

Penyampai : TAN SRI DATO SERI AHMAD SARJI BIN ABDUL HAMID
Tajuk : "POLICY DIRECTIONS AND INSTITUTIONAL FRAMEWORK FOR ENHANCING THE
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1. Saya gembira menerima jemputan daripada Akademi Sains Malaysia untuk memberi ucapan mengenai sesuatu tajuk yang diberi perhatian serius oleh Kerajaan. Pada pagi ini saya akan cuba menggariskan usaha-usaha Kerajaan dalam bidang sains dan teknologi terutamanya di bawah Rancangan Malaysia Ketujuh. Selari dengan tema simposium ini saya juga akan menyentuh beberapa aspek yang akan merupakan asas dalam pembangunan sains dan teknologi pada amnya dan khususnya bagi penyelidikan dan pembangunan (ataupun R&D). Aspek-aspek ini akan merupakan 'operating principles' bagi mengawasi pelaksanaan program sains dan teknologi kita ke abad 21.

2. In the face of intense global competition, advances in technologies and changing consumer markets, Malaysia's industrial strategy will be reoriented. Industries will be encouraged to target for the global market and venture into large-scale operations to enjoy the benefits of economies of scale and thus lower unit costs of production.

Industries will be encouraged to move into high valued added, high-technology, skill-intensive as well as knowledge-intensive activities, as these are the wealth-creating areas of the future. The manufacture of capital and intermediate goods will be promoted as part of the efforts to broaden and deepen the manufacturing sector, as well as to reduce the reliance on imported components and equipment, thus reducing deficit in the BOP. New growth sectors such as aerospace, petrochemical, and IT industries will be promoted since the development of such industries will contribute to the build up of higher levels of technology and skills.

Investment in downstream activities of resource- based industries such as cocoa and food products, oleochemical, petrochemical, pulp and paper, rubber and wood products will continue to be encouraged in order to contribute towards higher value-added manufacturing. The development of SMIs, as strong supporting industries to larger enterprises, as well as export-oriented entities on their own merit, will be pursued more aggressively.

3. We must adopt a holistic approach to our S&T system in order to ensure that the fruits of our scientific enterprise are successfully transformed into productive uses. Indeed, consistent with the central themes of the Seventh Plan, the focus for S&T development during this Plan period will be to achieve the objectives of productivity driven growth and building national competitiveness. Greater emphasis will be accorded to increasing indigenous innovation capability and accelerating the strategic development of industrial technology. More attention will also be devoted to funding of R&D programmes that contribute towards development of 'reverse engineering' or technology adaptation capabilities as well as the development of technology applications that will enhance our quality of life. Besides supply side initiatives from the Government, the Seventh Plan also emphasises on strengthening the demand for, and capacity to use technology at the firm level.

4. In the twenty first century, comparative advantage will become much less a function of natural resource endowments and capital labour ratios, and much more a function of technology and skills. Mother nature and history will play a much smaller role, while human ingenuity will play a much bigger role. Simply put, comparative advantage will be man-made. Since man-made comparative advantage rests on technical knowledge and know-how, technology - and especially R&D - will become much more important. Thus the need to enhance the role of S&T in national development becomes all the more become critical.

5. What is critical now is for us to translate these policies and strategies into action plans and accelerate their implementation. S&T needs to make strategic and catalytic contributions, not merely to support but, to drive and promote our new technology- led industrial economy of the future. The use of locally generated technologies in the production process is not yet visible. It still lags behinds, indicating the

country's need to expedite the build up of indigenous capability in developing new and improved technologies for industry. As you are aware, the acquisition and diffusion of new technologies in the economy is mainly a result of increases in investment, particularly foreign direct investment (FDI).

6. Malaysia can keep on growing as long as it can utilise foreign technology. But having technology alone is not sufficient. We need the skills to make technology work. The issue of homegrown technological capability arises because collaborations and alliances with MNCs, including outright purchases of technology, can only be truly beneficial, especially for the long term, if there is some indigenous competence as well. Thus, the need to nurture and develop technical, design, engineering, and retooling skills as well as relevant R&D activities.

7. One of the development thrusts of the Seventh Plan is to maintain high growth with stability.

Real GDP is projected to grow at an average rate of 8.0% with a low rate of inflation. This target is expected to be achieved through effecting further structural transformation of the domestic economy.

Efforts will be made to increase the contribution from the services sector, continue to restructure the manufacturing sector, revamp agriculture and accelerate the robust growth of the construction sector. The demand for technology as a key ingredient in each of developments is well recognised.

8. At a strategic level, we must manage technology for growth. Research institutes, universities and the industry must strengthen their technology base in order to generate much more economic and social gains. An important way is to do this is by promoting R&D that will enable market-driven technological applications to be discovered, designed and implemented. As a result potential products and innovations will materialise for the market, powering the economy's growth even further.

9. For greater effect, there should be stronger cooperation in technology development between industry, the research institutes and universities.

Increasing emphasis will need to be placed on providing co-financing and joint programmes of research among these key players with a view to transforming research output into commercial and industrial applications.

10. The shift to higher value added and capital intensive industrialisation requires a massive technology push. Having experienced success in many industrial areas, from steel to the creation of a national automotive industry, and from telecommunications to microelectronics, Malaysia now offers a vast opportunity in the wide-ranging field of advanced technology. However, despite these impressive achievements, the foundation or national base of competitive assets, especially with regard to higher order skills and technology, is still not strong. This is thought provoking as it indicates that the country's overall good has been on the 'surface' of things, and performance and development in terms of 'depth' and 'breadth' is still missing.

This is attributed largely to structural weaknesses in industry, and dependence on imported technologies and expertise. This implies that even at a higher level of economic development, we may still not have technologies, innovations and intellectual property that we can call our own unless we undertake more drastic measures. Underscoring this, is the issue of the extent of transfer of technology from abroad, and subsequent dissemination and diffusion within local industry.

11. This is a critical area where you can make a difference. Scientists, technologists, researchers, educationists and engineers, together with the private sector, need to search out for ways that the country can use to increase local technical content, and promote an education and training system that will create a world class, technologically-fluent workforce not only for purposes of technology transfer from abroad but also for generating new and emerging technologies. A stronger technology and knowledge-based infrastructure and manpower will pave the way for smoother and faster industrial transformation.

12. Malaysia is currently a consumer of technology.

The goal is also for the country to become a contributor of innovation and technology which have world-wide application. For this to happen, we need to generate homegrown technology with original brands of goods and services that can be marketed globally.

13. The Malaysian R&D system, particularly that of the public sector excels in making technical discoveries and inventing new products. However, related downstream activities such as product design and improved manufacturing processes have not received adequate attention. Thus, attention must be given not only to current and future R&D and technological development needs but also prospects on commercialisation of research findings and transfer of technology to local industry. The situation gives rise to issues as to how best and how fast can the commercialisation of technology from laboratory to the market take place. We have come to a stage of development where we should be able to undertake special projects to innovate, design, produce and market original Malaysian products, process, and services. And that too with a high local content.

14. On the other hand, the local private sector is not undertaking sufficient product and process reengineering and innovation. Malaysian firms tend to regard R&D expenditure as a cost rather than an integral part of total investment. The preference is for tested and tried technologies through various means such as licensing and joint-ventures with foreign entities, rather than develop original or own brands of products and processes. In addition, the take-up rate of the various fiscal and financial incentives aimed at increasing local R&D has been lower than expected. While in the medium term the country can depend on imported technology, however, for the longer term industry leaders must view technology as one of the key foundations of the next generation economy. The private sector must be challenged to take on bold initiatives in technology advancement and seek new investment and business opportunities that will benefit the firm, and the nation as well.

15. The Government will increase investment in scientific and technological education and training with the aim of developing a critical mass of scientists, engineers and researchers required by the nation. A total of RM2.0 billion has been committed, including RM300 million for training of R&D personnel. In addition, measures are being mooted to foster creativity and innovativeness in the young and raising the general S&T interested and awareness levels. While institutions of higher learning will focus on ensuring the appropriate formal education and instruction, the private sector is expected to equip the workforce with the requisite training at the practical level -through new training, upgrading and retraining. For the future, there is no choice. We must focus on having a techno-literate population and workforce. Here we don't mean just the hard academic sciences but literacy that will improve the way and quality of life of Malaysians. As the nation moves towards 2020, developments in S&T will continue to give rise to a digital economy, and revolutionary innovations, that will change our lives. Greater S&T originated products and services will see Malaysians tapping into a vast mass of remote controlled innovations and electronically generated and stored information and services which they can use to their best ends - to improve business, to make work easier and to enhance personal and social lives. Such developments are envisioned to have enormous impact on our lives -in fact it will alter the way we live or rather the way we go about living in the coming decades.

16. Over the last couple of years, it has become evident that the public sector, including R&D agencies and universities, needs to be more flexible and make the necessary adjustments to deal with increasingly complex demands arising from the enhanced role of the private sector in national development, as well as the internationalisation of our economy. The country has taken on a proactive stance by encouraging public agencies to go 'commercial' and become market-oriented. In view of this, the traditional way of doing many things in the public sector is not feasible anymore, if not altogether inapplicable. In this regard, research and technology-based agencies too will need to find innovative ways of internalising these shifts in policy perspectives and approaches.

17. In the area of S&T, in particular, the Government is promoting the adoption of a contract research system in public sector research institutions and universities. This is in line with the objectives to transform these entities into contract research organisations and to achieve the 65 per cent self-financing target by the year 2000.

The establishment of a contract research system will require a significant change in the way R&D organizations are being managed. It would require comprehensive reevaluation of their management system, strategies, organizational structures and the way R&D activities are being selected and funded. In essence, the research institutions as well as the consultancy units in universities are to take on a commercial orientation. Guidelines have been prepared to gradually steer research institutions towards this direction, and ensure that organizational infrastructure in public sector agencies undertaking R&D is in line with the demand and technological changes taking place in the economy.

18. As part of the national efforts to enhance the effectiveness and efficiency of public sector organizations, the Government initiated the corporatization of a number of research-related institutions. Currently, the Standards and Industrial Research Institute of Malaysia (SIRIM), Malaysian Institute of Microelectronics System (MIMOS) and TPM are undergoing corporatization to meet R&D challenges posed by the commercial world.

With this restructuring, research organizations are expected to be better equipped to provide R&D services to the private sector and assist selected industries to undertake innovations as well as new product and process development.

19. MPKSN has instituted several changes to the IRPA Programme commencing this year in order to ensure that the public sector research efforts are more focused and results-oriented. Considerable modifications were made to the scope, procedures and institutional arrangements governing the IRPA funding administration. These changes represent a considerable departure from the groundrules that have characterised the old IRPA. Changes of such magnitude are obviously not without hiccups. MPKSN has recognised some of these shortcomings and has recently approved a Users' Manual on the IRPA Programme which details measures to address some of these deficiencies. This first ever Manual provides a comprehensive framework on the management of the IRPA programme and aims to ensure that the programme is more transparent and systematic. The success of this Manual and, more crucially, our entire public research programme is determined by how well we manage the research effort at the institutional level. I wish to belabour on this point since it is management at this level who are conversant with the appropriateness of the projects proposed for funding as well as the suitability of the project team. No amount of detailed elaboration by the Users' Manual, that I have just mentioned, can ever replace the leadership displayed by management in ensuring that projects selected are aligned with the organisation's expectations; are addressed to meet end-users' expectations; and ensure that researchers' expectations are satisfied. Meeting this trinity of expectations places a premium on institutional leadership. I am confident that given commitment and leadership, our public sector research efforts can contribute significantly to the growth and expansion of our economy.

20. We must not get carried away with our fascination with technology and be blinded to our social responsibilities. In our rigorous efforts to innovate, and manage technology for growth and development, due regard must be given to environmental considerations as well as transfer of know-how, skills and training to the general workforce. In addition, S&T must also lead the way to greater distribution of wealth, perpetuate harmony, peace and prosperity so that our children and future generations will inherit a better world.

21. On that note, I would like to say that as Chairman of the National Council for Scientific Research and Development, I look forward to receiving the results of your deliberations and recommendations.