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# **Mobilizing Science and Technology for Development: Peter Rieder's Commitment to the Promotion of Sustainable Agriculture in the Developing World**

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## **Summary**

**Peter Rieder was one of the very few professors in Switzerland who recognized the importance of technology for sustainable development in rural areas in the developing world. As initiator of the Swiss Center of International Agriculture (ZIL) and promotor of technology impact assessment studies in developing countries in the 1990s, he gave science, technology and innovation a high priority on the Swiss development agenda.**

**The year 2005 should give his early initiative new momentum: The UN Millennium Development Goals, approved by the UN General Assembly in 2000, have the primary purpose of reducing poverty and malnutrition in the World by half in 2015. A comprehensive interim Report on this UN Millennium Development Project published in January 2005 (UN Millennium Development Project 2005) observes that the goals will not be achieved by 2015 unless science, technology and innovation play a more important role in development.**

**In the following article I use some of the basic rules of political economy to explain, why, despite the efforts of Peter Rieder, science, technology and innovation have been dropped from the concepts of sustainable and equitable development over the past decade. I will then highlight some of the fatal consequences of this decision and discuss the current global initiatives to reverse these past mistakes.**

# **1. Science and Technology in Sustainable Development**

There seems to be a broad public consensus in affluent societies that science, technology and innovation may be necessary to make the economy more competitive and eventually create new jobs. But at the same time, people tend to denounce technological innovation as source of global inequality, the loss of job certainty, environmental pollution and new health risks. As a consequence, there also seems to be a broad consensus that developing countries, and especially the poorest countries in Africa, should not be exposed to the wickedness of science, technology and innovation but rely more on their own traditions and indigenous knowledge.

## **1.1 The impact of the Green Revolution**

Many cite the unintended consequences of the first Green Revolution as evidence that the introduction of modern technology in agriculture in the developing world did not solve the problems of hunger and malnutrition but just created new social and environmental problems. Moreover, the Green Revolution happened in the middle of the Cold War and was mainly sponsored by the United States. It was therefore often associated with a typical top-down approach, Western imperialism and a hidden political agenda (Anderson et al., 1991).

Even though there are many reasons to criticize the Green Revolution, especially its narrow supply-driven approach and its neglect of problems of farmers in marginal areas (Byerlee and Morris, 1993), there are also many positive developments that should be associated with the institutions of the Green Revolution: the Consultative Group of International Agricultural Research (CGIAR) has set up many crop research centers of excellence in developing countries and helped strengthen the role of local research universities and national agricultural research systems (NARS). Moreover, its hybrid varieties may not have helped in all parts of the world but they certainly increased productivity in agriculture and minimized the risk of hunger and starvation in Asia and Latin America (Evenson and Gollin, 2003). The impact of the Green Revolution in Africa was much more modest; first, because it initially just focused on higher yields for rice and wheat, crops that are not very relevant as staple foods in Africa, and second because of inadequate domestic policies

in that prevented effective research collaborations with universities and technology adoption by farmers.

## **1.2 The importance of learning**

Today we live in a Post-Cold War era where most policy decision makers do not associate development cooperation with a global war between ideologies anymore. Most decision makers today look at it as a welcome opportunity to improve their image by showing solidarity with those who want to improve the World. Yet, many of those self-appointed world do-gooders still have the ideological mindset of the Cold War. They tend to endorse the view of many anti-globalization activists who continue to argue that modern science and technology would merely serve 'Western interests' and the local 'elite' in developing countries but certainly not its poor and the natural environment. Ironically, icons of the anti-globalization movement such as Cuba have become leaders in promoting biotechnology research to improve public health, the environment and agricultural productivity with the ultimate goal to ensure the country's self-reliance (Lehmann, 2000). This is not surprising to those who remember that Karl Marx had a long-term view of economics and therefore recognized that advances in science and technology will determine which society will eventually rule over others. Joseph Schumpeter (1942) praised Marx as one of the few economists who did not ignore history, and Jared Diamond recently underpinned the overwhelming importance of science, technology and innovation for human development with scientific evidence in his best-selling book 'Guns, Germs and Steel' (Diamond, 1999). Therefore, independent of ideology, developing countries are realizing that investment in science, technology and innovation is essential if they want to become economically self-reliant, use their natural resources more efficiently and leave poverty behind. In addition, many have learned the lesson from the collapse of the Soviet Union and know by now that entrepreneurship and markets are key to rendering the economy more innovative and demand-oriented.

## **1.3 The importance of higher education and technological change**

The large public and private investments in higher education and technological innovation over the past two centuries have created stable democracies and economic wealth in Europe, and improved the state of

public health and the environment. It was social mobility, facilitated through higher education and private entrepreneurship that created a middle class, which eventually became politically organized and started articulating their particular interests and concerns in politics. And it was this educated middle class (the offspring of the workers and farmers) in Europe that induced governments to set up social institutions and laws that protect the rights of the potentially weak or repressed members of society and ensure that the natural resources are managed in a more sustainable manner, especially in forestry. Governments were forced to respect the interest of the middle class because they became increasingly important as taxpayers and voters. In Africa, the middle class is still marginal and their taxpaying money is irrelevant compared to foreign aid which sometimes makes up 50 % of the government budgets. So it seems obvious that politicians are more interested in pleasing donors rather than their own citizens.

The predominant contemporary stereotypes mentioned initially would suggest that technology creates inequality, uncertainty and unintended social, economic and environmental risks. This may be true in the short run, when technological revolutions indeed produce social and environmental costs in form of new powerful monopolies, the destruction of existing industries, technical accidents that cost human lives, environmental pollution etc. But over time, more competitors are entering into the new market. This leads to incremental improvements of the technology that aim at reducing the risks to human health and the environment. Moreover, the growing competition leads to a more efficient use of the resources and eventually brings down the monopoly and makes the technology more broadly accessible through mass production and subsequent price cuts (Schumpeter, 1942). Technology is therefore threatening rather than supporting existing power structures and social hierarchies and may lead to the empowerment of repressed people (Diamond, 1999). The internet is just the most recent example. Therefore, in contradiction to widespread belief, technological innovation actually reduces inequality, creates social welfare and minimizes social, economic and environmental costs that come with it on the long run. Evidence in history is abundant (Schumpeter, 1942; Mowry and Nelson, 1999; Rosenberg, 2000).

## 2. Self for Self-Help – for Whom?

Decision makers involved in development cooperation have nevertheless firmly adopted the prevailing stereotypes in their national and international political agendas. The terms science, technology and innovation seem to be banned from international treaties related to the promotion of development or the protection of the environment, as well as the websites of national and international organizations involved in international development and cooperation. Poverty Reduction Strategy Papers (PRSP) that describe a country's macroeconomic, structural and social policies and programs to promote growth and reduce poverty, never even mention the intention of promoting higher education and technological innovation. Maybe this is because governments are asked to prepare these PRSPs through a participatory process involving civil society and development partners, including the World Bank and the International Monetary Fund (IMF), but are not really required to consult their own educated citizens or national academia.

When I inquired about the reasons why the role of higher education and technological innovation are not part of the agenda of development organizations the answer was always the same: 'Our goal is to serve the poor and not the corrupt elite'. This implies that national universities in developing countries are just producing corrupt bureaucrats that can buy new technologies for their own pleasure. But is this not exactly the biggest risk for African development? Why are African universities not able to play the important role of engines of social and economic change as they did throughout the history of Europe? Could it be that they were never allowed to play a constructive role in development? Could it be that aid as percent of Gross Domestic Product (GDP) is inversely proportional to the quality of national universities in Africa? William Easterly suggested that this might be the case for aid as percent of GDP and GDP growth per capita over the last 30 years (Easterly, 2002). So the questions would be worth investigating.

The strategy of deliberately ignoring the important function of higher education and technological innovation for social and economic change may actually make sense for development organizations from a political economy point of view. For as long as the African universities do not have the funds to set up professional teaching and research programs that help address the huge economic, social and environmental challenges in the country there will always be a need for international development assistance to do the job. In other words, development organiza-

tions feel authorized to play the 'good elite', as long as there is a bad elite. The problem is that educated local people may be much more likely to find creative solutions for local problems because they think more entrepreneurial and are more familiar with the cultural, environmental and socioeconomic settings. So this leaves us with the popular slogan 'self for self-help' which currently seems to be better applicable to development organizations than the local communities in developing countries.

### **3. A Call for a Substantial Reorientation of Development Cooperation**

Yet, this is not to say that people working for development organizations have bad intentions or useless ideas, but the rules of the game force them to take into account the interests and perceptions of taxpayers and private contributors in the donor country rather than the true interests of the people in the receiver country (Easterly, 2002). The people in developing countries do certainly not object to a development organization that comes with a project idea and the money to fund it. But they do not object because they find the project idea brilliant but because they get an opportunity to earn some money – and if this also involves some advocacy work for political issues that reflect the dominant world view or ideology of Western donors then be it. The unfortunate result of that is that many of the local political activists in developing countries have abandoned campaigns for truly local issues such as access to natural resources, technology and higher education, and instead embraced 'global issues' of concern, such as the potential negative impact of new technologies and economic liberalization (Bob, 2002). These 'global issues' may be a real issue of concern in the mindset of people in affluent societies where the benefits of entrepreneurship and technological innovation are largely taken for granted while its inevitable risks are increasingly perceived to be unacceptable. But the circumstances are quite different in developing countries where the economic, social, health and environmental problems are not due to too much technology but lack of access to technology.

The report 'Innovation: Applying Knowledge to Development', published in 2005 by the UN Millennium Task for on Science, Technology and Innovation, contains detailed strategies on how

- to change some of the ruling policy mechanisms in foreign aid,

- to bring more science advice to governments,
- to create the infrastructure and market conditions that facilitate technological innovation and entrepreneurship also in marginal rural areas,
- to strengthen the collaboration between universities and the private sector in Africa,
- to make local universities more useful in addressing local economic, environmental and social problems.

The report is not the only ongoing effort to create new momentum for the role of science, technology and innovation in development. Tony Blair's Commission on Africa largely endorses the strategy and is also urging the international community to finally create the political will to do it. The UK will have the presidencies of the G8 and the EU in 2005, and Africa will be at the centre of the agenda (Blair, 2005).

#### **4. Learning from Peter Rieder's Initiatives**

These are all promising signs that Switzerland may also pay more attention in the future to the role of higher education and technological innovation in development. According to the Website of the Swiss Agency for Development and Cooperation ([www.deza.admin.ch](http://www.deza.admin.ch)) 'Swiss development policy is based on: a) an awareness of the growing inequalities between different regions of the world, and b) an acknowledgement of Switzerland's responsibility, as a rich country, to be involved in reducing these inequalities'. If the Agency is really serious about reducing inequality in the long run, it should also start supporting universities in Africa and ensure better access to knowledge and technology. Peter Rieder made a first step with the establishment of the Swiss Center for International Agriculture (ZIL) and his research focus on the future role of agricultural biotechnology (not necessarily genetic engineering) in developing countries. Under his tenure, many research collaborations were set up with universities and research institutes in Asia, Africa and Latin America; and thanks to the support of ZIL, ETH Zurich became the global leader in cassava crop improvement and management research (Aerni, 2004). Cassava is one of the most important crops in subsistence agriculture in Africa. In this context, Peter Rieder stands for Switzerland's genuine long-term commitment to sustainable and equitable development in developing countries. For the sake of sustainable devel-

opment, we all hope that the new global initiatives will produce new momentum in Switzerland for the approach Peter Rieder has advocated so courageously.

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