Of Sloppy Policies and Apathy

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WHEN IT comes to matters of scientific research and technological development, policy makers in Pakistan have managed to come up with some fairly impressive policies. Contrary to popular belief, these policies do take into account the demands that need to be met. The problem, however, lies in implementation.

This is not to say, however, that there are proper research and development facilities at our disposal. In fact, there aren't many specialized programmes that could possibly encourage all those desirous of pursuing a career in science.

Our policies are rather sound, but the trouble is that we don't really know how to implement them. Either that or we are simply not motivated enough. If we analyse the past and current policies, we find a pattern suggesting that shortcomings have been consistent over the years. Typically, policies are flawed in one of the following ways:

1. For starters, the policies often have objectives that are too broad. They largely consist of wish lists, focusing on what should be done instead of how one can go about achieving those goals. Objectives must be quantified and unless that is done, there is absolutely no way to measure the outcomes.

2. Policies lack clear-cut implementation plans. These are usually discussed in general terms, but targets that must be achieved within a given timeframe are not set. Obviously, without a target-oriented plan, the policy is likely to meet the fate of one of those classic government documents that are put on the bookshelf, never to be used again. The officials then continue to ask, "So what shall we do?"

Note that the success of any policy is determined by how well it is implemented. A less than perfect but workable plan is better than a perfect plan which is not practical.

It is worth mentioning that policy makers in Pakistan are unable to see beyond short-term goals, when they actually should try to devise schemes that focus on long-term attainable targets. So what is so wrong with short-term strategies? Plenty actually.

For instance, short-term plans inadvertently ignore basic research which is required in industry. Secondly, scientists and researchers are often reluctant to collaborate with universities and to perhaps make them partners in the long run. Then, there is a great deal of pressure to produce results right away, which can be counter-productive in the long run.

Policy makers are so caught up with wanting to see immediate results that they often fail to realize that such results may actually not mean much if one considers the big picture. Finally, short-term plans are faulty because they tend to stick to existing technology, instead of providing innovative ideas to carry out research and development.

Having said that, it is appropriate to consider some of the possible alternatives that can be incorporated in our policies in order to turn them into viable, workable solutions. It is important, however, to analyse the situation with a positive frame of mind. After all, it took the West more than 200 years to get acquainted with technology.

In fact, even Japan seriously began to pursue technological endeavours after the Meiji Restoration about 140 years ago. Compared to the above examples, our familiarity with modern science and technology is relatively recent and so it is hardly surprising that we are still wary of all that it has to offer.

This is not to say, of course, that we don't need to get our act together. If anything, we need to take a huge leap forward, skipping some of the conventional steps in this regard.

Here's how we can catch up: (1) shifting from agriculture to a knowledge-based economy; (2)

technology transfer should not only be oriented towards short-term creation of wealth, but also towards new visions to achieve competency in the long run.

Of course, all this is easier said than done. We cannot expect changes to appear without actually putting in the time, money and effort. In fact, both these alternatives require:

Human resource: When a country like Pakistan seeks to expand its economy, it must pool in on all its basic resources, which include skilled personnel. Without a competent, educated workforce, development cannot take place. This can be a real problem in a country where there seems to be a dearth of skilled people and so we need to: (a) revamp the high school education system; (b) change the technical education system to produce a skilled, educated workforce. This can be done with the help of community colleges, which besides providing general education, can produce manpower with skills in electronics, electrical techniques, plumbing, mechanics, medical techniques, computer programming, design, etc. This can be particularly helpful in a country like ours where degrees are considered to be a status symbol.

Community colleges will solve the problem by providing a bachelor's degree in two years. In fact, community colleges should replace sub-standard universities which do not provide quality graduate education. The policy document should mention the setting up of new community colleges, as well as converting many of existing colleges; (c) change the higher education system to produce talented and competitive engineers and scientists. China, India and Russia are doing that.

For example in India, Indian Institutes of Technology (IITs) are basically engineering institutes with very strong graduate schools in basic sciences. The result? Graduates with both ideas and skills. The policy document should mention targets for establishing such institutes, perhaps with foreign assistance just the way it was done in India. Innovation requires training at the highest possible level and this sort of training can be achieved through linkages with regional and international research centres, which is another thing that should be mentioned in the policy.

2. Technology for indigenous capabilities, particularly the convergence of computing, communication and wireless technologies. Once again, this poses a problem because we do not have the required plans to give rise to such convergence.

However, there are a few steps that can be taken to bring about this change: (a) commercially viable ventures in collaboration with companies in the West, which are known for outsourcing; (b) working with multinationals. In general, when the government issues contracts for its IT and telecommunication needs, it should stipulate that multinationals should establish research and development facilities in Pakistan as part of the contract.

Examples of this can be recent licensing of frequency bands to mobile companies. These cellular networks buy the required infrastructure from other multinational companies for setting up their mobile network with no technical development taking place in the country. This will only produce more consumers, and perhaps a technical support staff, but no technical know-how to break the cycle of consumer-oriented policies.

Developed countries take care of this problem by including minor changes that are different for different companies. This difference in standard gives the government control over technical details related to their infrastructure, as well as it forces MNCs to support their standards if they want to continue operating in the country. China has also started to follow this policy by offering its own standards in some areas of consumer electronics; (c) entrepreneurship. Here, academic science is required, because technology depends on the knowledge, training and culture that it provides.

Science develops new tools and software in laboratories and trains students and technicians to build them. These tools find uses outside and some young people become entrepreneurs and launch craft industries. In turn, these craft industries grow into big enterprises. This cycle is repeated over and over again and interestingly enough, it is scientific progress which makes it possible. However, such companies grow around centres of scientific research, for example, the Silicon Valley, which is found near Stanford University. But Third World countries do not such centres. So the question is do they still have a chance or is there no hope whatsoever for them anymore? While the answer may not be all that easy, one feels that a possible solution can be found in linkages with credible and established science centres in industrialized countries.

3. Promoting awareness. Since new technologies are being introduced all over the world at an alarming rate, it poses a challenge to a developing country like Pakistan. In order to bridge the ever increasing information gap between the North and the South, establishing a state-of-the-art information system, holding conferences, symposia and seminars in Pakistan on the latest technological breakthroughs, as well as the mobility of science and technology personnel are needed. This awareness is necessary since it is always easier to catch hold of a new technology when it is just starting out, instead of when it has been fully developed and is being modified frequently.

Investment in research and development. As mentioned earlier, both, research and development is the seed that gives way to products and services. Countries like Pakistan spend much more on agriculture, a 19th century industry, rather than investing in producing ideas for industries of the current century. Thus, spending on research and development is extremely essential.

Most industrialized countries spend anywhere between two to two-and-a-half per cent of the GNP

and 10 per cent of the budget on basic and applied research, whereas twice as much is spent on technology related to research and development. The rest is spent on creating infrastructure for research and training, along with overheads. In industrialized countries, the private sector contributes 60 per cent towards research and development, whereas the government contributes about 40 per cent.

On the other hand, in developing countries like Pakistan, most investors are not keen on spending money on research and development unless and until there is a promise of substantial financial returns. Thus, it falls on the government to invest in science and technology. Caution should, however, be observed, because we need to make sure our research and development enterprise is capable of absorbing the increase in a productive manner.

Finally, is it possible to take such a huge leap in a short period? Even though sceptics may not agree, it can happen. Some countries in East Asia, South Korea, Singapore, Malaysia, etc., managed to achieve this in one generation by using microchips and computer software, while some of the older albeit industrialized countries used coal and iron, causing themselves three generations of misery to prosper.

New technology makes the transition easier, for it is mobile. Also, it merely needs skilled human capital and not huge infrastructure and financial capital. The seemingly unattainable leap forward is possible, provided we as a nation have the will and our leaders are passionate about development.