

## PROBLEMS OF NATIONAL SELF-RELIANCE IN ELECTRONICS AND COMPUTERS

Achieving national self-reliance in Science and technology (S and T) has been a major theme of all our planning exercises since independence. It has almost become an unwritten covenant of justify every plan and policy by arguing that it will lead towards greater self-reliance. And it is undeniable that we have made certain headway in that director. The dispute is only over just *how far* we have managed to move towards self-reliance, how far we can *hope* to get in that direction, and what would be a *realistic* plan to work with and the disputes are often loud and bitter. There is hardly any major S and T venture announced (nuclear plants, satellites, rockets, computers almost anything) without an accompanying loud claim that it is wholly or mostly indigenous. And equally rare is the instance when such claims have not been openly and seriously challenged on the grounds that, in reality, very little of it is of truly indigenous origin. Between such claims and counter claims, the truth is invariably jettisoned.

We believe that this need not be so any more. As a nation we have quite come of age, and should have no fear in facing the truth about ourselves. We already have a few instances of such candid and bold statements about ourselves; first in the case of the education system as brought out in the document *The Challenge of Education* and then, to a lesser extent, in the case of the Abid Hussain Committee report on the CSIR. There is a need today for an open and candid discussion of our achievements and failures on the issue of national self-reliance in S and T matters. There is a need for a major restatement of the problem in the light of our past experiences as well as in the current international context. Beyond smugness or complacency and passion or rhetoric, there is a need for a statement of what is *possible* and how we plan to do it. While such an exercise is in fact necessary for our entire S and T scene, we believe a beginning can be made with Electronics and Computers.

The area of Electronics and Computers is, in many ways, unique and best suited to make a serious thrust towards national self-reliance. For one thing, it is a thoroughly modern enterprise and hence is free of many of the problems that afflict traditional industrial sectors of our economy. It is much easier to plan, formulate and implement policies and programmes in this sector. This is also an area where we have built up substantial competence and infrastructure. This area would perhaps have the highest percentage of bright young men and women, brimming with confidence, who are looking for challenging opportunities. It has also been recognized by the Government and other agencies that, in the information age that we are entering our performance in the area of Electronics and Computers is going to be of decisive importance caution has been sounded at the highest level that we, as a nation cannot afford to miss this bus also. It is also pointed out frequently that when small countries like South Korea and Taiwan are able to do so much in this area, we with our infrastructural facilities and skilled man-power should be able to achieve a lot more.

What exactly has been the extent to which self-reliance has been achieved in Electronics and Computers is a highly contentious issue. On the one hand we seem all poised to build our own super computers while on the other it is pointed out that even the PCs we make have hardly anything indigenous about it. It is revealing that after seeing an exhibition of the widest range of indigenous computers and related products arranged in Madras during the CSI-88 convention, the advisor to the Prime Minister on the Technology Missions was forthright in his opinion that he was not impressed at all. While we are believed to have advanced tremendously in mass communication areas like radio and television, we see every manufacturer flaunting a foreign collaboration agreement. While we have been actively working in the area of high frequency communications for many decades, most working systems are still having to be imported in toto. Even in the area of simple test and measuring equipments like oscilloscopes, the quality of what we produce seems so bad as to make every one (who can afford) try various ways (not all of them straight) of having them imported.

While none of the above is unknown to any of the four major actors on the stage, viz. the Government, the public sector, the private industry and the academic community, each seems to think that it is the

others who are responsible for it. While the Government thinks that each of the parties is out to defeat its well-intentioned measures for their own selfish interests, the rest are quite convinced that the major reason for this situation is the Governments lack of clear thinking, planning and implementation. The public sector does not at all see why it alone has to uphold the banner of indigenously, be supplied with third-rate stuff and ultimately be blamed for inefficiency, poor quality etc, while everyone else can have the best and the latest from abroad. As for the private industry, it lives in a fast changing world of stiff competition and high expectations and it cannot risk toying with ideas of self-reliance, patriotism and so on. And finally, the academic community is convinced that nobody has any real interest in harnessing its services to build national self-reliance, while everyone else seems to think that they (the academic community) are quite incapable of producing anything other than some fancy papers in some far-away fancy journals. This completes the circle, and while every one stands to gain from a major thrust towards national self-reliance, no one is sure as to who should bell the cat.

Our efforts today should be directed towards breaking this deadlock, and get some free and frank communication started between persons belonging to the Government, the public sector, the private industry and the academic community on the question of national self-reliance in Electronics and Computers. This idea is to have an uninhibited exchange of how each party perceives the issue. Since all parties concerned are committed to the idea, to varying degrees, that we have to strive towards increasing self-reliance, the major part of the discussion can only be on what are the major difficulties and problems, as perceived by each party, in realising this objective. For, there could indeed be serious problems; and some of them may even be insurmountable for the present.

It has to be understood that every foreign collaboration does not and should not necessarily mean a sell out to foreign interests and a surrender of national sovereignty. It is possible that, at least for the time being in some areas of Electronics and computers it may not be pragmatic and prudent to even attempt to be totally self-reliant. But then this has to be a conscious and spelt out decision. We must have the courage to spell out clearly that in such-and-such matters, we would continue to import technologies and /or products. Equally strongly should it be stated that every; protagonist of indigenous technology development and national self-reliance is not necessarily a threat to progress and modernisation, and a champion of backwardness and obsolescence. For, we as a nation have spent enough time in developing manpower and infrastructural capabilities and facilities (some sort of a probation periods with modern S and T) that we should now at least begin delivering and delivering fast. Our experience of the last four decades should be enough for us to make up our minds as to what parts we would do on our own and for what parts we would depend on others. The question of national self-reliance is not merely one of patriotism or national prestige, important as they are; it is also a question of efficient, viable and sustained utilization of our human and material resources, in addition to being also a matter of the dignity and creativity of an entire civilization.

The point is that, moving towards self-reliance in this area is likely to demand great discipline and sacrifice from all the parties involved. It is possible that we may have to, for the present, settle for things in Electronics and Computers that are not the latest (like a five-microm technology when the world is moving into sub-micron technologies). We may be accused of turning the clock backwards, etc. The important thing is to have an open acceptance of the fact that the road towards self-reliance is a thorny and hard one, and also that for us as a nation there is little choice in the matter. Another important dimension involved is that of the time-frame. It cannot any more be one of 20 or 30 years. We must, if we are serious at all about it, begin talking about self-reliance interms of 3 to 5 years.

As a first step, we should identify the basic issues and discuss them, say in a seminar. Our aim should be to arrive at a shared understanding of the problems involved and an outline of how and where we may possibly make some beginnings. We should have detailed reviews of our current state and prospects in various areas such as: (a) Components (b) Devices and ICs (c) Communications (d) Fibre Optics (e) Mini, Mainframe and super-computers (f) PCs (g) Test and Measuring instruments (h) Entertainment electronics (i) Control systems. Our first target should be to have a thorough review of the scene in each area, both nationally and internationally, bring out the level of indigenous

performance in that area, outline the major problems involved, propose what could be attempted in say the next 3 to 5 years and spell out the required steps to be taken as well as what would be demanded of each of the sectors involved.

Perhaps what we can hope for from such a discussion in a broad statement a statement, that could be a useful input to our planners and policy makers. Such a statement could also have a great educational value for the *S and T Community* as well as the public for it could be used to explain to them the real nature of the issues involved. It is indeed very useful to have a widespread appreciation of the very complex nature of the issue of national self-reliance in the present day context. But there is no reason why, through serious efforts, we cannot evolve some sort of a national consensus on this issue.

However, even more important would be our commitment to *work together* for indigenous development in the area of Electronics and Computers. May be we can work out a plan of what *we can do* in terms of our research and development, in terms of our participation in national bodies like Computer Society of India (CSI) and Institute of Electronics and Telecommunication Engineers (IETE) (for after-all these bodies should take up the effort of indigenous development as their main goal), and in terms of participation on various Government and Institutional Committees.

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