

Short Communication

Re-orienting developing countries scientific research for industrial development

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The development of countries is now mostly dependent on their research and how fast they can convert the results into tangible products and services. Employment of research for industrial development is not being encouraged in developing countries. Developing countries must engage more in research that will contribute positively to their economy. Encouraging collaboration and entrepreneurship within and across different disciplines will serve as impetus to create alternative local products as well as chart a course for a competitive future. The transfer of innovative research and technology from our universities and research centers into the economy can be driven by university lecturers and researchers from institutes.

Key words: Research, science, industrialization, developing countries.

INTRODUCTION

Research is by far the most established method for advancing a society. In the modern era, the development of countries and its people is to a very large extent dependent on the quality and quantity of their academic and industrial research (Bayarcelik and Taşel, 2012). The dramatic increase in the scale and complexity of scientific research worldwide has yielded exciting discoveries with an array of practical applications in the quality of life (Cooke and Hilton, 2015). This remarkable success of science has led to innovations in advanced manufacturing, information technology and biotechnology and others that are profound and have created so much wealth all over the world.

Scientific research offers limitless opportunity for the creation of knowledge and wealth. Results from laboratory research ought to get out to the real world where they

can make tangible differences in people's lives and create economic development. Re-orienting developing countries' research for industrialization should now be the priority of institutes and universities' laboratories.

ENCOURAGING COLLABORATION

The huge mistake most developing countries' scientists make is to continue deciding alone what research should be conducted. The growing scale of science has been accompanied by a dramatic shift toward collaborative research (Cooke and Hilton, 2015). Contemporary research requires leadership in order to galvanize the various efforts of scientists. Such collaborative research can serve as a means to organize and direct various

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talents for product development so as to reduce dependency on foreign products.

The current situation in most countries where an individual scientist is funded will hardly lead to a marketable product or process. Encouraging collaboration across research institutes, universities and industrial laboratories is very much needed in all developing countries. In addition, a very talented researcher can be identified by government agencies (or industry) to assemble a team from various institutions to build prototypes from their research findings or even start a small factory. Enterprising individuals among the collaborators can be further funded to commercialize parts of the research and build companies around it. Hundreds of companies and products can emanate from such projects.

ENGAGING IN MEANINGFUL PROJECTS

The strong reliance on developed countries for manufactured products and services can be easily challenged if developed countries direct more of their research towards economic development. Moreover, transcending from mere academic researchers to passionate innovators and manufacturers will bring financial benefits to both lecturers and their institutions. Nevertheless, coming up with a good researchable topic that will make a difference in the larger society is one of the most difficult tasks facing scientists. This requires developmental steps to make the results from the research into products or services which people and companies will want to buy. Development is also necessary to convert research into a patent that can generate royalty for the investigators and institution.

In order to stimulate cutting edge work that leads to useful commercial products, services or patents, there is need to identify gaps and prospects, while giving attention to local and national problems (Kampers et al., 2022). The current research gaps in developing countries are so numerous and there is urgent need to focus on areas that is driving development like biotechnology and software development. However, other important research with future economic impact like battery technology, solar energy, vaccines, laboratory and industrial kits should also attract attention of developing countries' scientists.

Instead of wasting much needed funds in buying unnecessary expensive equipment for experiments that will not be of benefit to our community or country, developing countries scientists should opt for simpler and locally made apparatus and kits where possible. Universities and governments should encourage the establishment of incubators and small factories, where scientists can take a small idea and build a commercial product or service around it (Tonukari, 2008).

Well-funded research into evaluation and local processing of raw materials will improve their value and earn better revenue. The many local alternatives to

imported laboratory apparatus and chemicals ought to be identified and patronized. Similarly, developing countries' scientists can produce cheaper and better equipment for artisans and factories. Developing countries should draw and constantly update a list of equipment, component, food, feed, chemicals and services they want their researchers to develop local alternatives to.

The importance of employing science and technology to locally manufacture most of what we import will unleash further innovations as more income is generated (Aghmiuni et al., 2020). Currently in most part of the developed world, universities encourage the establishment of businesses in the science and engineering sector. Group of developing countries' scientists can also come together to build electric cars, batteries, inverters and local solar panels. Chemistry or chemical engineering departments can take the lead in establishment of small modular refineries, while biochemistry and microbiology researchers can team up with engineers to produce commercial enzymes and bio-organic chemicals (Tonukari, 2022).

RECOMMENDATIONS

Potential economic benefits should be the key focus for funding any scientific research in developing economies. Leading scientists, engineers and industry leaders should be called upon to evaluate patents or products prototypes in order to nominate projects that should be well funded for large scale production. Such projects must have potential economic or social values. For example, evaluation of local materials in the production of chemicals that we currently import, or setting up a collaborative group to locally produce alternative drugs to replace those that are currently manufactured abroad.

Annual national exhibitions should be instituted to encourage entrepreneurial scientists to display their products, services and patents. This will set a stage for productive scientists to meet their peers and establish innovative solutions, new collaborations and partnerships.

This will also fast track the transfer of related technologies to the private sector. Furthermore, competitive funding through grants and loans to such scientists based on the potential of their products or services should be a top priority for all government in developing countries. Such fund must be targeted for the commercialization of proven products or processes that will satisfy some societal or economic needs. Such annual exhibitions and competitive funding will ultimately drive commercial growth, establishment of factories, production of machines, as well as generation of hundreds of thousands of high-level jobs.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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