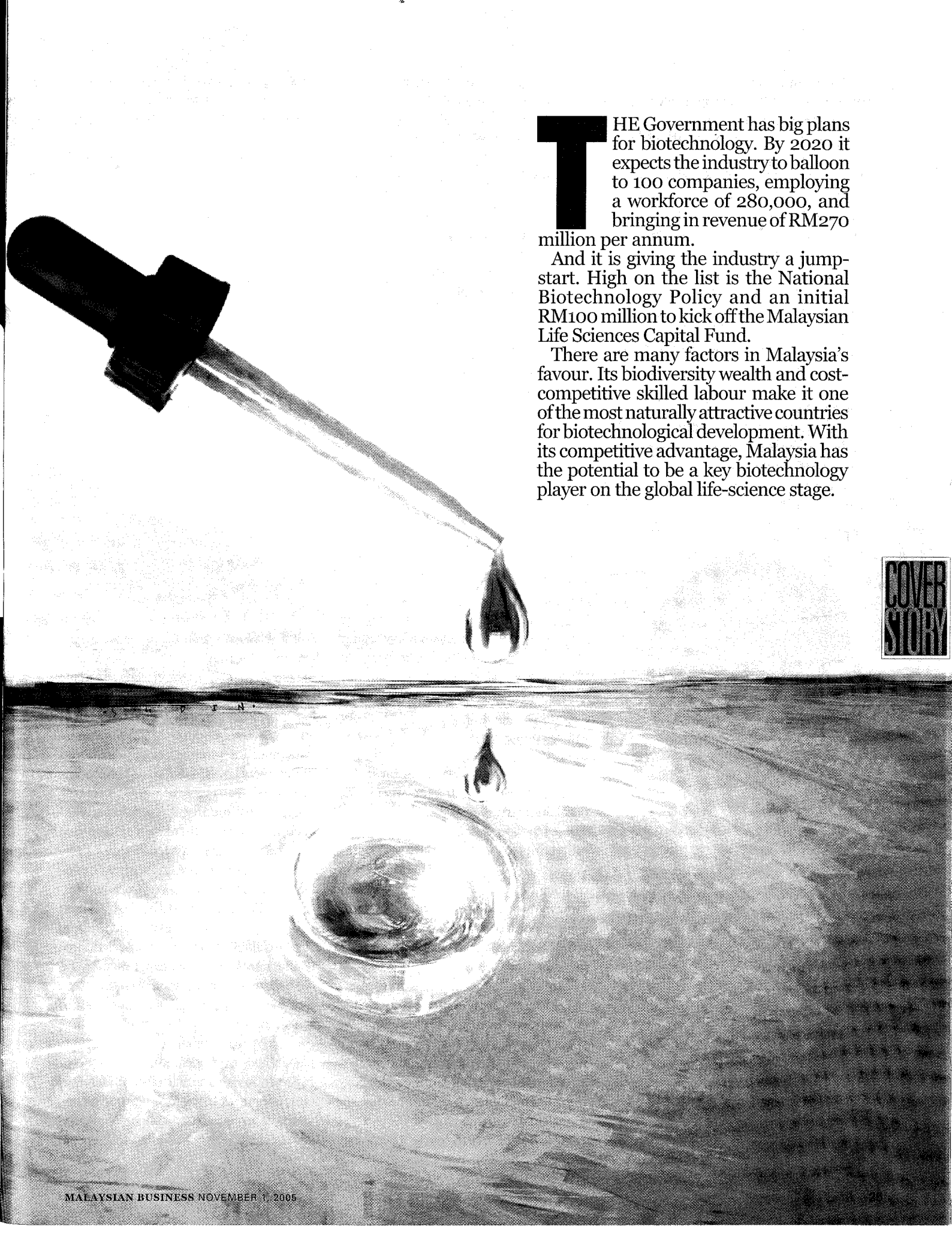
Continuing the Biotech Challenge

After the doubtful status of the much touted BioValley project, Malaysia is giving it another shot at creating a biotechnology industry with BioNexus. Will it fare better this time? Stories by Clarence Y K Ngui



THE Government has big plans for biotechnology. By 2020 it expects the industry to balloon to 100 companies, employing a workforce of 280,000, and bringing in revenue of RM270 million per annum.

And it is giving the industry a jump-start. High on the list is the National Biotechnology Policy and an initial RM100 million to kick off the Malaysian Life Sciences Capital Fund.

There are many factors in Malaysia's favour. Its biodiversity wealth and cost-competitive skilled labour make it one of the most naturally attractive countries for biotechnological development. With its competitive advantage, Malaysia has the potential to be a key biotechnology player on the global life-science stage.

COVER STORY

But the future also very much depends on the past. After nearly a decade of development, the biotechnology dream remains in danger of being all hype. A biotechnology proponent says there are few significant biotech foreign investments in Malaysia. Depending on who you talk to, the biotechnology initiative in Malaysia is either 'a very good move', underdeveloped, or virtually non-existent.

Case in point: What happened to the grand RM580 million BioValley project mooted a few years ago? These days, Prime Minister Datuk Seri Abdullah Ahmad Badawi's National Biotechnology Policy (NBP) promotes much simpler ideas.

'A key guiding principle is to maximise the country's naturally endowed resources and existing strength,' Abdullah said. Indeed, there is now less talk of gleaming new biotechnology parks. Instead, the emphasis is on capitalising on current research facilities.

COVER STORY

Iskandar: *Our objective is to undertake wealth creation and promote social well-being*

'There are immense prospects for the country,' says Malaysian Biotechnology Corporation Sdn Bhd's (MBC) chief executive officer Iskandar Mizal Mahmood. The MBC was set up, along with the NBP's formulation, in April 2005 to coordinate biotech initiatives from relevant government ministries in Malaysia. Among others, MBC would catalyse commercial spin-offs to the private sector and facilitate market-driven research and development and commerce via funding and industry development.

There are immense prospects for the country. – Iskandar

Can the NBP put Malaysia on the global biotechnology map? After six months, just what are the positive changes to the sector?

'It is unfair to take stock now,' says Iskandar. 'It takes more than six months to see positive results.'

THE MALAYSIAN APPROACH

'Our objective is to undertake wealth creation and promote social well-being,' says Iskandar. He believes the development of the biotechnology sector must create opportunities that can benefit ordinary Malaysians. 'It has to be in a way suitable for all Malaysians,' he says.

Perhaps that's the best approach for Malaysians, but can this attract top biotechnology companies to Malaysia? Iskandar says he is working on it. 'At MBC, we are looking into the exact needs of the industry,' he says.

But why are there hardly any foreign biotechnology company in Malaysia? Worse still, why are even Malaysian companies less-than-willing to share their views on the biotechnology sector, especially their experiences in the early years? In fact, many declined our requests for interview.

'Malaysia lags behind some of its neighbours. But, given the strong commitment from the Government, we should be able to bridge the gap. What we need is strategic planning and proper direction,' says Malaysian Biotechnology Information Centre programme director Mahaletchumy Arujanan.

Mardi's deputy director (Biotechnology Research Centre), Dr Umi Kalsom Abu Bakar, concurs. 'Proper policy, clear direction, sound implementation, infrastructure and critical mass, and sufficiently trained human resources are needed to meet the requirements along the value chain of each biotech product, from R&D right through commercialisation,' she says.

Umi believes that since Malaysia is essentially an agricultural country, agricultural biotech can be the right focus as biotechnological tools can be specifically applied to the different facets of agricultural activities already existing in the country.

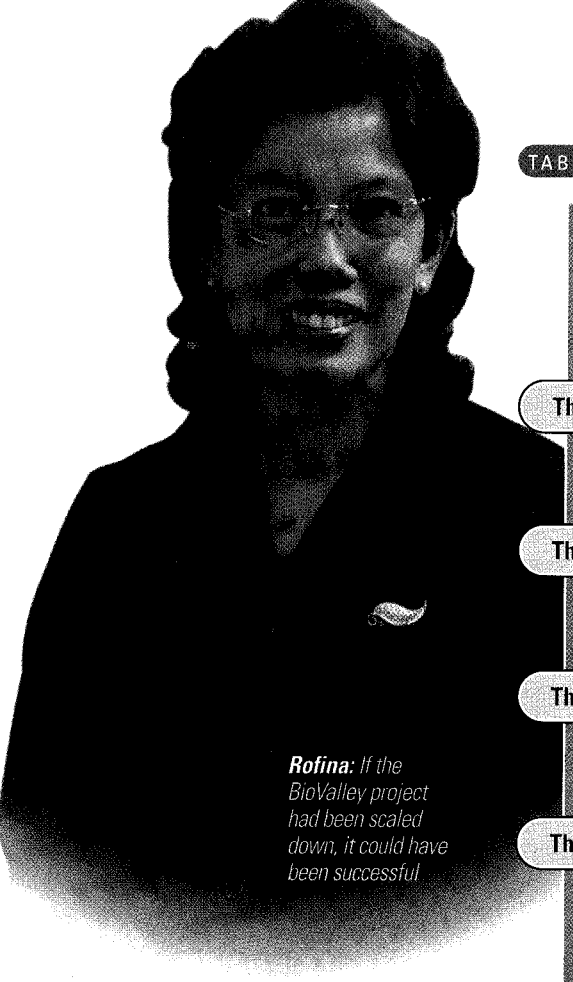
Mahaletchumy says it is till not too late for Malaysia as the nation still has the competitive advantage in its rich biodiversity and strong agricultural base. 'We have many commodity crops that we could work on to improve yield and quality,' she says *(see box story on page 28 on Malaysia's agri-biotechnology).*

ANOTHER BIOVALLEY?

Even with the NBP, there are still fears that the biotechnology sector in Malaysia may turn out to be vast industrial parks with towering buildings, shiny new laboratories and little else. Perhaps Malaysians still remember the promises of the BioValley project, which was launched in May 2003. Today, all that is left of the 80-hectare project designed by famed Japanese architect Kisho Kurokawa is a large construction site with a few buildings.

'It was one of the most grandiose biotechnology projects. We were hoping that BioValley would take off,' says University of Malaya head of Centre for Research in Biotechnology for Agriculture (CeBar), Dr Rofina Yasmin Othman.

Yet, this academician is not surprised that the project was less than successful. Says Rofina, 'How do you expect the project to be successful if all the current researchers from local universities were roped in to run another research facility concurrently? If the project had been scaled down, it could have been successful.'



Rofina: *If the BioValley project had been scaled down, it could have been successful*

Mahaletchumy says it was expected that BioValley would woo investors to set up their businesses and projects in Malaysia. 'But investors were looking for more than just buildings. They wanted a strong research capacity, potential projects that could be turned into commercial activity, a good pool of knowledge workers, a good record of scientific publications, competitive financial incentives and facilities to patent locally, all of which were lacking in one way or another at BioValley,' she says.

So what happened actually? Iskandar declines to comment but hints that the lack of commercialisation and demand might have resulted in the project's failure. 'How do you develop the industry when the entire spectrum from research to commercial production is unavailable?' he asks.

With the NBP, Iskandar hopes Malaysia would improve its legal and regulatory framework to facilitate innovation and generation of intellectual property. His MBC will become the main agency to bring together academia, investors, businesses

TABLE ONE The Nine Thrusts of the National Biotechnology Policy

The National Biotechnology Policy is underpinned by nine policy thrusts:

Thrust 1: Agriculture Biotechnology Development

Transform and enhance the value creation of the agricultural sector through biotechnology.

Thrust 2: Healthcare Biotechnology Development

Capitalise on the strengths of biodiversity to commercialise discoveries in natural products as well as position Malaysia in the bio-generics market.

Thrust 3: Industrial Biotechnology Development

Ensure growth opportunities in the application of advanced bio-processing and bio-manufacturing technologies.

Thrust 4: R&D and Technology Acquisition

Establish centres of excellence in existing or new institutions, and bring together multidisciplinary research teams in co-ordinated research and commercialisation initiatives. Accelerate technology development via strategic acquisitions.

Thrust 5: Human Capital Development

Build the nation's biotech human resource capability in line with market needs through special schemes, programmes and training.

Thrust 6: Financial Infrastructure Development

Apply competitive 'lab to market' funding and incentives to promote committed participation by academia, the private sector as well as government-linked companies. Implement sufficient exit mechanism for investments in biotech.

Thrust 7: Legislative and Regulatory Framework Development

Create an enabling environment through continuous reviews of the country's regulatory framework and procedures in line with global standards and best practices. Develop a strong intellectual property protection regime to support R&D and commercialisation efforts.

Thrust 8: Strategic Positioning

Establish a global marketing strategy to build brand recognition for Malaysian biotech and benchmark progress. Establish Malaysia as a centre for Contract Research Organisation and Contract Manufacturing Organisations.

Thrust 9: Government Commitment

Establish a dedicated and professional implementation agency overseeing the development of Malaysia's biotech industry, under the aegis of the Prime Minister and relevant government ministries.

and government ministries in one big partnership.

THE BIONEXUS

With BioValley all but forgotten, the NBP created a new technology hub, BioNexus Malaysia. Essentially, BioNexus is a network of companies and research institutions with three main centres: agro-biotechnology at Mardi and Universiti Putra Malaysia in Serdang; genomics and molecular biology at Universiti Kebangsaan Malaysia, Bangi; and pharmaceutical and nutraceuticals at the former BioValley site in Dengkil.

'Instead of reinventing the wheel, this is a better strategy as these centres already have some track record in their respective fields of research,' says Mahaletchumy.

Some say BioNexus is a less ambitious project that was conjured up to replace BioValley. 'It is not a scaled-down project,' says Iskandar. 'There is little understanding of the new BioNexus project. This is not a geographical location but a net of research facilities in Malaysia.' For him, BioNexus is a business model for biotech companies to adapt science and technology to make market sense. 'We do not need a specific location. We are capitalising on our current research facilities.'

A BUMPY ROAD?

Despite all the NBP implementations in place, Mahaletchumy says Malaysia still faces two most important hurdles – the lack of technical expertise and the reluctance of venture capitalists to invest in biotechnology projects.

Accordingly, Malaysia needs to increase the pool of local experts so the nation could rely less on foreigners. 'A culture of research should be cultivated and students exposed to various fields related to biotechnology such as microbiology, biochemistry, genetics, molecular biology, biomedical science and environmental science,' she says, adding that more dedicated scientists are needed to excel in biotechnology.

The new hub represents the future hopes of the nation. Science, Technology and Innovation Minister Datuk Seri Jamaludin Jarjis said during the launching of the NBP: 'Although biotechnology has been around and progress has been made, there has been no cohesive policy to provide overall direction.'

Iskandar admits so. 'There was a lack of concerted effort,' he says but refuses to comment on what went wrong, especially at BioValley. Rofina believes the future would remain bumpy if there was little collaboration between the industry and research institutions.

'The industry must provide support for research institutions,' says Rofina. 'At the University of Malaya, many discoveries were made and a few projects were patented and rights given to commercialise them. Yet, at times, some discoveries were simply left idle with no commercial takers.

Rofina says despite MBC setting up office six months ago, no official had approached her department (as at the time of writing) to offer any assistance or enquire about potential linkages with her department. Interestingly, as the coordinating agency of the nation's biotechnology efforts, shouldn't NBC be the first to court the nation's top research facility?

LABORATORY SCIENCE TO BUSINESS

Perhaps six months is a little too short to quantify MBC's business deals in the biotechnology sector. Nonetheless, Iskandar is fully aware that all successful biotechnology starts have to come from the research lab. 'Biotechnology is only a means to create science into a business opportunity,' he says.

'This is not merely about doing scientific research in the labs. It is putting a product or service on the shelf.' Iskandar says he believes in science, almost anything is possible, but to have a product that is commercially viable is a different story altogether. He wants to create a market that can uplift the livelihood of ordinary Malaysians.

But Rofina believes otherwise. 'Although it is important to commercialise scientific

BIOTECHNOLOGY IN AGRICULTURE

WITH a strong agricultural base, it is only natural that the National Biotechnology Policy places the strongest emphasis on agriculture biotechnology.

'We need more research to improve our agricultural produce, increase yield, and introduce new breeds which are resistant to pests and pathogens,' says Malaysian Biotechnology Information Centre programme director Mahaletchumy Arujanan.

For the past 15 years, Mardi has been the pioneer of agri-biotechnology in Malaysia. Its main objectives is to apply biotechnological approaches to improve the quality and quantity of agricultural produce and to complement on-going conventional agricultural approaches. At Mardi, says its deputy director, Dr Umi Kalsom, the areas of focus include plant, food and animal biotechnology.

Among Mardi's earlier breakthroughs are tissue culture and its application in plant breeding and in the production of elite planting materials. 'Tissue cultures of fruit crops such as banana, pineapple and papaya were actively pursued and these discoveries are commercialised and adopted by farmers in Malaysia,' says Umi.

She says the Biotechnology Research Centre at Mardi is currently applying cutting-edge research in the area of molecular biology, genetic engineering and bio-processing and diagnostics, with the vision to transform and modernise the agricultural sector.

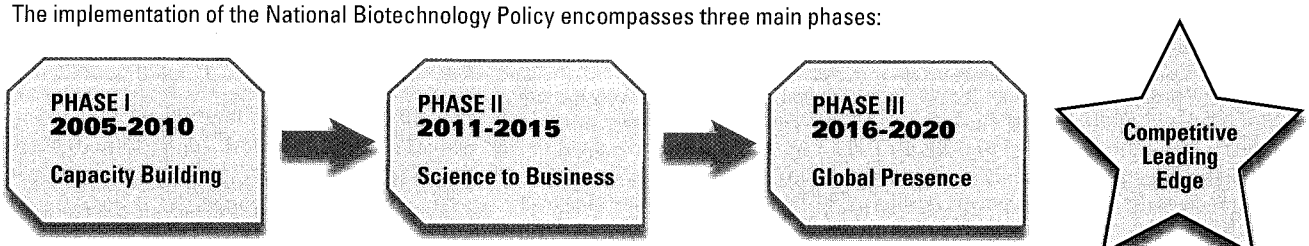
But there can be more to agri-biotechnology than merely improving the livelihood of farmers. 'With our rich biodiversity and rainforest, agricultural biotechnology can be extended to pharmaceutical and nutraceutical areas. Producing vaccines, antidotes and biologically active compounds from the rainforest is seen as a potential business,' says Mahaletchumy

She believes there are also many Malaysian companies that are jumping on the biotech bandwagon by producing capsules derived from some potential medicinal plants. 'We must be aware that simple extraction from plants and herbs does not merit biotechnology status,' she says.

TABLE TWO

Implementation Approach

The implementation of the National Biotechnology Policy encompasses three main phases:



- Establishment of advisory and implementation councils
- Establishment of Malaysian Biotech Corporation
- Education and training of knowledge workers
- Development of legal and IP framework
- Business development through accelerator programmes
- Build Malaysian branding
- Initial job and industry creation in agricultural biotech, healthcare biotech, industrial biotech and bio-informatics

- Develop expertise in drug discovery and development based on natural resources
- New products development
- Technology acquisition
- Intensify investment promotion
- Intensify spinning-off of companies
- Strengthen branding
- Develop capability in technology licensing
- Knowledge intensive job creation

- Consolidate strengths and capabilities in technology development
- Further develop expertise and strength in drug discovery and development
- Strengthen innovation and technology licensing
- Promote global Malaysian companies

breakthroughs, it must not be done at the expense of fundamental research for educational purposes.' She notes that although it is not easy to commercialise an academic research project, there must be industrial encouragement for academia in terms of funding.

Yet, the shift from the lab to the commercial front may not be easy. Mahaletchumy says biotechnology projects require large investments and are normally risky, with long gestation periods. Indeed, funding for commercialisation of biotechnology projects by the private sector is hard to come by because of the nature of such projects. 'We need to impress foreign investors with excellent R&D facilities, tax incentives and proper Intellectual Property (IP) schemes,' she adds.

'The biotech incubation period is known to be relatively long. However, if we start right we will eventually get there,' says Umi Kalsom. She believes the most important factor is to start right although it could be slow at first. 'After 15 years of biotech R&D, Malaysia has generated enormous R&D outputs. Sadly, very little or none are able to be commercialised because the next process in the commercialisation path is not well defined or addressed in Malaysia.'

INTERNATIONAL COOPERATION AND COMPETITION

'The biotechnology industry is a marathon,' says Iskandar. He believes, with such a long incubation period, it is inevitable that Malaysia needs international collaboration and competition. 'You need foreign collaboration to succeed,' he says. His idea of cooperation includes various universities working together on a shared platform.

But can Iskandar's model be the long-term solution for Malaysia? After a while, would foreign institutions be keen to continue collaborating without having a stake in Malaysia?

Says Mahaletchumy, 'Attracting foreign researchers to Malaysia is vital as a short-term strategy. This is because we will not be able to produce enough graduates and postgraduates in the right fields to fill the vacancies and to start new projects.'

But for the long term, she says, Malaysia needs experienced workers to transfer their knowledge and train Malaysians. But before all these can take place, Malaysia must acknowledge that it still lacks the research culture, dedication and continuity to attract scientists. Monetary incentives alone will not woo both foreign as well as returning scientists.

If we start right we will eventually get there. – Umi Kalsom

Mahaletchumy says a good selection and screening process is also required. 'We must bear in mind that not all foreign researchers are skillful or good,' she says.

With foreign cooperation comes international competition, and BioNexus' main competion is just across the causeway – Singapore Biopolis. According to a foreign report, Biopolis, established in April 2004, has become a formidable

THE BUSINESS OF BIOTECHNOLOGY

WITH so many incentives for biotechnology activities, why is there only a handful of local and foreign biotech companies in Malaysia? All this may soon change. Last month alone, two major Malaysian-based biotech companies announced major plans for biotechnology investment.

Carotech Bhd plans to invest over RM100 million in R&D to produce more commercially viable biodiesel products. Its managing director David Ho Sue San says the company was in talks with several bankers to raise funds for its biotechnology expansion. 'Our immediate focus is on expanding production capacity and increasing R&D for future biodiesel products,' he told a local daily.

Uchi Technologies Bhd's managing director Edward Kao Te-Pei is unveiling a new range of prototype devices for the biotechnology industry in December. The company, which supplies medical equipment to large European biotechnology companies, plans to increase its revenue contribution from its biotechnology division to 50% from the current 20% over the next five years.

Malaysian Biotechnology Corporation Sdn Bhd's (MBC) chief executive officer, Iskandar Mizal Mahmood, believes these two companies would only be the start of a total new biotechnology environment in Malaysia. 'What we need first is the right conducive environment for biotechnology business,' he says.

The National Biotechnology Policy launched in April 2005 has provided various incentives for biotech companies. Following are some of them:

1. **Incentives for holding companies.**
   A holding company owning at least 70% of an approved biotechnology firm can claim
   a) Group relief whereby its income can be offset by losses incurred by its approved subsidiary biotechnology company or
   b) Deductions for the investment in its approved subsidiary biotechnology company against its profits.
2. **Tax exemption for biotechnology companies**
   Approved biotechnology companies will be eligible for
   a) Pioneer status: 100% income tax exemption for a period of up to 10 years or
   b) Investment tax allowance: 100% of qualifying investments over a period of five years can be set off against profits (this incentive is not available if holding company incentives have been claimed).
3. **Dividends distributed from tax exempt biotechnology companies will be treated as tax-exempt income for its shareholders.**
4. **Import duty and sales tax exemption on approved biotechnology equipment and materials.**
5. **Double deduction for qualifying expenditure on R&D.**
6. **Double deduction for qualifying expenditure on export promotion.** mb

biomedical sciences research hub in the world.

Iskandar asserts that BioNexus and Biopolis have different approaches. He notes that Malaysia's main thrust is on agriculture biotechnology while in Singapore, the focus is on healthcare and pharmaceuticals.

According to estimates, 70% of the biotechnology industry caters to healthcare. Rofina says Singapore's model is a good short-term solution as it managed to set up a complete research facility in the short-term frame with foreign expertise. 'But what is the local content of such projects?' she says.

Umi Kalsom believes that it is till too early to compare BioNexus with Biopolis. 'Right policies and strategic plans are essential to progress rapidly. Malaysia has more potential than Singapore to excel in biotechnology because of our vast natural resources,' she says.

Mahaletchumy concurs. 'Malaysia's competitive advantage lies in its rich biodiversity and strong agricultural base,' she says.

CHALLENGES AHEAD

Jamaludin identifies three focus areas for biotechnological development, namely agricultural, healthcare and industrial. The question is, how do we spearhead the industry? Can Malaysia attract the best international names to set up base? Or does Malaysia have to depend on its homegrown talent? *(See box story on this page on Malaysian biotechnology companies.)*

Iskandar says a major challenge is the lack of funding. For Rohina, her department receives an annual budget of about RM1.5 million under the Eighth Malaysia Plan, but for the Ninth Malaysia Plan, she has yet to receive any confirmation of funding.

Interestingly, the lack of funding may not be a major issue. According to Mahaletchumy, the recently set-up SME Bank, with a capital of RM1 billion, is expected to ease the burden of starting up new ventures and commercialisation.

'Bio-technopreneurs can also apply for a grant from the Commercialisation of Research and Development Fund (CRDF) and Technology Acquisition Fund (TAF) to commercialise the products,' she says.

Furthermore, the nation's experience in the electronic sector and Multimedia Super Corridor (MSC) would come in handy. 'We can learn from our past mistakes,' says Mahaletchumy.

Perhaps this is in line with Prime Minister Abdullah calling for the MSC to provide the leverage for the development of bio-informatics.

There are an estimated 5,000 biotechnology companies worldwide with a market capitalisation of US$700 billion and annual turnover of US$75 billion. Malaysia wants a piece of the pie.

The NBP shows the Government's commitment in providing a conducive environment. For now at least, there are financial incentives such as grants and tax allowances to attract the best biotechnology ventures along the entire research and industry value chain. Is that a hype?

Mahaletchumy says under Budget 2006, the Prime Minister has taken some strong steps to give biotechnology a jump-start. Among them is the setting up of the Malaysian Life Sciences Capital Fund with an initial fund of RM100 million.

'The onus lies on the entrepreneurs to prove themselves worthy for investors to part with their money,' she says.

Asserts Rofina, 'What we need is a paradigm shift in the biotechnology industry. We have to be brave and willing to make changes.' mb