

# Importance of Collaboration and Networking in Capacity Building in Basic Sciences in the Developing Countries

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## Basic Science in LDCs and Developing Countries

- Basic sciences ie. Physics, Chemistry and Mathematics, are chosen by fewer students worldwide, even in the developed nations.
- The main reasons are scarce job availability and lower income prospect.
- The situation is very similar for LDCs and developing countries. Non-scientist politicians and administrators give very low priority to science due to lack of vision.
- South Korea and Malaysia had vision for development and they attracted in-country and expatriate scientists by providing them with higher remuneration and adequate facilities.
- Political VISION & WILL are primary requirements for developing Basic Science in under-developed countries.

# Lack of minimum number of scientists

- Science teachers for secondary and higher secondary level are difficult to find.
- Result:: **Basic science education is below average.**
- A minimum critical number of scientists are required to develop a particular field of science.
- That critical number is not present in most of the developing countries.
- The result:: **scientific development is seriously impaired.**
- Whatever is done is usually based on isolated personal efforts.

# Lack of instrumental facilities

- Personal efforts often generates frustration due to lack of research facilities.
- For experimental sciences, lack of instruments is the major hurdle.
- Formation of Groups or Clusters within a department or within several departments can help in procuring some instruments through the university.
- A determined worker may find some funds locally and, in very few cases from international sources.
- Collaboration is an absolute necessity for securing services of sophisticated instruments.
- This collaboration is usually North-South, but in some limited areas Regional or South-South collaboration is possible.

# Spirit of Cooperation within the country or in the region is at low level

Unfortunately, in my personal experience, the **spirit of cooperation is very much lacking in the South.**

Even in a particular department, one faculty member is hardly collaborating with another faculty working in similar fields.

Inter-departmental or multidisciplinary collaboration is a necessity realized by many but practiced by very few in the South.

Regional South-South or in some cases South-North collaboration has contributed in the development of basic science in some areas.

Much more is needed to be done to stimulate spirit of cooperation among scientists in the South.

**True patriotism or concern for humanity may induce such spirit.**

# Preference for North-South collaboration

Most of the scientists, working in the universities and research organizations in the less-developed countries in the South, did receive their **higher degrees in the North**.

Many of them are naturally **inclined to North-South collaboration**.

In many cases this leads to working in the North, publishing some papers and securing promotion in the home institution.

**This does not help development of research at home.**

The collaboration should be South-North and not North-South.

South-North collaboration can be beneficial in two ways:

- (a) Knowledge & skill can be better transferred if a scientist from an advanced laboratory spends some time in the South.
- (b) Post-graduate students from the North can do a part of their work in the south.

# Collaboration leads to Networking

Collaboration at the National and Regional levels leads to Networking.

Networks give some formal and structural basis for continued collaboration.

Exchange of scientists and young post-graduate students within the Networks facilitate transfer of knowledge and skill among the collaborating institutions.

Networks are better placed to organize scientific Seminars, Symposiums and Conferences exposing larger number of research workers from within and outside the networking institutions to latest scientific activities.

International scientists are drawn to the conferences usually leading to expansion of collaboration.

Networks can draw attention of development partners and donor agencies.

# National, Regional and International Networking

- Networks can be at the National level:: Example NITUB
- Networks can be Regional:: Examples are many like NAPRECA, ANRAP, LANBIO.
- AFASSA is an example of International Network.
- Except some specific sources like ISP, Networks involved in Basic Science do not find any easy way to get funded.
- Scientists involved in Networking will have to work hard to draw attention of development partners and donor agencies for funding.
- National Governments of the countries involved in Networking are usually not interested as they hardly understand value of scientific collaboration.
- Again scientists of the respective countries are to lobby their governments to get grants for Networks.

# Networks supported by ISP

- ISP is unique in encouraging formation of Networks and giving continuous support to them.
- IFS supports Network activities but they are limited to their Grantees only.
- UNESCO and OPCW have supported Networks in a limited way.
- ISP Networks are primarily in the Chemical Sciences; some with a touch of biology.
- Africa hosts most of the ISP supported Networks. All Networks are in Africa, only 2 are in Asia, one in South America and one includes all these 3 continents (AFASSA). AFASSA is not truly a Network in itself, it is a Network of Networks.
- The two Networks in Asia are a little different than all others. ANRAP is a disease-targeted natural product Network. NITUB is also a very special Network dedicated to keeping scientific instruments working and thus directly contributing to basic science.

# Positive effects of Networks supported by ISP

ISP supports Research Groups.

Successful Research Groups led to formation of Networks.

So, the focal points of Networks usually started with success stories.

Most of the Networks have contributed significantly in bringing scientists together and transferring knowledge and skill to the less privileged laboratories. A good number of young scientists specially post-graduate students have been trained in laboratories with relatively better facilities.

Many Seminars, Symposiums and Conferences have been continuously organized by the Networks at the National, Regional and International levels.

Local scientists and students have been benefited.

# Capacity building through ISP support

- By supporting Research Groups, ISP has contributed significantly in developing instrumental facilities for research. Much of the instruments in the laboratories of ISP supported Research Groups came through ISP grants.
- The capacity building has been, in many cases, augmented by IFS Grants to individual scientists in a Group.
- OPCW has contributed in donating some costly instruments to successful Research Groups supported by ISP.
- Capacity building also means human resource development. Training of young scientists and postgraduate students have contributed to research capability. Many senior scientists also have been exposed to advanced laboratories in Sweden and elsewhere in Europe.

# Development of Basic Sciences by ISP support

Basic Sciences have been developed by ISP support. It will be difficult to quantize such developments.

The improvement in instrumental facilities in a particular research group in a department has contributed in the overall development of research activities in the department.

Some faculty members from the department and from other departments have used the facilities.

Competitive research efforts have improved quality of research for others outside the ISP supported Group.

Jealousy has also been created, impeding certain activities in the Group.

The overall impact is improvement of scientific activities.

# What more can be done?

- Networks may be given more importance in developing basic sciences in the South.
- Laboratories with leading roles in Network activities may be given due prominence in considering funding so that they may become 'Centres of Excellence' capable to provide better service to the networking institutions.
- Other funding agencies like IFS, OPCW, UNESCO, TWAS etc. may note the above two points.
- Networks and participating laboratories should seek fund from other agencies, directly or through respective governments to improve the activities of the Networks.
- Successful laboratory leaders have a better chance of getting funds from sources other than ISP.

# Responsibility of scientists in the South

- In the ultimate analysis, it can be said that it is the responsibility of the scientists in the South who has to shoulder more burden with hard work to improve basic science in their respective countries.
- The scientists have to note that without improving science education at the pre-university and undergraduate levels, basic science will not improve as may be expected.
- Lobbying is required everywhere and at all levels. Basic science also requires strong lobbying by the scientists at the Ministerial level as well as at the highest level of the government.
- Although in many cases Ministers are simply decorative, but they should be invited to opening/closing ceremonies of Seminars/Symposiums/Conferences. This is just a part of the lobbying.

# Outlook and policy decisions by the North

Swedish support in general and ISP funding in particular are practically without strings.

Many development partner countries have strings attached to their support.

Government outlook and policy decisions taken by the donor countries are their inherent internal matter.

We can only urge the development partner countries to broaden their outlook and take policy decisions in such a way so that Basic Science is developed in the South.

The consequences of most countries in Africa, Asia and South America, remaining under-developed with poverty, pollution and disease will affect the developed nations equally.

Development of Basic Science is a primary requirement for overall national development.

# Change of Vision in the country concerned

- Unfortunately, the governments in the poor countries in the south do not realize the fact.
- We, scientists must try hard to convince the policy makers in our respective countries to have a different mind-set.
- We, through our universities or Academies of Sciences should put forward Visions for the future which governments may pick up.
- Without changing the Vision and the Will of the politicians (or non-political rulers), science will not develop in the south and we will remain LDCs or at the bottom of the developing nations.
- We have to shake up the beaurocratic machinery and the government.
- The alternative is to get into the government and take proper policy decisions.

# Knowledge-based Society and Survival with Dignity

- **Twenty first century is termed as knowledge-based society.**
- **For expanding your knowledge base Basic Science is the key.**
- **So, we must endeavour to improve Basic Science in whatever way we can.**
- **For surviving in this competitive world there is no alternative.**
- **We must excel in Basic Science paving the way for its application in this digital age and create a future for our next generation to live in dignity.**

Thank you for your kind attention