



*Dedijer: information revolution*

## A basic capacity to absorb and create knowledge

Hiroshi Harada

THERE is much that can be said on the topic of 'Science and Technology for Development', but as far as developing countries are concerned it is useless unless they have in the first place a basic capacity to absorb and create scientific and technological knowledge, and to be adept in its use for productive and commercial purposes. This obvious fact seems, nevertheless, to be often overlooked, as is the fact that there is no short cut to acquiring it.

Education is the only universal means for forming this capacity from the innate intelligence available. And in this context, education must not be regarded solely as a process of passing on information and experience, but one which stimulates the curiosity of its recipient and develops a sense of applicability of the knowledge acquired. It must increase practical ability and the powers of observation and communication. It must instil mental self-discipline and ruthlessly maintain standards and integrity in study and research. These — and a willingness to be self-critical — are essential for self-reliance, both individually and nationally.

The process must be started deliberately at the primary level of education. It is too late at the secondary and higher levels, when the sheer weight of knowledge to be acquired can inhibit any burgeoning sense of mastery over it. This applies whether the product of the educational system is a professional scientist or technologist, or a layman. Indeed, an appreciation by the latter of what is involved is essential if the impact of science is to be accepted and the technological revolution necessary for development is to take place. Otherwise, scientists and technologists become, as is seen too frequently in developing countries, elitist and largely ineffectual in the development process.

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## Common sense, perseverance and ingenuity

John Ziman

IN the short run, the developing countries are seeking scientific and technological information; in the long run, to make use of that information and to serve their own needs, they will need research capability.

● In the short run, that means material facilities; in the long run, these are merely the instruments of scientific institutions.

● In the short run, a scientific institution is a bureaucratic organisation; in the long run it must grow into a scientific community.

● In the short run, a scientific community is made up of technically qualified personnel; in the long run, it depends on the leadership of its scientists.

● In the short run, a scientist is an expert who has passed the examinations for a PhD; in the long run, this is only an apprenticeship to the profession of research.

● In the short run, the goal of research is to make specific contributions to knowledge; in the long run, it is to exercise curiosity and to solve problems.

● In the short run, problems are often solved by the application of sophisticated, specialised expertise; in the long run this calls for common sense, perseverance, and open mind and ingenuity.

A scientific institution with some capability for research can be set up in about 5 years. Scientific workers with some research experience can be trained in about 10 years. It takes a generation or so of education and cultural change to foster the personal qualities needed to solve practical problems by scientific methods. This path is long and narrow, but it is the only known way. For the developing countries there is no time to lose: they, and we, must start now.

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## Breaking the monopoly on scientific knowhow

S. Dedijer

I SEE three threats in UNCSTD to developing countries developing their own capability to find out, to discover, to invent and to innovate in both predictable and unforeseen circumstances. Two of them are strongly backed proposals for deceptive solutions to the problems which arise from the fact that almost all the global scientific and technological output, capability and knowhow is concentrated in only 30 countries, from which the

remaining 80% of the world has to import.

The first threat would arise if UNCSTD set up one more UN organisation to 'deal' with the problem, without a critical evaluation of the efficacy of the existing ones. The second threat could come from the search for solutions to the problem in political attacks against 'capitalist dependence' of the developing countries without the realisation that such non-'dependent' countries as the USSR and China are almost colonially dependent on the science and technology of the democratic countries.

The most serious threat is that the developing countries, as shown by their UNCSTD national papers, have done their homework badly. Not one of them seems to have yet discovered the very fact of the new electronic information revolution, or has realised its implications for development. This includes the fact that information democracy — the right and motivation of everyone in a country to obtain, produce, distribute and withhold information — is becoming essential for a country's ability to acquire and create scientific and other knowledge and knowhow. Democracy, in other words, is becoming a productive force.

UNCSTD itself offers the delegation from every developing country the opportunity to test critically the approach, the findings and recommendations in their national papers and to apply them creatively for national goals after UNCSTD.

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## Active partnership of Third World scientists

Yongyuth Yuthavong

THE challenge of science and technology today is not to show that it can give rise to social benefits, but that these benefits are produced where they are most wanted — in the Third World. There is an urgent need to direct a far larger part of world scientific and technological activities specifically towards Third World development. Solutions to many development problems have to be sought largely within the developing countries themselves, and their scientists and technologists must be given the necessary means to search for them. Solutions to many problems, for example in the fields of population, nutrition and health, are already known but lack implementation. An integrated approach, including all necessary social, economic and political components is needed.

The developed countries have the capacity to find scientific solutions to many basic problems concerning the survival of mankind, and should make more effort in this direction. However, ultimately, effective action in the Third World