Research and its social significance

Biophilic attitude should be the indispensable factor in scientists; investment priority should be given to current social problems

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It is we human beings who are to be blamed for the near or total extinction of many life forms with whom we coexist in this planet. Loss of biodiversity alters the ecosystem and makes human life increasingly difficult in many defined ways. But that is only the tip of the iceberg. Current rates of loss of biodiversity are high and accelerating. However, preventing extinction is practical, but requires enough investment. It is always a nice idea to fund new ideas. However it is imperative that the first and foremost investment priority should be concerned with the current and imminent threats in our well being.

In an essay in the journal Science, Roger Highfield writes, "I was the first person to bounce a neutron off a soap bubble. It wasn't much of a contribution to the scientific canon, I know, but it was a fun." (1) It is one of those many researches which are carried out without considering their social significance and without focusing on current social problems. How wise is it to invest fund and use sophisticated equipment just for fun in this resource-strapped world beset with innumerable problems where, for instance, degradation of environment, climate change and loss of biodiversity have created and are creating undesirable consequences threatening our very existence in this planet?

Let us take an example of tropical forests of Amazonia, Congo and New Guineas, which form one of the biggest carbon sinks of this warming planet. The forest is being cleared so rapidly that hundreds of species are on the verge of extinction. Edward O. Wilson, the distinguished Harvard biologist calculates in his new book that to protect one tenth of Amazonia from all threats would cost a mere $250 million, an amount equal to the bill for the failed Pathfinder probe to Mars (which was sent with the primary purpose of seeking new life forms) (2). We are allowing a big carbon sink to shrink and hundreds of life forms to be endangered in the Earth, and seeking new forms of life in Mars. The Pathfinder has more to do with the ambition of the scientists, or those who direct them than to the service of humanity.

It is not that scientists need not work in those fields which do not seem to contribute anything to human welfare; they have to. When studies on spin of proton were going on few people might have thought it would have any significance to human beings. NMR imaging which is the outcome of that study is one of the indispensable tool in medicine now (NMR imaging is used to detect brain haemorrhage).

Jayant V. Narlikar recalls a story told by Subrahmanyan Chandrasekhar, the Noble prizewinning astrophysicist in an essay in the journal Nature : During a press conference in the 1930s, about the proposal to build a 200-inch telescope on the Palomar Mountain, Edwin Hubble and Arthur Stanley Eddington were asked what they expected to find with the new telescope. Their reply was : "If we knew the answer there would be no purpose in building it." (3)

Even the scientists were not 'sure' what they were going to find out. But it doesn't mean the funding is meaningless. In fact astronomy has advanced whenever the unexpected has occurred. Progress of human knowledge comes to a standstill if new ideas, which apparently lack social significance at the moment, are not funded. Importantly, no scientific knowledge can be value free. Sooner or later it will be applied for the service of humanity.

We, the Nepali scientists, have a totally different story. Very small fund is allocated for research and scientific development. We cannot make fun with research like that of Roger Highfield who had a wine-soaked life style, neither can we invest in study of extraterrestrial life. Researches at the frontiers of human knowledge cannot be our part. Even we should be careful to invest in basic science. The most important thing is that we should be careful in scientific investment which should primarily be concerned with our major social and national issues. Investments in basic science and applied science would give a big return for a long time in poor countries. Such investments strengthen economic status building expertise capability which, on one hand smoothen lifestyle alleviating poverty and, on the other hand prepare the nation to follow the research model that led to the scientific enterprise of the industrialized countries.

The purpose of all human doings is – and should be – life. It is the ultimate purpose behind all activities. Once we accept human life as the ultimate purpose, it raises issues not only with the climate/environment and resources, but also with other living beings. Humans are always related to plants, animals and microorganisms for their survival. The dependency of humans on a particular organism is not so intense as of other organisms because of our high level of intelligence which is utilized for our benefits. But it is only a matter of quantity, not of quality. In the intricate relationship of various living beings in nature, all life forms are connected to each other, and this is what we call ecology. By extension it means for the smooth living of one form, others should not be disturbed. Thus any advantage for humans should not mean adverse impact to others.

And, the bad news is that as we are discovering more and more about the relationships between different life forms for their survival, biodiversity is being lost at an alarming rate for our petty interests. Current rates of extinctions are high and accelerating (4). But the good news is that different groups of experts have concluded that preventing extinctions is practical, but requires innovative measures (for e.g., 5), at the top of which remains sufficient fund investment.

The 25 biodiversity hotspots of the planet, areas with exceptional concentration of endemic species facing exceptional threat of habitat destruction, cover only 1.4% of Earth's land surface and contain the last remaining habitats of 44% of the planet's plant species and 35% of terrestrial vertebrate species (2). The hotspots represent ecosystems that have already lost at least 70%, and many have lost 90% of their original vegetation. It would require one time cost of $25 billion for the protection and adequate management of all hotspots. However, the hotspot strategy has received only $700 million (cf 6). The sum required for protection and adequate management is large but it is of the same order of magnitude as the individual wealth of world's richest citizens – and, importantly, 1/1000th (or 0.1% of) the value of the ecosystem services that biodiversity provides annually (7).

Scientists have explained many ways how loss of biodiversity alters the ecosystem and makes human life increasingly difficult. But that is only the tip of the iceberg. Unseen consequences can be far more threatening. Preserving biodiversity should be the first, or one of the first priority in public, governmental and inter-governmental investment.

It is not that the search for life in Mars is value free. Some day it may have implications for humanity. Funding new ideas is always a good thing. But ironically biodiversity is being lost at an alarming rate in Earth due to lack of (sufficient) investment and such huge funds are allocated for 'Pathfinder' or other ambitious projects. Researches which have less social significance should not be done at the cost of biodiversity and environment or by cutting back on funds which could otherwise be invested in improving public health and keeping cities clean. A scientific knowledge should not be gained at the cost of smooth living because the purpose of whole study is life. As Wilson postulates, we should have a sense of biophilia, "the innate tendency to focus upon life… and to affiliate with it emotionally."

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