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sustaining income growth. This consideration is particularly pertinent to Penang, given its limited natural resources but strong foundation in knowledge-based human resources.

A degraded natural environment is especially devastating for the poor, who generally have little human capital and continue to depend on natural capital (soils, natural water sources, fisheries) for their incomes. Because the poor have few possibilities for substituting other assets for natural resources, the degradation of those resources could lead to irreversible vicious circles of poverty and environmental destruction. Although this group may form only a minority in the Penang population, it is necessary to pay attention to their needs to ensure that they are not marginalised further.

A re-examination of where government support and subsidies should be focused may be timely. Evidence accumulated over the last decade by the World Bank indicates that government subsidies to industries, agriculture, and infrastructure worldwide are huge. By and large, government subsidies to industries have a moderate impact on firm's investment and growth in the first year, but over the medium run have little effect on growth. Capital subsidies also seem to induce a negative effect on total factor productivity of the industries that receive subsidies.

Corporate subsidies are inappropriate if increasing national income and productivity is the goal. Capital subsidization induced efficiency losses ranging from 5 to 15 percent. The subsidies were basically incorporated into profits or rents, as the subsidised firms earned higher rates of return than those that were not subsidized. Capital subsidies could only offer a temporary relief to decreasing rates of economic growth associated with distorted asset growth. Investing a greater part of national savings in the expansion of human and social assets - and the sustainable use of natural assets - could contribute to more growth and better growth in the long run.

#### *Improving Distribution of Opportunities*

The focus on quality brings to light the importance of distributional aspects to the growth process. A more equitable distribution of human capital, land, and other productive assets implies a more equitable distribution of earning opportunities, enhancing people's capacity to take advantage of technologies and to generate incomes. That is why a given growth rate is likely to be associated with better poverty outcomes in settings where educational opportunities are distributed more equitably. In this regard, Penang's performance is laudable in quantitative terms with a literacy rate of more than 95 percent and secondary school participation rate of about 61 percent. The area that bears scrutiny is the quality of this education and the extent to which they match employment or income generation needs.

Besides education, supportive labour market policies and social protection policies are also needed. Urban unskilled workers are most vulnerable to external shocks, structural adjustments, and economic downturns. Lacking adequate human capital, they are often unable to adjust to changes in the labour market demand. The government needs to help build labour market institutions and provide the labour market information that the poor need. There is also the need to train or retrain displaced workers and increase their mobility across sectors. A good model to follow is Ghana which trained more than 4,000 people in vocational schools or apprentice programmes that offered instructions in such skills as dressmaking, electrification, and carpentry. Participants received certificates and tools after completing the training, giving them the human and physical capital to begin work immediately as self-employed workers.

#### *Sustaining Natural Capital*

Environmental degradation has worsened sharply worldwide. Contributing factors include population growth, domestic and global pressures on scarce resources as well as economic policies, for example, subsidies that ignore environmental consequences. The costs of environmental pollution and resource over-exploitation are enormous; the losses in many cases are irreversible. Few countries have adequately confronted the underlying causes of environmental and resource degradation - the policy distortions, market failures, as well as lack of knowledge about the full benefits of environmental protection and resource conservation.

Neither rapid nor slow growth is an automatic ally of natural capital. However, fast growth, with increasing urbanisation, industrial expansion, and exploitation of renewable and non-renewable resources, places pressures on the environment such that many indicators show a decline in the quality of natural capital during growth periods.

Environmentalists have come up with a variety of innovations to limit the ecological costs of growth. Green taxes can be particularly useful in managing emissions that contribute to air and water pollution. Taxing the use of coal by industry or the use of gasoline in motor vehicles will reduce excessive resource use and emissions and raise tax reve-

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nues; thus green taxes can provide a win-win approach to managing environmental quality with growth. Pollution taxes are most efficient when a well-established regulatory framework with emissions norms and an efficient system of monitoring and enforcement are in place. Effective green taxes also encourage the use of cleaner energy sources, such as solar power.

A switch from income to consumption taxes can also benefit the environment and growth. The production and consumption of luxury goods often make heavy demands on environmental and natural resources. Consumption taxes can curb the over-exploitation of these goods. Progressive consumption taxes also promote equity, and by encouraging savings, they promote economic growth. Measurements of "green gross national product" and genuine savings are also gaining prominence as a way to incorporate sustainability into traditional economic planning.

#### *Dealing with Global Financial Risks*

Global financial integration has undeniable benefits for developing and industrial countries, but also exposes countries to the vicissitudes of international capital markets, such as volatility in currency values, interest rates, liquidity, and volumes of capital flows, with important macro-economic and growth consequences. These risks are pronounced and costly, as demonstrated recently by lost output and jobs, corporate and banking distress, and increased poverty in countries hit by the Asian Financial Crisis, especially in countries where the institutional and regulatory frameworks for open capital markets are not fully in place.

Stability in growth outcomes over time is essential as the incomes of the poor can be very sensitive to cycles and crises, especially because the poor lack assets - land, skills, and financial savings - to smooth their consumption in bad times. Living barely above the poverty line, millions of near-poor have been thrown back into poverty by external shocks. So for growth to reduce poverty, it usually needs to be relatively stable, and its benefits need to be widely spread.

#### *Improving Governance*

The institutional structures of good governance underpin everything done to boost growth. The effective functioning of bureaucracies, regulatory frameworks, civil liberties, and transparent and accountable institutions for ensuring the rule of law and participation matters for growth and development. The effects of poor governance, bureaucratic harassment, and corruption are regressive and harmful to sustained growth.

A vibrant civil society - empowered by Internet computing tools, diagnostic survey techniques, and the latest information on governance - is indispensable in the fight against corruption and other forms of misgovernance. Civil liberties are not only linked positively to improved governance, reduced corruption, and increased productivity of public investments, but they also contribute to welfare directly. Indeed, attention ought to go beyond getting the government side of the equation right. It also needs to go to enhancing civil rights and giving greater voice to diverse groups, promoting competitive enterprises, and complementing top-down government policy reforms with bottom-up formulation and implementation of development strategies.

A comprehensive development framework requires a qualitative and fuller agenda involving structural, human, social, and environmental aspects of the growth process. This broader focus complements liberalization with a build-up in the assets and capabilities of the poor. It shifts attention from an exclusive reliance on government as the agent of change to the engagement of all parts of society. And it requires much more effective capacity building across the board.

With all development partners complementing one another, a more integrated framework can be implemented more effectively. First, the large inequalities in opportunities if addressed now, present the greatest promise for welfare gains to society. Second, the environmental damage and biodiversity losses from current growth patterns are frightening, but if they are addressed now, growth can achieve a better natural environment and reduce the number of poor. Third, globalization presents risks to the poor, but if those risks are addressed now, globalization could make possible the technological wherewithal for reducing poverty. Fourth, corruption, misgovernance, and lack of civil liberties and voice threaten the gains from any action, but if those threats are addressed now, better governance presents great promise of improved welfare.

The opportunities afforded by increased openness, knowledge, and technologies are plentiful. Equally, the challenges of poverty, population growth, environmental degradation, financial distress, and misgovernance have never been greater. What is needed is more growth with a focus on quality. This is not a luxury. ***§ Tan Pek Leng***



## Human Resource: Issues & Challenges, Prospects For Growth (Part One)

### *Introduction*

Human resource is the key issue for many developing as well as developed countries. Its availability, whether skilled or unskilled is a determining factor for the inflow of foreign direct investments (FDIs) to many developing nations. Human resource is also an important factor in determining the competitiveness of individual companies as well as a requirement for developing industrial clusters.

Penang depended on its abundant supply of literate and trainable labour force to attract investments in the export-oriented electronics industry since the early '70s. This labour force has gone through skills upgrading and enhancement in the past three decades and today, Penang can boast of having a pool of relatively skilled and professional labour force that is capable of handling and developing state-of-the-art technologies. Penang has been identified as the top region for the electronics industry in Malaysia<sup>1</sup> and is also well known as the Silicon Island of the East. Despite these accomplishments, human resource, which was and remains the key factor in driving Penang's economic growth, continues to be a development issue in Penang.

### *Issues & Challenges*

#### Issues

The human resource issues discussed in this article mainly refer to the issues encountered by manufacturing establishments in Penang. These issues are more pertinent to Penang because the manufacturing sector is the largest contributor to the Penang economy, accounting for 46 per cent of the State's GDP in 2000. Six major issues have been identified as follows:

#### *(i) Shortage of Skilled Personnel*

Although Penang has been identified as the top region for the electronics industry in Malaysia and is also commonly referred to as the Silicon Island, the State still lacks the skills base that builds up a silicon island. This refers to design and research & development (R&D) capabilities. As such, Penang is still very much a manufacturing and assembly hub rather than a high-tech island.

This issue is mainly attributed to the shortages of software engineers, which is a skill area that is very crucial for the development of information and communication technologies (ICT) and other high-tech industries and activities. In the past five years (1996-2000), Malaysian universities only produced about 5,360 graduates in physics, engineering and information technology related courses.<sup>2</sup> On the contrary, these skills are widely available in the newly emerging economies like India and China that are competing very aggressively with Penang, and Malaysia in general, for FDIs in high-tech areas that are anticipated to contribute to further transfer of technology and know-how to the local labour force. These two newly emerging economies are also producing more graduates in such skill areas as well as providing a larger market base for the FDIs compared with Malaysia, which has a small population base. As for Malaysia, the five key science & technology universities<sup>3</sup> are expected to produce only an additional 12,000<sup>4</sup> graduates in these fields in the next five years.

The Malaysian Government made the right move by shifting towards k-economy, especially in keeping pace with the other developed nations. However, adopting the shift towards k-economy also means that more information technology (IT) personnel will be required. It is estimated that by the end of 2000, additional 15,000<sup>5</sup> IT personnel were required but this demand could not be fulfilled by the existing supply of engineers and IT graduates as discussed earlier. In addition, Malaysia would also encounter stiff competition from the developed countries like the US<sup>6</sup> and also with other countries in this region in attracting qualified IT personnel. Table 1 shows the demand for IT personnel in selected countries. This competition is the first shot of a battle for 'brains' that may determine the winners and losers in the new economic era and the first signs of decelerating growth will be measured by relative decline in productivity and competitiveness.

The manufacturing establishments are also facing shortages of engineers, especially those in the fields of electronics, mechatronics and software. This is partly due to a mismatch between the supply and demand of workers. There is a surplus of civil engineers, town planners as well as graduates of arts-related and business administration

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degrees while the manufacturing establishments are facing shortages of engineers. This indicates a lack of coordination between the institutes of high learning and the industries. The institutes of higher learning are still producing in mass quantity graduates of business and arts-related courses while the industries are asking for more graduates in engineering and technical courses, at either degree, diploma or certificate levels. Furthermore, parents are still keen on encouraging their children to complete their formal education up to the A-level and then to pursue their tertiary education in business or arts-related courses in private colleges even though their children are not academically inclined. The perception is that if their children hold white-collar jobs, it is better than blue-collar ones. As such, there is a surplus of non-technical labour force while shortages also occur at the technician levels. This surplus labour could very well be trained as technicians right after their secondary education without the trouble of going through tertiary education in business and arts-related courses. As technicians, they could be trained and upgraded as assistant engineers and eventually engineers. As a result of the surplus of business and arts-related graduates and the scarcity of science & technology (S&T) graduates, the issues of labour mismatch, shortages and unemployment are further aggravated.

*Table 1: Requirement For IT Personnel In Selected Countries*

Country	No of IT Personnel Required	Time Frame
Malaysia	15,000	End 2000
Korea	50,000	2002
Hong Kong	17,000	2005
India	2,200,000	2008
Thailand	800,000	2015

Source: FEER, 9 November 2000

It should be noted that other than the electronics industry, other industries that play supporting and ancillary roles to the electronics industry are equally important. These industries also encounter problems of shortages of skilled workers. Plastic injection moulding companies, in particular, do not only lose their workers to the electronics companies due to their less attractive remuneration packages, but are also unable to recruit engineers that possess the relevant skills. The universities and institutes of higher learning are not offering courses that fulfil the entire requirement of the plastics companies. For example, the polymer science course that is being offered by the USM equips the students with knowledge on the materials but not the moulds, machinery and process as required by the plastics companies.

There is also a general shortage of mould designers and makers. When Malaysia began to promote export-oriented industrialisation, the government missed out on the promotion of mould and die industry. As such, Malaysia does not produce a sufficient supply of mould designers and makers. Most of the moulds used in production are being imported while some companies have taken the initiative to design and make the moulds locally. However, to meet their production requirements, companies in the mould and die industry, have to import their workers from abroad. Despite these shortages, the government has not been very supportive in the approval of work permits for foreign experts. There were cases of applications being rejected without reasons. Table 2 summarises additional requirement for engineers, IT-related professionals, technicians and mould & die makers in 2000 and 2001.

To further support this claim, a recent short survey of 12 firms by SERI shows that 75 per cent of the respondents indicated that they had to bring in foreign expertise into Penang because local expertise was not available. These companies brought in a total of 101 foreign experts from countries like India and US during the past 5 years. These foreign experts include the following: experienced technical experts, senior management staff, software experts, experts in optical components and communication technology, experts in IT applications, experts in service

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operations, direct sales directors, marketing directors, online sales and marketing experts, business development managers, R&D scientists, as well as design engineers.

Table 2: Additional Requirement For Manpower

	2000	2001
Electronics Engineers	361	372
Mechanical Engineers	299	240
Industrial Engineers	79	71
Chemical Engineers	31	27
QC Engineers	145	149
Engineers (others)	103	90
System Analysts	86	94
Computer Programmers	39	41
Technicians	1151	1168
Tool & Die Makers	62	74

Source: Derived from PDC Industrial Survey, 1999

(ii) *Shortage of Highly Qualified People*

There is an acute shortage of highly qualified personnel. In the past, the MNCs had to bring in foreign experts to manage their local operations. Today, many of the MNCs, particularly those from the US have appointed local CEOs and managers to manage their local operations. However, local expertise at this level, namely the top one per cent of the hierarchy in the corporation, is still scarce. It cannot be denied that there are many qualified Malaysians to hold such positions. However, many of them are currently stationed overseas serving the large corporations in developed nations. These Malaysians are either involved in the management positions or in R&D activities or they are specialists in the various skill areas such as biotechnology, information technology, software development, physics, etc.

Some of these Malaysians may wish to return and serve in Malaysia, but there are other impediments that discourage them from doing so. The incentives proposed by the government during the 2001 budget is a positive stance taken by the government to encourage the return of skilled and professional Malaysians. However, the impediments that are discouraging these Malaysians from returning are more than just the permanent residence status and duty free repatriation of possessions from abroad that the government had promised to grant. These disincentives include the career prospects of these Malaysians, the education and healthcare provisions for their families, the social and cultural environment, as well as the overall quality of life in Malaysia.

(iii) *Lack of Entrepreneurial Expertise*

As more companies are moving up the value chain, companies are expanding their activities from their traditional assembly and test operations to include design, R&D, distribution as well as sales and marketing. Such moves towards higher value-added activities require not only technical capabilities but also entrepreneurial and management capabilities. Nevertheless, the existing labour force is not able to keep pace with the enthusiasm of the industries to develop towards this end.

Companies that are adopting the Manufacturing++ concept, particularly those that are extending their activities towards distribution, sales and marketing are unable to recruit personnel who are equipped with all the requisites required because they lack managerial and entrepreneurial expertise although they possess technical skills. The lack of managerial and entrepreneurial expertise is also partly attributed to the lack of training institutes that pro-

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vide a good combination of technical and managerial courses. The low hiring rate<sup>7</sup> by MNCs, particularly those that implement the Manufacturing++ concept indicates that the job seekers are unable to meet the MNCs' requirements. As such, the availability of good technical-cum-business schools/colleges would not only produce graduates with entrepreneurial and management skills but also with capabilities to build and fine-tune the systems to provide solutions for the future.

(iv) *Bureaucratic Bottlenecks*

The government has been very pro-active in its efforts to facilitate investors by having excellent policies and strategies that offer various programmes and incentive packages to attract and retain investors. Despite these efforts, investors and industrialists still encounter problems and challenges because bottlenecks still persist at the implementation levels. The application process for permits is still rather tedious and time consuming.

In addition, the present immigration regulations do not favour the in-migration of experts from the less developed countries. The restrictions as well as the duration of work permits for these experts serve as a factor that discourages the experts from coming to Malaysia.

(v) *Brain Drain*

The issue of brain drain is getting crucial. While Malaysians who have migrated long ago are rather reluctant to return, the younger generation, particularly those who have and are going to pursue their studies overseas are increasingly planning not to return. These Malaysians chose not to return because of better and more challenging job and educational opportunities overseas. Likewise, Malaysians with foreign spouses and children are reluctant to return because they face difficulties in adjusting to the Malaysian school system and environment, social and cultural practices and the general living environment. The expectations of these Malaysians are also higher and may not be able to adapt to lifestyles in Malaysia after being abroad for many years.

Brain drain is not only attributed to the decisions made by Malaysians who have migrated abroad. The MNCs/LSIs are also responsible for the brain drain. LSIs/MNCs normally invest offshore to reap profits through the comparative advantages of the locations. Their employees are transferable within their offshore plants. While employees who are sent abroad by the MNCs/LSIs would normally return and serve in Malaysia, there are also possibilities that they would choose to extend their stint abroad for a longer duration, which eventually leads to permanent residence there. The experts/specialists would most likely continue their overseas stint and not return to Malaysia because they find their jobs more challenging there.

(vi) *Shortage of Production Workers*

Unlike the skills requirement by electronics and ICT related industries that are progressively advancing, there are still several industries in Penang with technologies and processes that have remained the same or where changes are nominal. These mainly comprise domestic-oriented industries as well as the apparel industry. Many of these industries are also still labour-intensive and not withstanding the usage of machinery and equipment, these companies continue to face shortages of workers at the production level. Although many of these companies have automated some of their production processes, there are also incidences when the companies could not justify their needs to invest in certain machinery and equipment due to their exorbitant costs. The required machinery and equipment are not available locally and thus need to be imported. The pegging of the Ringgit at 3.8 to a US dollar, though has enhanced the competitiveness of exporters, has increased the cost of operation of the importers of machinery and equipment. A recent survey by the Penang Development Corporation estimated that additional 17,833 production workers were required in 2000 and another 8,311 production workers will be required in 2001.<sup>8</sup> The vast number of workers at the production level indicates that the manufacturing sector in Penang, in general, is still relatively low value-added and there is a need for these manufacturers to upgrade their facilities to manufacture higher-end products and to relocate the labour-intensive part of their production to lower cost locations.

Challenges

The greatest challenge to Penang would be when AFTA (Asean Free Trade Area) and WTO (World Trade Organisation) come into effect. This is when local policy will be increasingly determined by global forces, thus, resulting in smaller economies losing out, as they will be increasingly unable to affect global forces under the influence

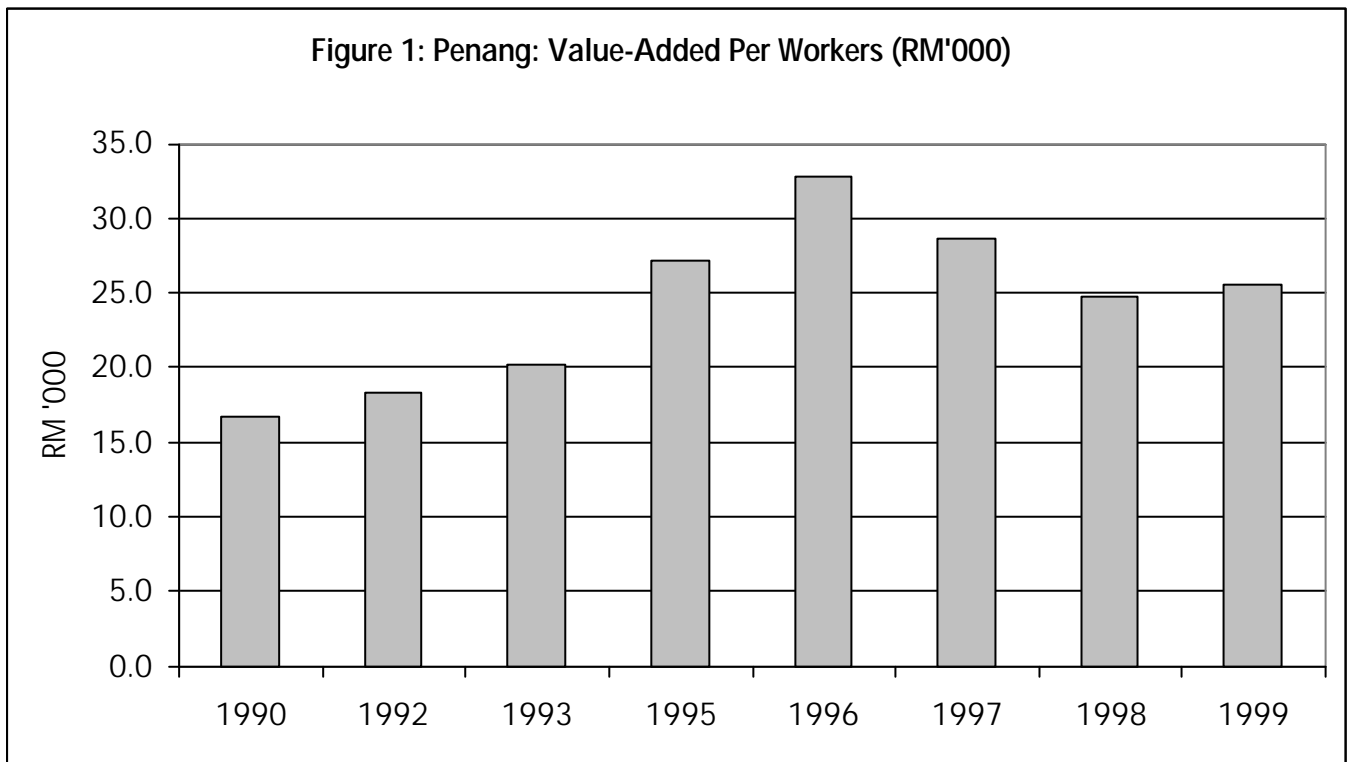
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of larger economies.<sup>9</sup>

The rising cost of production and declining productivity have and will prompt more firms, whether local or foreign to relocate to lower cost locations like Thailand and Indonesia. Productivity as represented by value-added per worker in Penang peaked in 1996 and has been declining since then (Figure 1).

In a recent survey by SERI, 36 per cent of the respondents indicated that they would probably relocate some parts of their operation outside Malaysia and 30 per cent of them outside Penang, with the onset of AFTA in 2003. This implies that Penang will lose out to the neighbouring countries if the industries, including the supporting and ancillary industry starts to move out. This is mainly because the supporting and ancillary industry is an important determining factor for competitiveness and industrial cluster development. As such human resource development would play a more crucial role now in retaining the existing investments as well as attracting new ones because Penang can no longer be promoted as a low cost location. Other attributes for building competitiveness and cluster development, such as the provision of adequate and quality infrastructure, should be looked into to sustain economic growth.



Source: Calculated from SERI' GDP figures and DOS Employment Data

Endnotes:

1. Second Industrial Master Plan, 1996-2005.
2. Derived from Prof. Dr. Harith Ahmad, "Photonics Research in Malaysia", PSDC Forum on *Viability of Photonics Components Manufacturing in Malaysia*, January 2001.
3. USM, UKM, MMU, MU, UTM
4. Derived from Prof. Dr. Harith, "Photonics Research in Malaysia", PSDC Forum on *Viability of Photonics Components Manufacturing in Malaysia*, January 2001.
5. FEER, 9 November 2000
6. The Congress in US has recently passed a bill to expand its quota for imported labour, particularly those with IT skills.
7. Around 10 per cent.
8. PDC Industrial Survey, 1999.
9. Terence Too, "Globalisation, WTO & AFTA: A Commentary", *Economic Briefing to Penang State Government*, January 2001