnerships and networks between scientists here and those in Africa that we will be able to advance the power of science for development and greater food and nutrition security.

And it can work. By combining local knowledge with the potential of science, AGRA has already helped national scientists release over 90 new crop varieties, well adapted to Africa’s diverse agro-climatic conditions.

History shows that by translating scientific discovery into accessible and affordable technologies, the scientific community can help feed our world in a way that is environmentally sustainable.

Ladies and Gentlemen, the next move is yours.

The challenge of feeding the world is, of course, being made more difficult by the impact of climate change.

Increases in temperature and changing rainfall patterns are already turning vast tracts of once productive land into semi-desert.

More frequent storms and flooding are damaging crops on which people depend.

For global warming is not an academic exercise but a manmade reality for which the scientific evidence is incontrovertible.

Far from being limited to the environment, it is an all-encompassing threat – a threat to our security, our health, our food supplies and our social stability.

Successfully addressing the complexity of such a threat will require a shift similar to the Copernicus revolution.

A revolution towards a green economy with more efficient means of production that moves us closer to a carbon-neutral energy infrastructure.

But time is of the essence.

Scientific advances and technological innovations must be mobilized today if we are to develop the tools needed to confront this challenge in time.

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The approach must be threefold.

First, we must use less energy which means more “energy savings, energy conservation and improved energy efficiency”.

From the green light bulb to high efficiency diesel engines, scientific research must provide suitable and affordable alternatives for responsible energy consumption.

But for the impact of those technologies to be significant, governments must develop policies that reward sustainable production and consumption patterns and which encourage the public to demand them.

Second, we must start replacing current fossil fuels with non-fossil sources of energy .

The scientific challenge is to make the transition towards clean energy alternatives that are cost-efficient, viable and potentially available to all.

Wind, solar and biomass are the energy sources that your community needs to develop.

Make no mistake. That search for viable clean sources of energy is the scientific race of this century.

Third, we also have to accept the fact that “fossil fuels provide 81% of the world’s commercial energy supply” .

This is not going to change overnight. The challenge is how we can keep burning fossil fuels while reducing their impact on climate.

One solution would be to absorb CO<sub>2</sub> from the atmosphere.

New technologies of carbon capture and storage show that it is now possible to remove the most immediate environmental threat associated with fossil fuels while slowing down the rise of CO<sub>2</sub> in our atmosphere and reduce global warming”.

But despite their rich promise, none of these options alone will provide the answer.

Nor will they address the fact that today over 1 billion people do not have access to energy.

For future scientific research to unleash the potential of life-changing technologies, the greatest challenge will be to provide clean and affordable energy to the poor.

This is why it is vital to keep high on the agenda the particular challenges faced by the poorest nations.

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For while it is true that the impact of climate change can be felt everywhere, the tragic irony is that those who feel the worst effects are those who have done least to cause it.

The world's 50 poorest countries have contributed less than 2% of the warming gases in our atmosphere.

Yet it is the least developed countries and small island nations which are most at threat.

This is why the developed economies, responsible for past emissions and who have benefited through rising living standards, must lead by cutting emissions and funding adaptation and mitigation measures. Successful emerging economies should also take responsible steps to curb their greenhouse gas emissions.

Pollution has a cost and polluters must pay.

Again, scientific research can help the most vulnerable to adapt to climate change.

This will require a major transfer of additional resources, knowledge and technology, as well as increased collaboration between scientists and research policy institutes across the world.

Science, of course, has always been global in its outlook and collaboration has long been the norm.

This University's Alliance for Global Sustainability being just the latest example.

But such cooperation has, for far too long, been reserved to developed countries.

Half a century ago, India's first Prime Minister Jawaharlal Nehru declared his country was too poor not to invest in scientific research.

He knew it was science which would unlock the potential of his nation.

But few developing countries have been able to deliver on this ambition.

This places a great responsibility on institutes such as this university.

For science to be truly global, we need to foster international co-operation and ensure research is focused on the public good.

It requires scientists in the developing world to be fully involved not just in fieldwork or low-level research but also in establishing the research agenda.

It also requires a fair intellectual property rights regime to ensure that the benefits of research are shared across the globe.

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Only then can we make sure that science addresses the concerns and priorities of the poorest on the planet.

Finally, we must provide both universities and corporations with more incentives to increase their collaboration and share their R&D without denying those in the developing world access to technological advances at prices they can afford.

Ladies and gentlemen, let me address my concluding remarks to the students here in the audience.

My generation has seen many aspects of our world change out of all recognition.

In most cases, these changes have been for the better.

But for those now studying here, the pace of change will be even more rapid.

Your generation will produce more dramatic technological, social, economic, and political advances than any before it.

It is up to you to look beyond your own academic interests, your own country and accept your responsibility to future generations.

All of us want to see a day when everyone, not just a fortunate few, can live in dignity and look to the future with hope.

All of us want to live peacefully with one another, and create a world of harmony among human beings and the natural environment on which life depends.

We have the means and the intellect to meet these ambitions.

We are looking to you to provide the leadership.

I know we won't be disappointed.

Thank you.

**ENDS.**