



UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

Importance of Establishing IP & Technological Innovation Policy & Strategy in Universities & R&D Institutions



Mohamed Shariff Mohamed Din

Advisor, Putra Science Park
Universiti Putra Malaysia

Mohamed Shariff

- ☺ **Universiti Putra Malaysia (since 1977)**
- ☺ **Doctor of Veterinary Medicine**

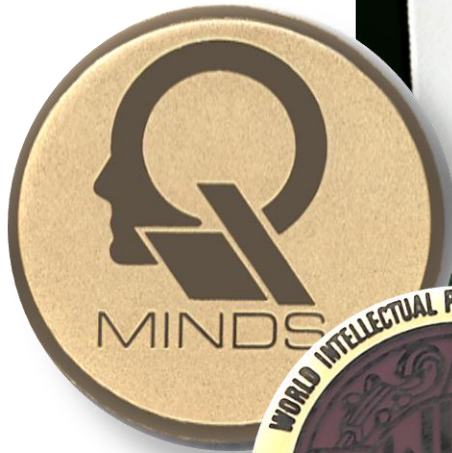
Fish/shrimp doctor



FAST TARGET™ WHITE SPOT VIRUS DETECTION KIT

2000

Sold in a few countries



Mohamed Shariff



2006 -2010



**Director, Innovation and
commercialisation Cen**



2010 - 2013

**Director,
Putra Science Park**

- **Scientists**
- **Inventor**
- **Commer
technology**
- **Established
Comm.
Centre > 7 yrs**
- **Still fish Dr.**

General introduction to UPM

Leading research university in Malaysia is located in Serdang, next to Malaysia's administrative capital city;
As a world renowned centre of learning and research, UPM has attracted students and staff from all around
making it a well- respected global entity.



UPM main campus



**>12,000
hectares**

UPM Faculties

- Agriculture
- Biotechnology & Biomolecular Sciences
- Computer Science & Information Technology
- Design & Architecture
- Economics & Manage.
- Educational Studies
- Engineering
- Environmental Studies
- Food Science & Tech.
- Forestry
- Human Ecology
- Medicine & Health Sciences
- Modern Languages & Communication
- Science
- Veterinary Medicine
- Agri. & Food Sciences

Total :

16



Human Capital

Professor	197
Associate Professor	349
Senior Lecturers/Lecturers	1611
Administrative Staff	918
Support Staff	3427
Total	6502

83.8%
Academic Staffs with PhD

2157



Number of Students

Level	Local	Inter- national	Total	
Undergraduate	15, 495	696	16, 191	60%
Postgraduate	7,369	3,412	10, 781	40%
Total	22, 864	4,108	26, 972	

Patents Granted

182

704

Patents Pending

Industrial Design

104

281

Copyright

Cumulative Patent 2012

- 
- Australia
 - Brazil
 - Canada
 - China
 - Egypt
 - European
 - Hong Kong
 - India
 - Indonesia
 - Japan
 - Korea
 - Libya
 - Mexico
 - Morocco
 - New Zealand
 - Philippines
 - Singapore
 - South Africa
 - Sri Lanka
 - Switzerland
 - Taiwan
 - Thailand
 - UAE
 - United Kingdom
 - USA
 - Vietnam

108

Filed in
Foreign
countries

Commercialisation

- **Products commercialized 97**
- **Gross Sales > \$16.5 million**
- **Income** (*royalty, licenses fee, outright*)
= \$2.9 millions

2015



Requirements for Innovation

**Research that benefits
the nation**

Commercialization: Moving to the global market



- Pakistan
- India
- Philippines
- South Africa
- Guam
- Papua New Guinea
- Thailand
- Vietnam
- Egypt
- Turkey
- United Arab Republic
- Indonesia
- Bangladesh
- China
- Sudan
- Cameroon
- Nigeria
- USA



**R&D
necessary
to make
product
technologically
competitive**

Gross sales >US\$7 Million

Preparing Malaysia Today for Tomorrow

Scientific
Discovery
50kDa
1986-1991

Dot EIA
(Require
cold chain)



1998



1994



1997

Immuno- chro
matography
(No cold chain)

TYPHIrapid™

15 min



2004

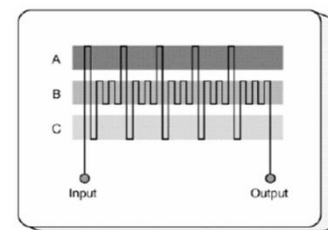
Thermo
stabilised
PCR

EZ TYPHI carrier DNA



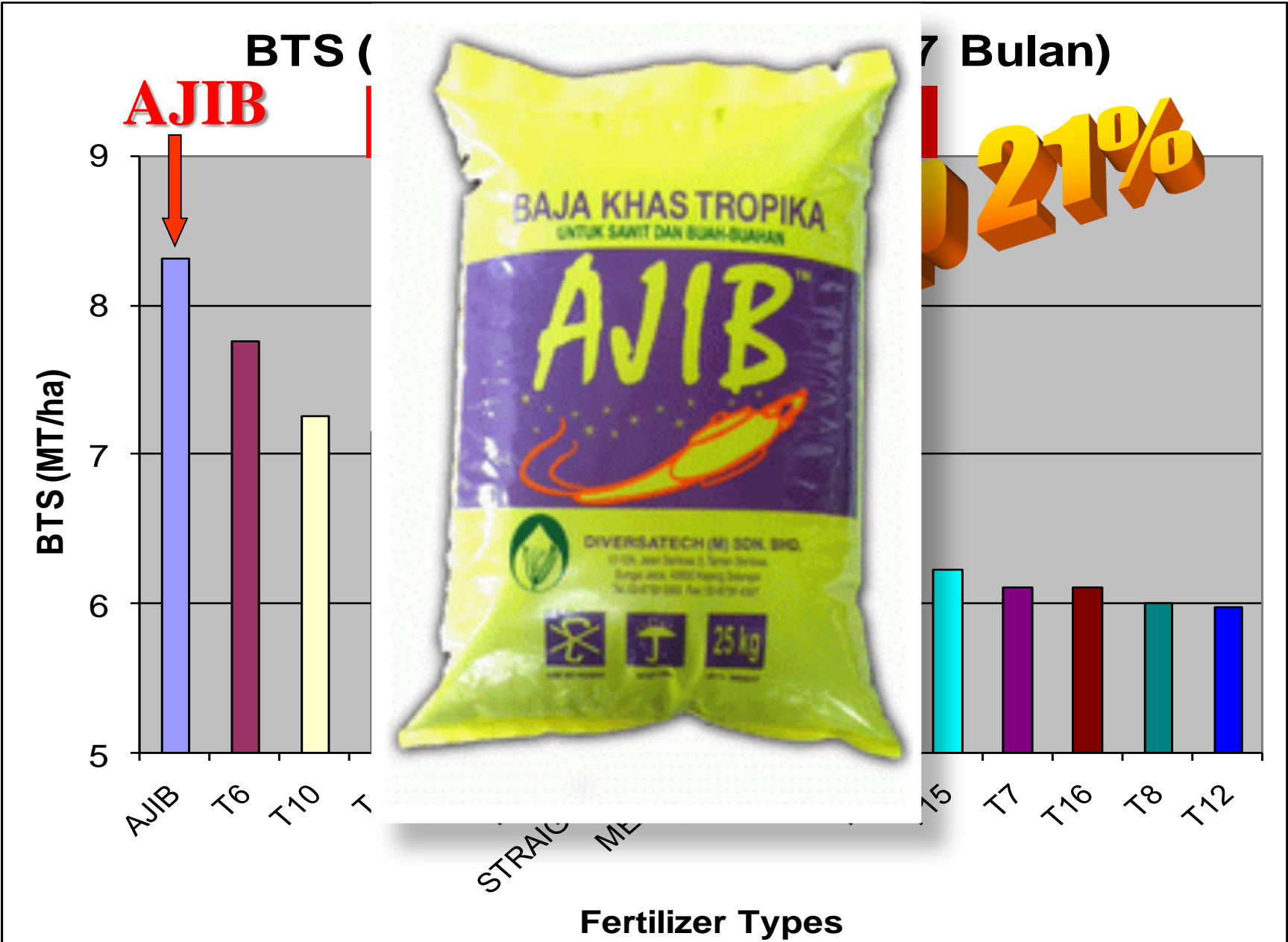
2005

Universal
PCR Chip
(Nanotech
nology)



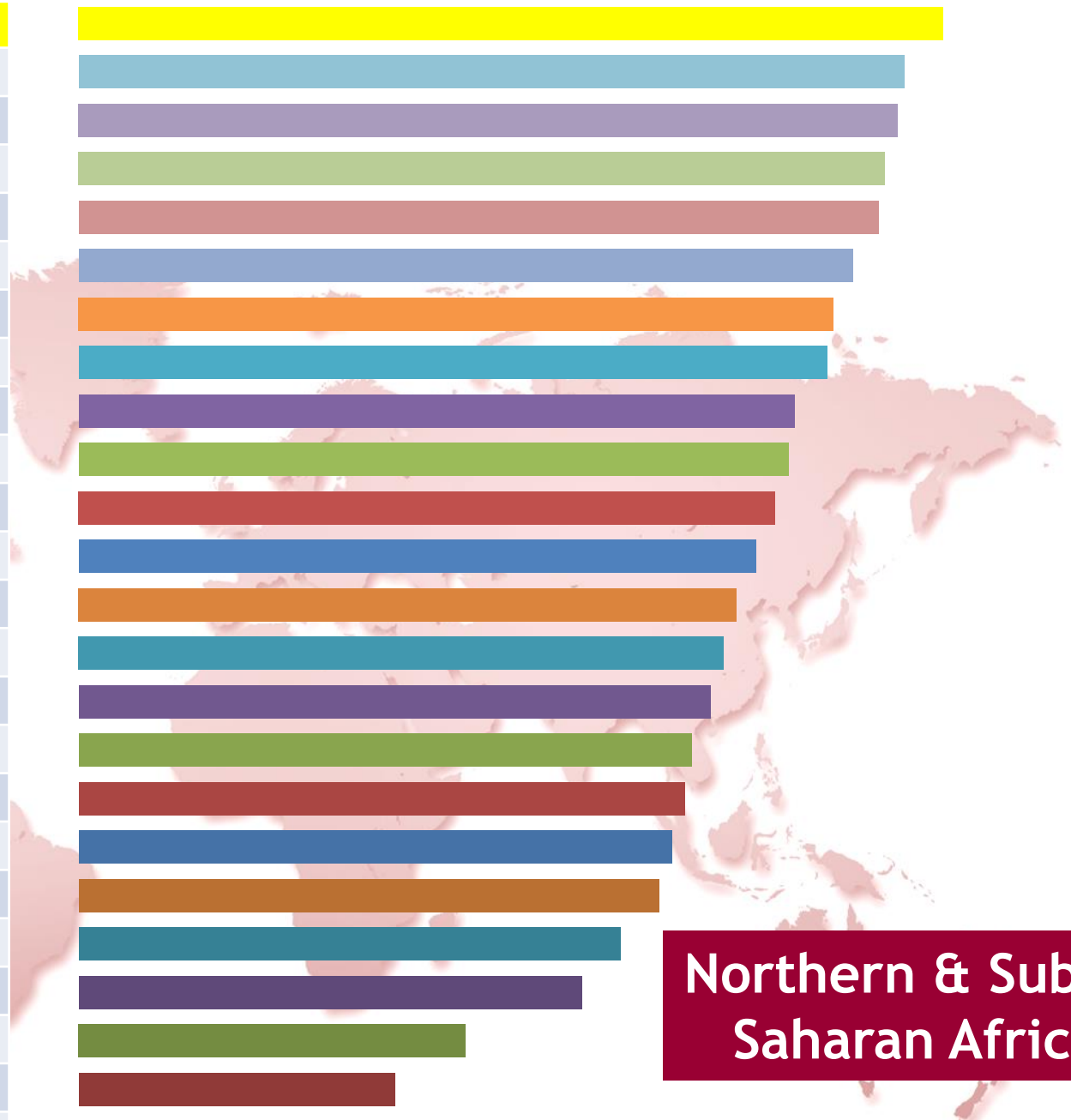
2008

Rank top out of 16 others products !



Global Innovation Index 2014-2015

2015	2014	Country
32	33	Malaysia
49	40	Mauritius
60	53	South Africa
78	84	Morocco
84	98	Senegal
90	92	Botswana
92	85	Kenya
94	102	Rwanda
95	107	Mozambique
98	113	Malawi
100	99	Egypt
102	109	Burkina Faso
105	119	Mali
108	96	Ghana
110	114	Cameroon
111	91	Uganda
116	116	Cote d'Ivoire
117	123	Tanzania
120	135	Angola
124	121	Zambia
125	124	Madagascar
127	126	Ethiopia
128	110	Nigeria
134	131	Niger



Northern & Sub-Saharan Africa

*Transforming
Malaysia into
Innovation – led
Economy*

Success: from

zero

to

world top

producer

Origin of rubber plant to Malaysia



Brazil



**Kew Gardens
London**

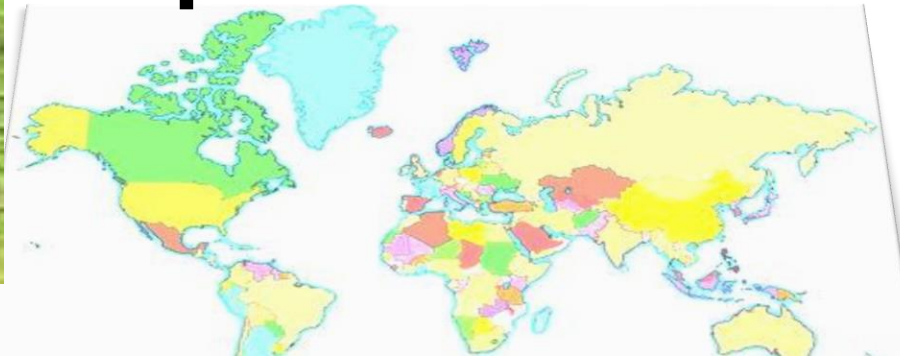


Natural Rubber - Malaysia

- Prior to 1957, economy heavily dependent on primary products
- 1990 - World's largest producer



**1/4 of world
production**



Natural Rubber



Exported raw commodity - source of cash income for millions of rural household

Natural Rubber



**Processing
raw rubber
sheets**

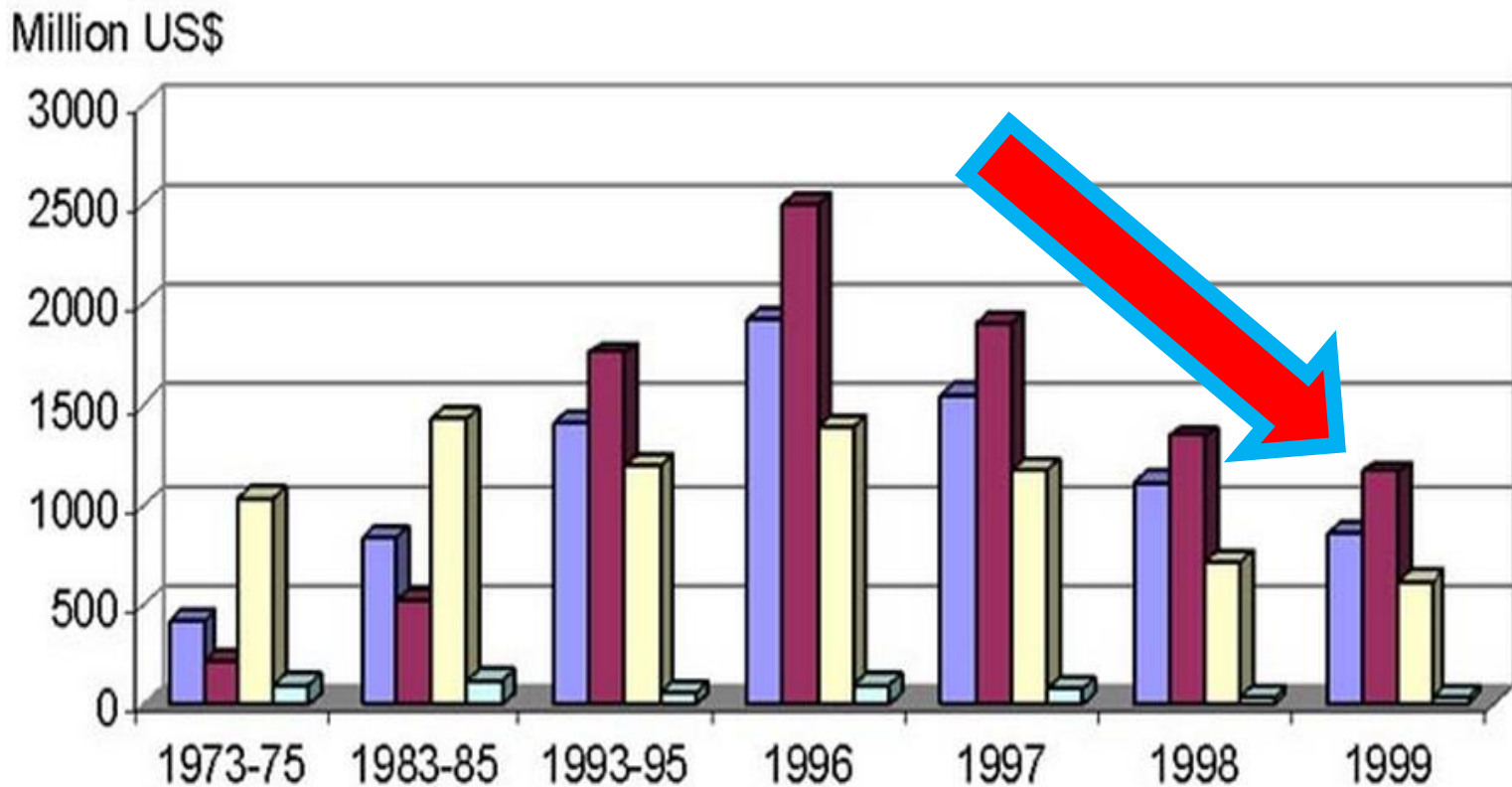
**Exported smoked
rubber sheet**

**Sold at relatively
low price**



Drop in value of agriculture (Rubber) based commodities

Exports Value of Natural Rubber by Major Exporters



Blessing in disguise!

Globalization

**Cannot be complacent or else
we will be dependent on
other forever!**



**Have to compete with
the rest of the world!**



**Today
Malaysia**



**world's leader
in medical
gloves**

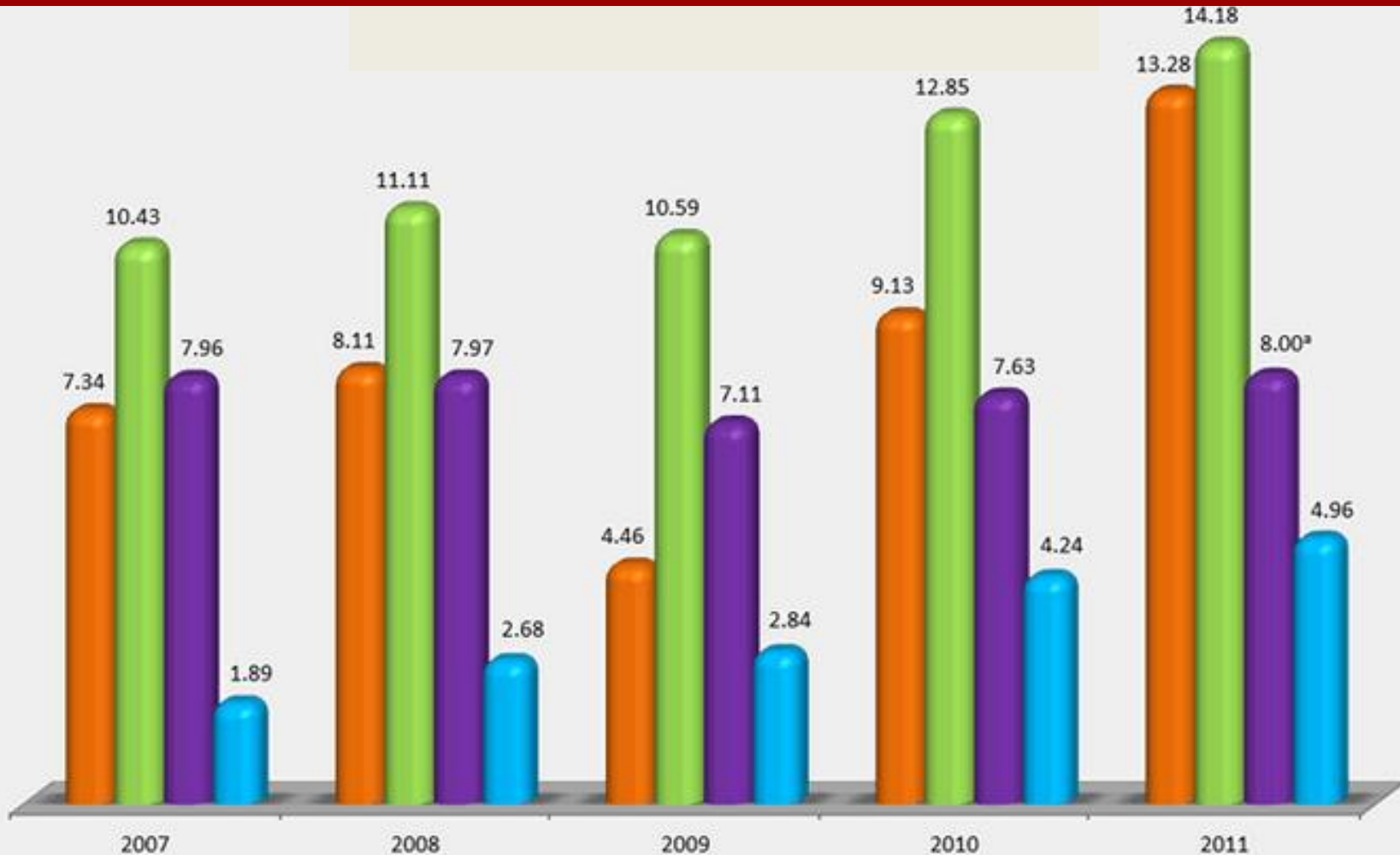
GOODYEAR



BRIDGESTONE
Your Journey, Our Passion



Malaysian export earnings from natural rubber & rubber products (Value in RM Billion)



■ Natural Rubber

■ Rubber Products

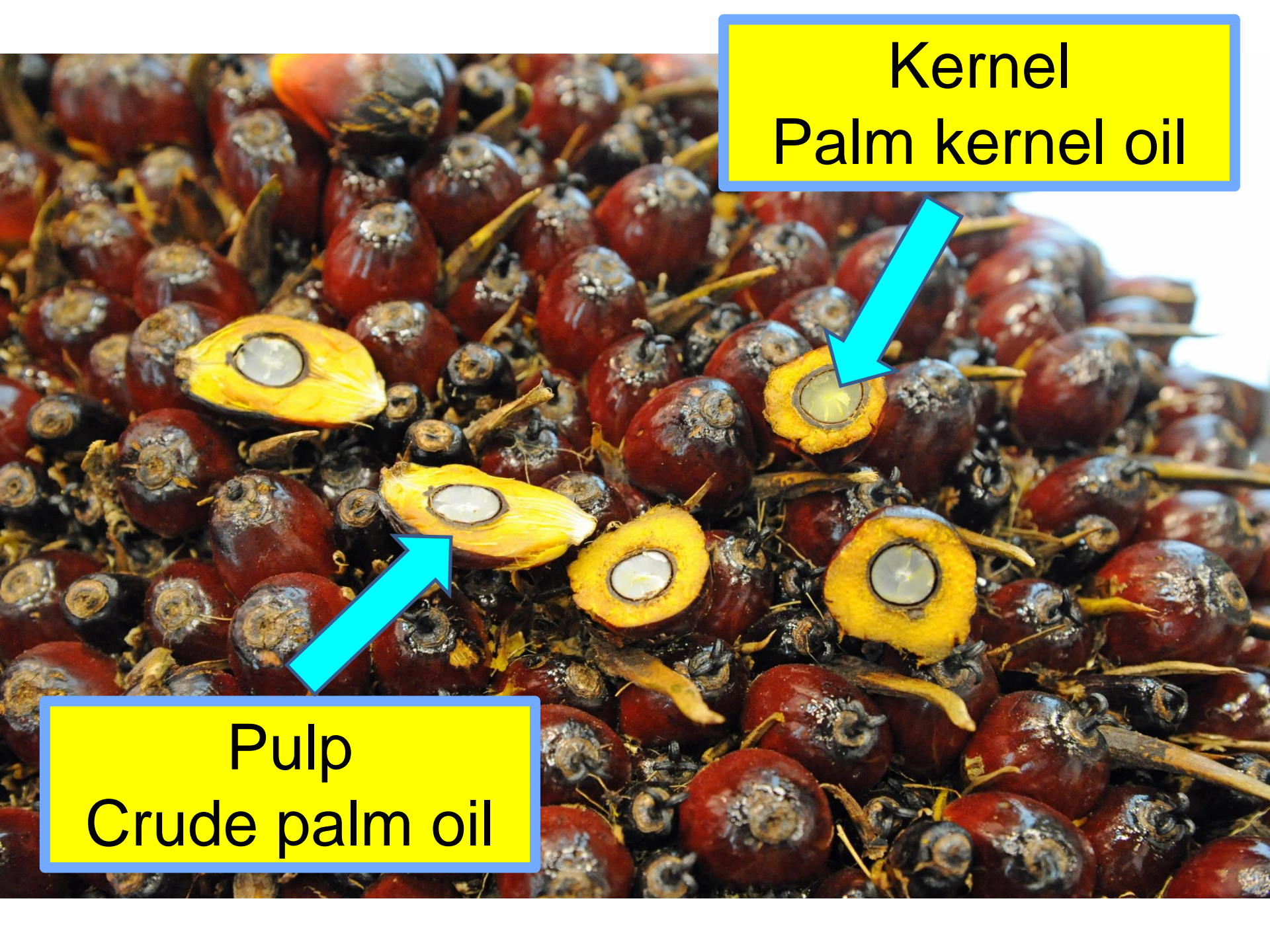
■ Heveawood Products

■ Other Rubber





Fresh fruit bunches



Kernel
Palm kernel oil

Pulp
Crude palm oil

An aerial photograph of a large-scale palm oil plantation. The image shows vast, organized rows of young palm trees stretching across a valley. In the center, a prominent blue pond is surrounded by greenery. To the left, a cluster of industrial buildings, likely a palm oil mill, is visible. The background features rolling hills and more plantation areas. The overall scene depicts a well-managed agricultural landscape.

Palm oil industry

5 million ha

2nd world largest producer

Produced 18.7 million tonnes

2011 - \$26 Billion

**Introduced from Africa to
Malaysia!**

Historical perspective

Ghana

- ❑ British establish plantation in 1900
- ❑ Independence 1957
- ❑ Industry small industry by global standard
- ❑ 2008 – 300,000 ha

Malaysia

- ❑ British establish plantation in 1917
- ❑ Independence 1957
- ❑ Production increased dramatically & expanded into higher-value products
- ❑ 2008 > 2,000,000 ha

*How did we
do it?*



Strategies & Roadmaps

MALAYSIAN POLICY

National Biomass Strategy 2020



**New wealth creation
for Malaysia's palm oil**



**Increase growth National
Income (GNI) to \$10
billion**

Success due to appropriate policies & strategies



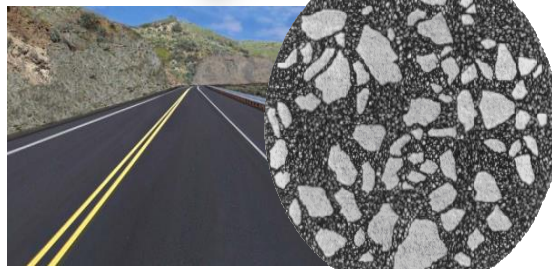
develop renewable

Act of Parliament:

- \$3.50 /MT of CPO produced for R&D = \$65 million**
- \$.60 for promotional activities = \$12.5**

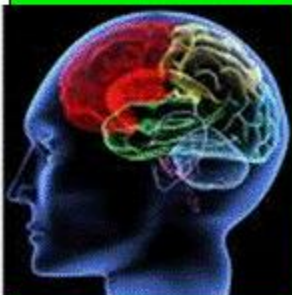
Oil Palm

R&D



Exploitation of oil palm phenolics

- Antioxidant
- Anti microbial
- Anti atherogenic
- Anti cancer
- Anti diabetic
- Anti hypertensive
- Anti inflammatory
- Anti obesity
- Anti spasmodic
- Anti thrombotic
- Anti allergenic
- Anti ulcer
- Memory enhancing



Confirmed:

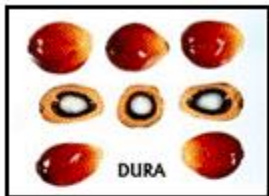
In vitro,
whole animal
and
microarray studies



GENETIC ENGINEERING OF THE OIL PALM



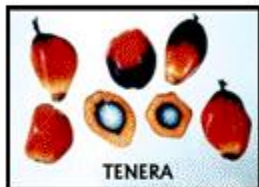
Targeted Traits



**FRUIT FORM
(SHELL)**



**TISSUE CULTURE
UNIFORMITY**



TENERA



FRUIT COLOUR



PISIFERA

YIELD



HEIGHT



DISEASE RESISTANCE



Diversification by adding value to biomass

Abundance of Biomass –
110 million tons 2020

Biomass



OIL PALM FRONDS



FRESH FRUIT BUNCH



OIL PALM TRUNK



Crude Palm Oil



Biofuel / Biodiesel



Palm Biomass



Fuel for CHP



Palm oil mill effluent (POME)



Biogas

10% oil
90% biomass



BIG PICTURE BIOMASS UTILIZATION FOR PALM OIL INDUSTRY EB GROUP

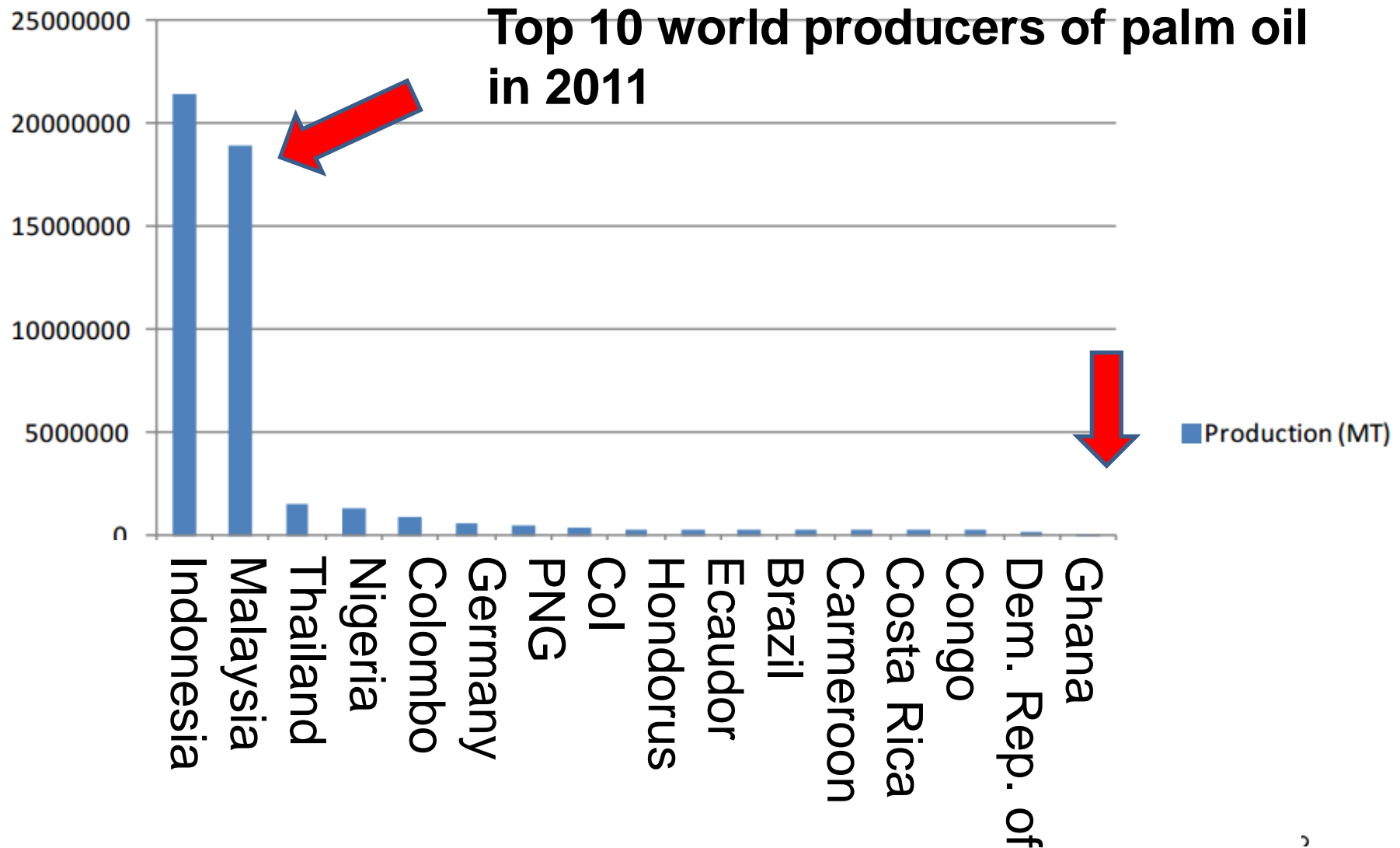
BIG PICTURE

of ENVIRONMENTAL BIOTECHNOLOGY RESEARCH GROUP

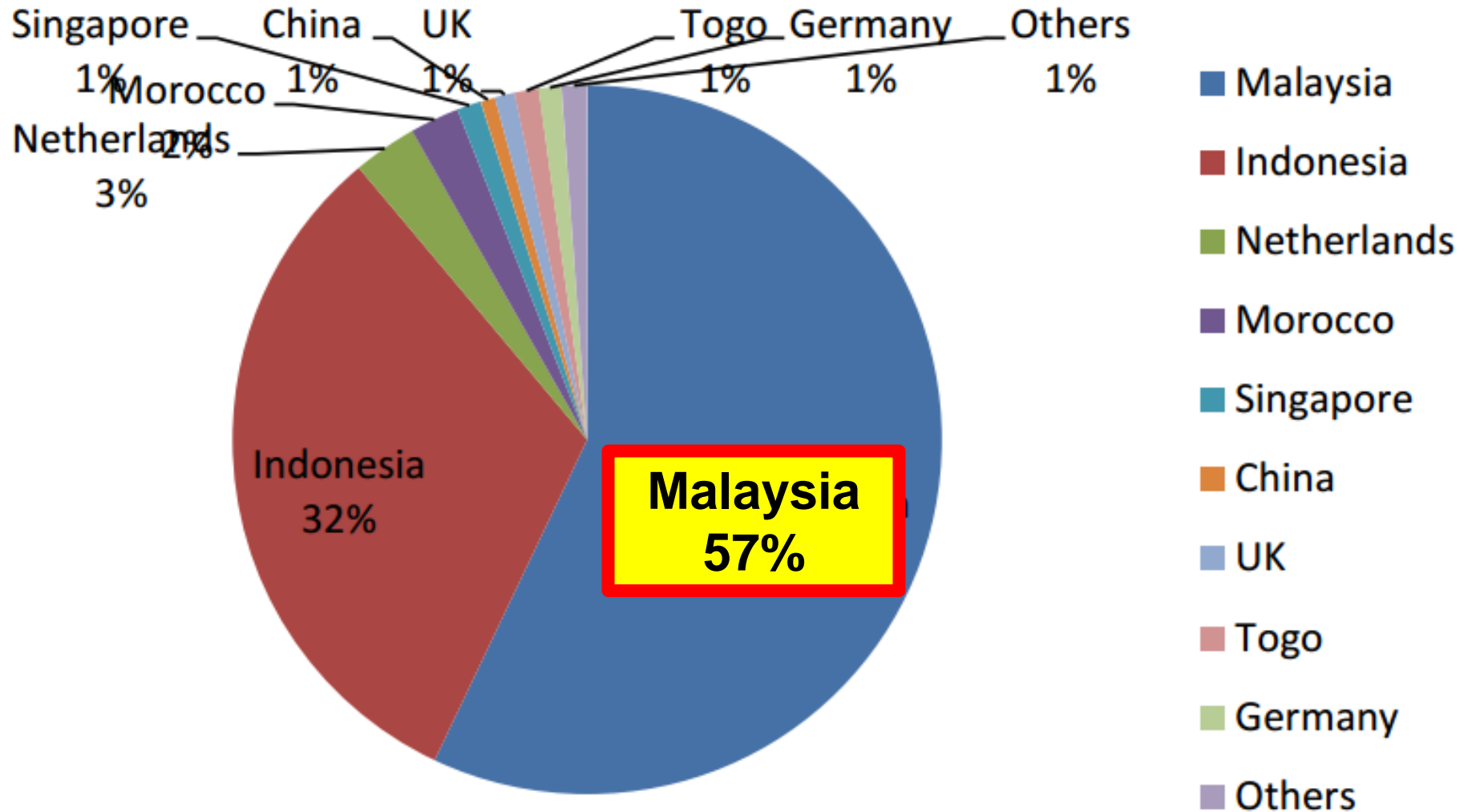


Waste to wealth

Ghana 1st country British started oil palm plantations in 19th century



Countries exporting palm oil to Ghana (average share, 2005-2010)



Source: UN Comtrade, 2012

Disincentives for Palm Oil in Ghana

- ❑ Poor attention at policy level
- ❑ Lack of diversification into added products
- ❑ Negative impact
 - High access costs
 - Illicit taxation

In Malaysia

- Several Strategies/ Policies
- Established Institutions
- Incentives - upstream & downstream products
- Capital Investment incentives

Exploitation of IP & Appropriate Policies/Strategies makes the difference between success & failure

*Success: due to
appropriate
policies &
strategies*



Patent - financial benefit to nation

20% Oil Extraction Rate (OER)

\$26 Billion (2011)



OER increased by 1%

+ \$260 million

increase by 2%

+ \$320 million

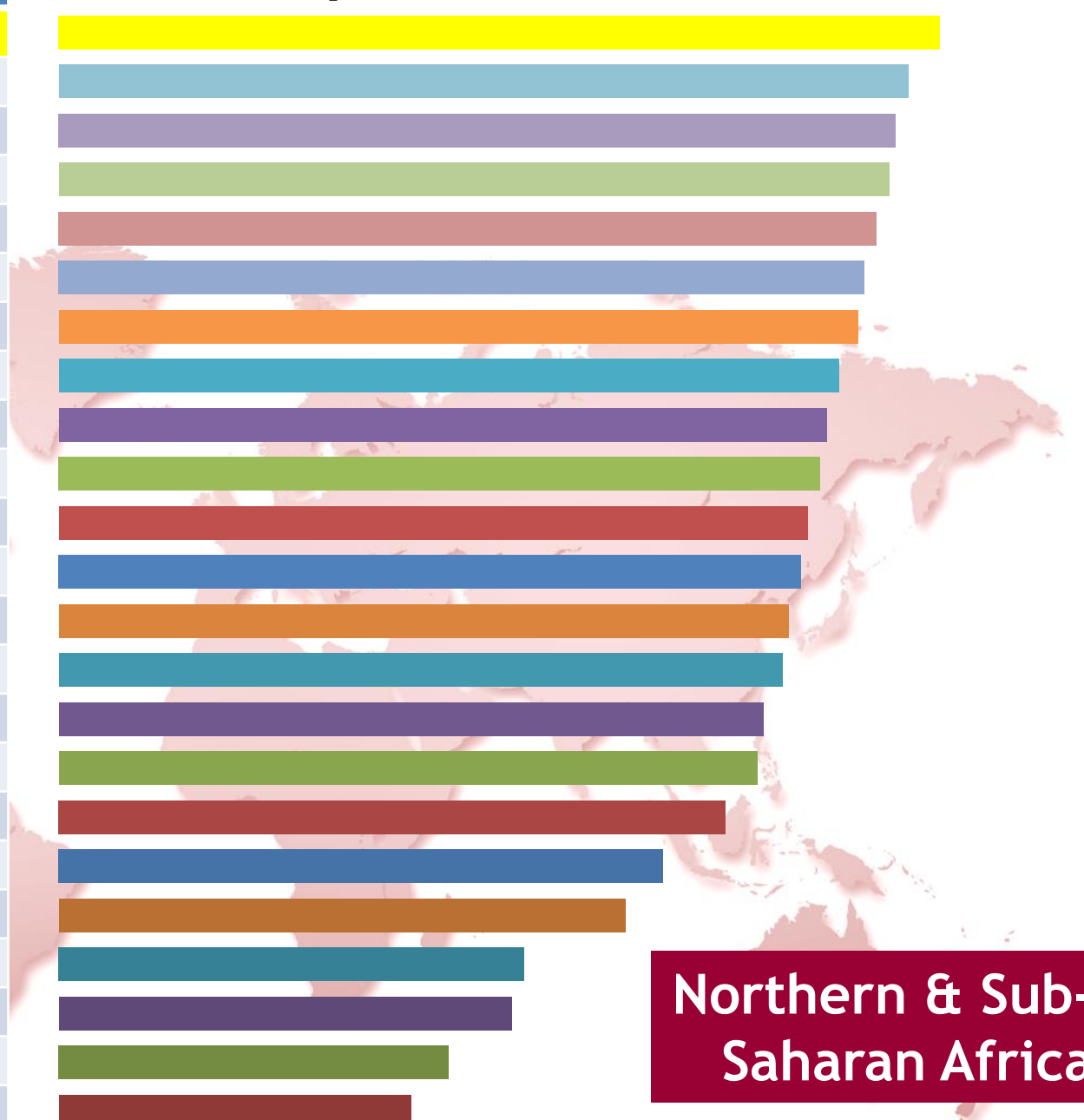
Without IP strategy/policies

Waste valuable resources & miss opportunities to protect valuable assets



Global Competitiveness Index 2013-2014

2014	2013	Country
20	24	Malaysia
39	45	Mauritius
56	53	South Africa
62	66	Rwanda
72	77	Morocco
74	74	Botswana
90	96	Kenya
96	93	Zambia
106	112	Gabon
111	114	Ghana
112	113	Senegal
115	126	Cote d'Ivoire
116	115	Cameroon
118	127	Ethiopia
119	118	Egypt
121	125	Tanzania
122	129	Uganda
124	131	Zimbabwe
127	120	Nigeria
128	135	Mali
130	132	Madagascar
132	136	Malawi
133	137	Mozambique
135	140	Burkina Faso



Northern & Sub-Saharan Africa

Innovation a key factor

It's vital to help increase productivity, competitiveness



Business

INNOVATION is a vital ingredient to increasing productivity and ultimately raising the competitiveness of the country.

Through exploitation of the same basic resource.

Innovation and development will promote growth across the country.

The business process. For example, by ensuring a competitive right price.

Investing in science, research and education serves as a powerful engine of innovation in an economy.

The Government of action innovation system along four key dimensions; shaping a supportive ecosystem for innovation, creating innovation in place, funding innovation.

and nurturing new ventures through incubators. The success of innovation agenda requires the best academic leadership for programmes that support innovation, and will also partner with stakeholders that minimise the stigma of failure and allow those who failed in the first instance to

will be a push towards green technology through the National Green Technology Policy, in preparation for the next generation of products and services that are more competitive and safer. Regulatory changes are needed to drive innovation. There will be a push towards green technology through the National Green Technology Policy, in preparation for the next generation of products and services that are more competitive and safer.



to promote participation from the industry to co-sponsor employees to obtain industrial PhDs. Information technology (IT)

sector financing with Public Private Partnerships as an intermediate step. The Government will support development of knowledge-based schemes, improving innovation capabilities through specialised

Without linking scientific knowledge to innovation policy, it is impossible to have sustainable development

Investing in science, research & education serves as a powerful engine of innovation in an economy

To increase productivity, & ultimately raising competitiveness of the country

Role of Public Policies & Institutional Policies

Role of public & institutional policies

- ❑ Increase R&D funds
- ❑ Support innovative activities in public & private sector
- ❑ Support for public – private sector partnership

Role of public & institutional policies

- ❑ Stronger efforts to combat counterfeiting & piracy
- ❑ Serious & growing problems

Policies



AGENSI INOVASI MALAYSIA

INNOVATING MALAYSIA

A Joint Effort by
MOSTI & AIM

NATIONAL INNOVATION POLICY

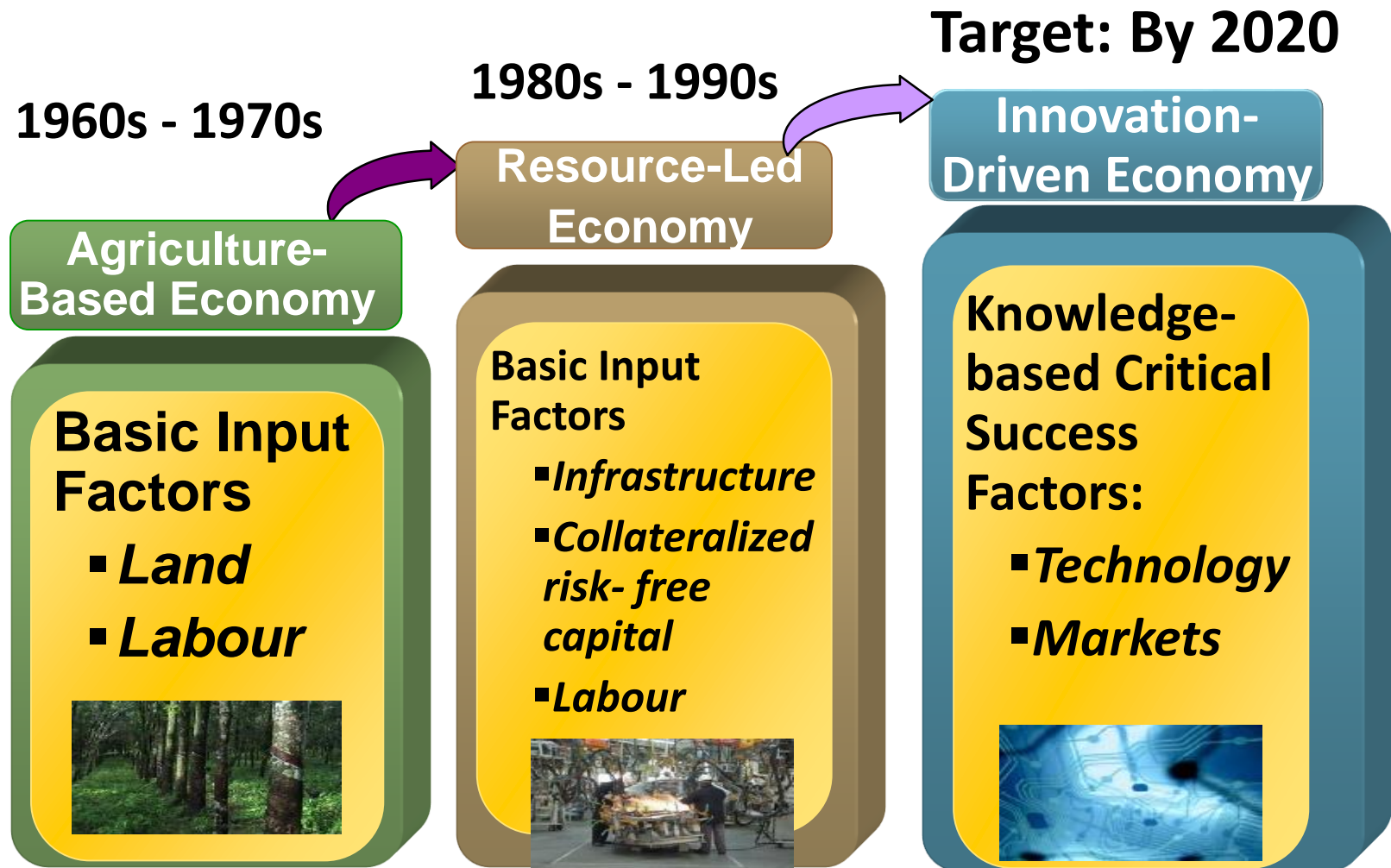
Biotechnology for Wealth Creation and Social Well-being

Long term goals – going global



**By 2020 Malaysia will be a global player in
biotechnology & will generate at least 20 global
Malaysian companies**

Malaysia moving toward innovation-led economy, driven by knowledge, creativity, technology & innovation



Continuous improvement

Science in the nation has reached a crossroad and new strategies are needed

Injecting new vigour in nation's science agenda

MAKING TWO INITIATIVES WORK:

Science in the nation has reached a crossroads and new strategies are needed

SCIENCE is important in nation-building. Not many would dispute that. A recent discourse on the future of science at the academy, which brought together two members of parliament and an ex-deputy minister, was unanimous on this.

The panel even went as far as articulating the need to urgently establish a parliamentary standing committee to monitor and debate on the state of science in the country.

In the United States, the President of the US National Academy of Sciences briefs the US Congress on the state of science every year. The reason why the US Academy of Sciences is given the task is because it is independent and can, therefore, report objectively.

Likewise, if Malaysia is to have a parliamentary standing committee, the academy's president is the right person to report to the committee.

Many sectors have benefited from the country's past investments in science. These include plantation, agriculture, electric, electronics and to some extent, construction.

Oil palm and rubber would not be where they are today without the prudent investment in science. The same goes for the information communication technology and electronics sectors.

pllicate the need to have the right talent in the coming years.

The demands on science have also changed. The years ahead would witness the emergence of new sciences, such as nanotechnology, biogenetics and sustainability, just to name a few.

The impact of climate change will also be felt more in the coming years. Though spending by government has been on the rise, the same cannot be said for industry.

Getting industry to invest more in science continues to be a challenge.

In developed economies, it is not uncommon to see industry bearing almost 80 per cent of the country's spending on research and development (R&D).

We would not be wrong if we say that science in the country has reached a crossroads. New strategies are needed.



Dr Ahmad Ibrahim
is fellow of the
Academy of
Sciences Malaysia

S2A has three thrusts: Science for Industry, Science for Wellbeing and Science for Governance.

Science for Industry essentially aims to motivate industry to invest more in research and innovation. In developed economies, more than 70 per cent of research funding is borne by industry.

This is especially true for applied research, or research closer to the market. It is the opposite here. Most of the funding comes from government.

Science for Wellbeing covers the investment in science for the public good. These include the science needed to resolve issues on the environment, climate change, public health and the like.

Science for Governance necessitates more transparency and accountability in the allocation of resources for science. After all, science is an expensive investment.

S2A very much reflects the new Science, Technology and Innovation (STI) Policy anchored by the

Energising Industry; Governance; Promotion; and, International Linkages.

What is needed now is how to translate the two initiatives into action. Over the years, effective implementation of policies has always been the sore point. The monitoring mandate has always been weak.

What we need is a robust institutional framework to drive the efficient delivery of both initiatives. To get the best out of both plans, S2A and the STI Policy must converge. This is where the National Science and Research Council should be given the muscle to act.

The long awaited Science Act must be concluded soon. The Act will hopefully provide more teeth to a new institutional framework of science governance.

The new commitment shown by the government should pave the way for a refreshed mood on the positive future of science.

New institutions/units established to provide financial support



National Committees Headed by Cabinet Members

Committee	Chairperson
Innovation Eco-System Committees	
1. Innovation Skills	Dato Seri Mohamed Khaled Nordin
2 Intellectual Properties	Dato Seri Ismail Sabri Yaakob
3 Investment (Public Fund)	Datuk Seri Panglima Dr Maximus Johnity Ongkili
4 Innovation Megatrend	Prof Emeritus Tan Seri Dato Lim Kok Wing
Wealth Creation Committees	
1. Innovation Impact Projects	Dato Mustapa Mohamed
2. Investment (Equity)	Yan Sri Nor Mohamed Yakcop

Requirements for Innovation

Political Commitment
& support of national
authorities

CHINA'S TUMULTUOUS CENTURY

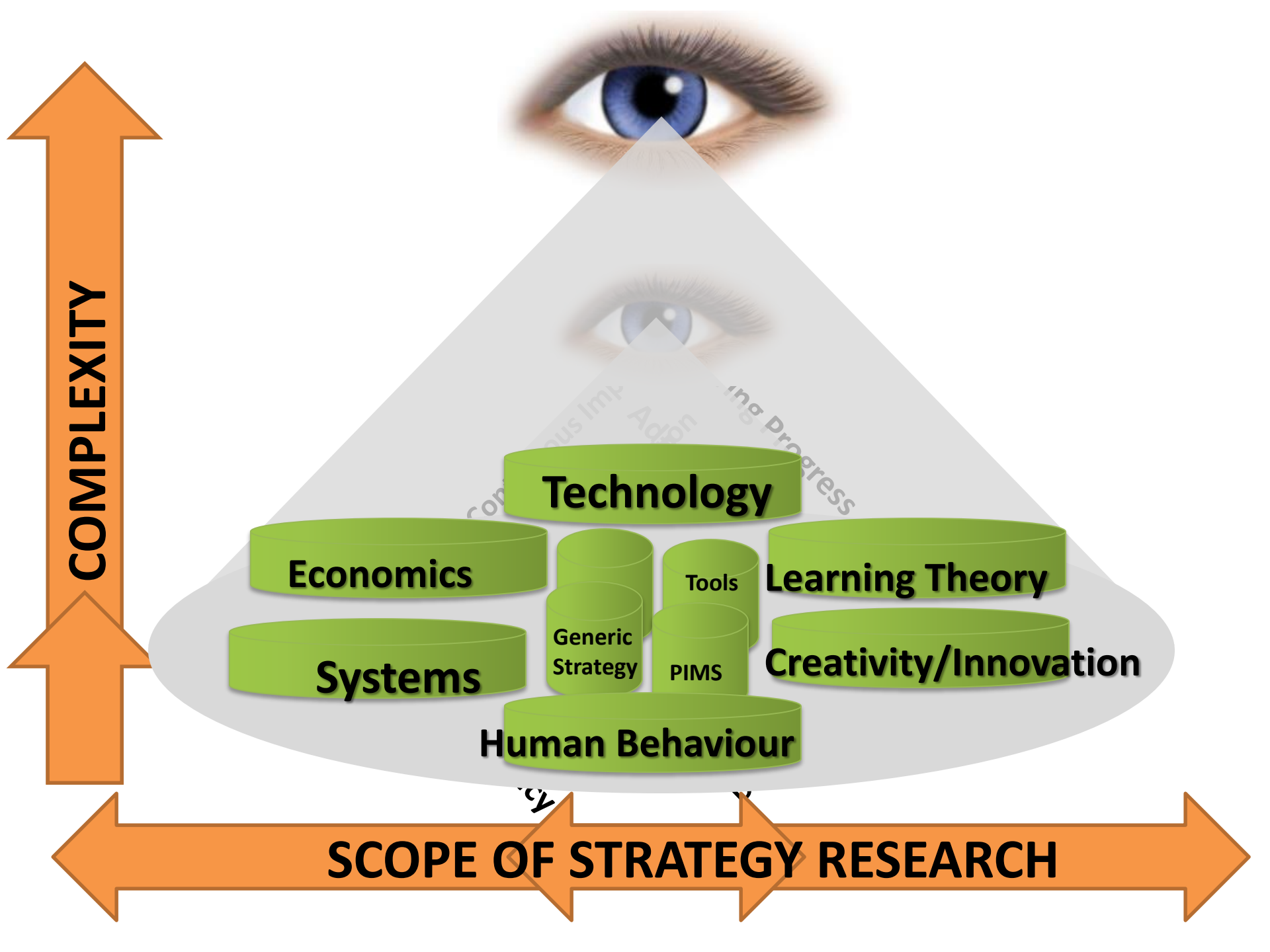
TIME



Master Planner

Who Cares What the West
Thinks? Mahathir Mohamad is
Rebuilding Malaysia His Way





COMPLEXITY

Technology

Economics

Learning Theory

Systems

Generic Strategy

PIMS

Tools

Creativity/Innovation

Human Behaviour

SCOPE OF STRATEGY RESEARCH



Public Service – **TOGETHER WE TRANSFORM**



Think out of the box

By **TEH ENG HOCK**
 enghock@thestar.com.my

The Civil Service needs to focus on innovation and creativity in today's competitive environment in order to change the public sector transformation.

Embracing innovation and creativity is key to successfully supporting the four pillars of the Government, namely the iMalaysia concept, the Government Transformation Programme, New Economic Model and the 10th Malaysian Plan.

Government agencies need to prioritise efforts in introducing innovation to all aspects, including management and service delivery to people and clients.

Innovation, coupled with proper planning, will help the country achieve its objective of being a high-income nation within a short period of time.

Prime Minister Datuk Seri Mohd. Najib Tun Abdul Razak had emphasised that the Government would transform Malaysia through a holistic innovative process, ranging from innovative administration in the private and public sector, societal innovation, urban and rural innovation, and branding innovation.

Other fields singled out for innovation were education, healthcare, transportation and social security.

through pre-cursors such as the iMalaysia concept, National Key Result Areas (NKRAs), Key Performance Indicators (KPI), New Economic Model, and the establishment of Special Taskforce to Facilitate Business (PEMUDAH), Performance Management and Delivery Unit (PEMANDU) and the National Economic Advisory Council (NEAC).

This underlined the Government's commitment in bringing about total innovation to bring the country to the next economic level.

"If previously, Quality Control Circle (QCC) focused on solving problems pertaining to main issues within departments, today, Innovative and Creative Circle (ICC) has given space to the members of its organisation to be innovative and creative in producing new ideas, without having to wait for issues or problems to occur within the department.

"In accordance to that member of the organisation must be more sensitive, concern, and proactive within their respective working environment, in line with the aim to improve our service," said Najib

He said: "If once upon a time we succeeded in transforming the economy from agriculture to industrial based, now we are moving forward towards a new economic model based on innova-



Najib: 'I do not want the automation culture to become the lifestyle among the civil servants'

While the achievements of the civil service had been measured in terms of productivity in the past, he said the civil

Government agencies have been encouraged to create an environment that is conducive for creative thinking,



The Prime Minister's Innovation Award trophy

The agencies and departments must also raise awareness on the necessity of the innovative approach in service delivery. This can be done through campaigns, exhibitions, seminars, talks and contests.

Internally, each agency and department must set up a mechanism which encourages and gathers ideas from its staff. All suggestions must be received regardless if it brings about a big o

Innovative Nation



“To become an innovative Nation, we need a mental transformation in the Government, industry and the education sector. This is to shape the attitude of our future generations. This is our mission.”

YAB Dato' Sri Mohd Najib bin Tun Abdul Razak
Prime Minister Malaysia

LAWS OF MALAYSIA**Act 718****AGENSI INOVASI MALAYSIA ACT 2010**

An Act to incorporate the Agensi Inovasi Malaysia, to stimulate and develop the innovation eco-system in Malaysia towards achieving Vision 2020, and to provide for matters connected and incidental thereto.

[]

ENACTED by the Parliament of Malaysia as follows:

Agency Innovation Malaysia



CONCEPT



RESEARCH &
DEVELOPMENT



PROTOTYPE
/ PILOT



COMMERCIA
-LIZATION



SCALE UP



SUSTAIN
GROWTH

Strengthen the Building Blocks of Innovation

- Build FutureSkills in the Education System, IHLs, the Private Sector and Government
- Nurture and Develop Intellectual Capital
- Creating a seamless funding pipeline for innovation

Leveraging on Innovation Enablers

- Utilizing multi-platform ICT technologies to engage the citizens
- Adopt open innovation collaboration between academia, industry, government and citizens
- Involve all levels of citizens in the nation's innovation agenda

World class innovative nation

- Develop world-class PRIs and COEs in niche areas
- Develop global companies with distinctive capabilities through innovation, leading to global penetration
- Encourage the Rakyat to out-perform themselves

*Creating a
culture of
Innovation*

Innovation - Inland Revenue Board wins PM Award

27 May 2010 The Star

THE STAR, THURSDAY 27 MAY 2010

Nation

thestar.com.my/news/nation

free seats
kok >N18

Illegal sand mining
angers folk >N29



Rep: We
need more
reports on
activities
>N6

RM1mil award for IRB

Reward could be used for bonus or training, says PM

KUALA LUMPUR: The Inland Revenue Board (IRB) has taken home a RM1mil incentive for winning the Prime Minister's Innovation Award.

The reward, said Prime Minister Datuk Seri Najib Tun Razak, could be used in any way deemed meaningful by the board – including for training purposes or to be given out as bonus.

Najib hoped the award would be a strong encouragement for the department – all the way from the head of department to the lowest level of staff – to want to perform even better.

The Prime Minister presented the award at a ceremony yesterday.

IRB chief executive officer Datuk Hasmah Abdullah said the department had always been negatively perceived by the public, but this would not dampen its determination to keep improving.

"Many people have the common perception that paying taxes is burdening. Our key to innovation is to make tax payment easy and we have done it successfully," she said after receiving the award from Najib.

Earlier in his speech, Najib said Malaysia had no choice but to be willing to embrace change in this globalised era. The public sector must be able to think out of the box and be creative

to bring about development.

"We need to engage new methodology and approach because other countries which were not our competitors before have changed and are competing against us," he said.

He added that the Government sector had taken a big leap when it introduced the National Key Result Areas and Key Performance Index to ensure that the country was not lagging behind when others were moving forward.

"There must be innovation in the government administration to ensure that its outcome will please and satisfy the *rakyat*," he said.

TS

Two

Feminine feminist

Miss Universe Malaysia 2010 Nadine Ann Thomas is a self-confessed feminist who is into make-up and looking pretty.

Biz

TM's backhaul rates too high

In Bhd says Telekom Malaysia backhaul charges are expensive and it is forced to build its own facilities.

ro

to move its headquarters Shah Alam soon. Meanwhile, were shocked to learn of

Income Tax filing done Online

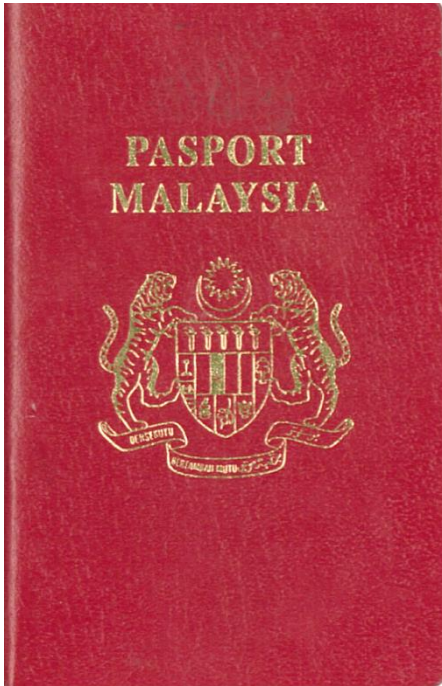


E-Filing LHDNM
Easy, simple & Safe

PENGESAHAN PENERIMAAN e-BE BAGI TAHUN TAKSIRAN 2011
ACKNOWLEDGEMENT RECEIPT e-BE FOR YEAR OF ASSESSMENT 2011

Nombor Siri <i>Serial Number</i>	BE 240174
Nama <i>Name</i>	PROF DR MOHAMED SHARIFF BIN MOHAMED DIN
No. Cukai Pendapatan <i>Income Tax No.</i>	SG 02184673010
No. KP Baru <i>New IC No.</i>	490314055093
Jumlah Pendapatan <i>Total Income</i>	RM 209,402
Pendapatan Bercukai <i>Chargeable Income</i>	RM 190,369
Jumlah Cukai Yang Dikenakan <i>Total Tax Charged</i>	RM 10,144.94

Renew passport

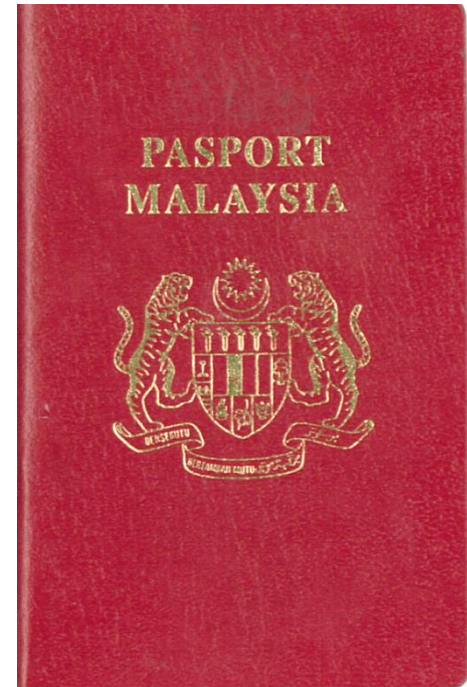


Deposit old passport



Renew passport

Thumb
print



1 hr

New passport ready

Passing immigration

Insert
passport



Passing immigration

Thumb
print

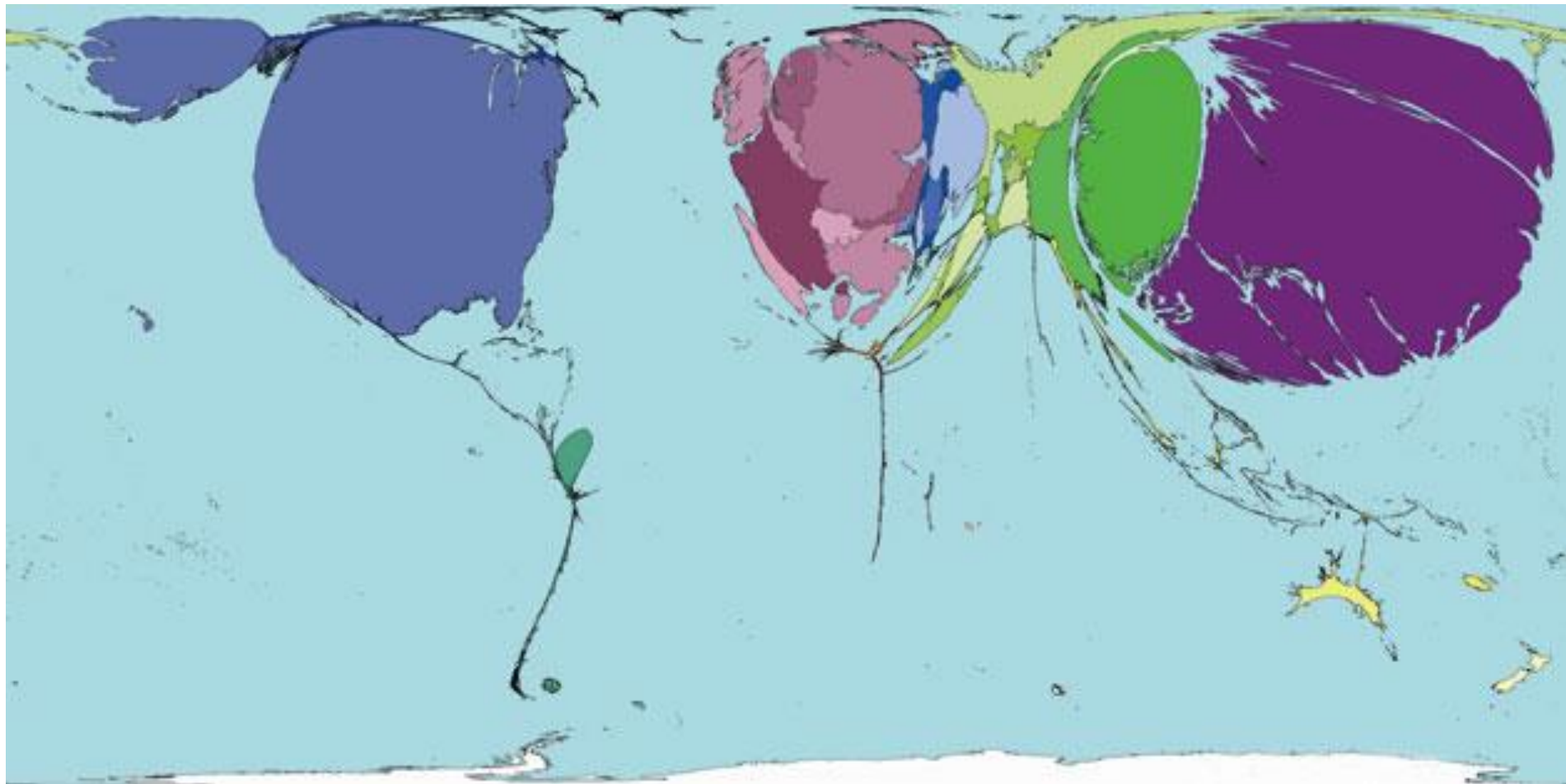
A person wearing a light blue and white long-sleeved shirt, blue jeans, and a black backpack is standing at an immigration checkpoint. They are using a thumbprint scanner on a grey machine. A yellow arrow points from a cyan box labeled 'Thumb print' to the scanner. The background shows other people and airport equipment.

Used since 2003

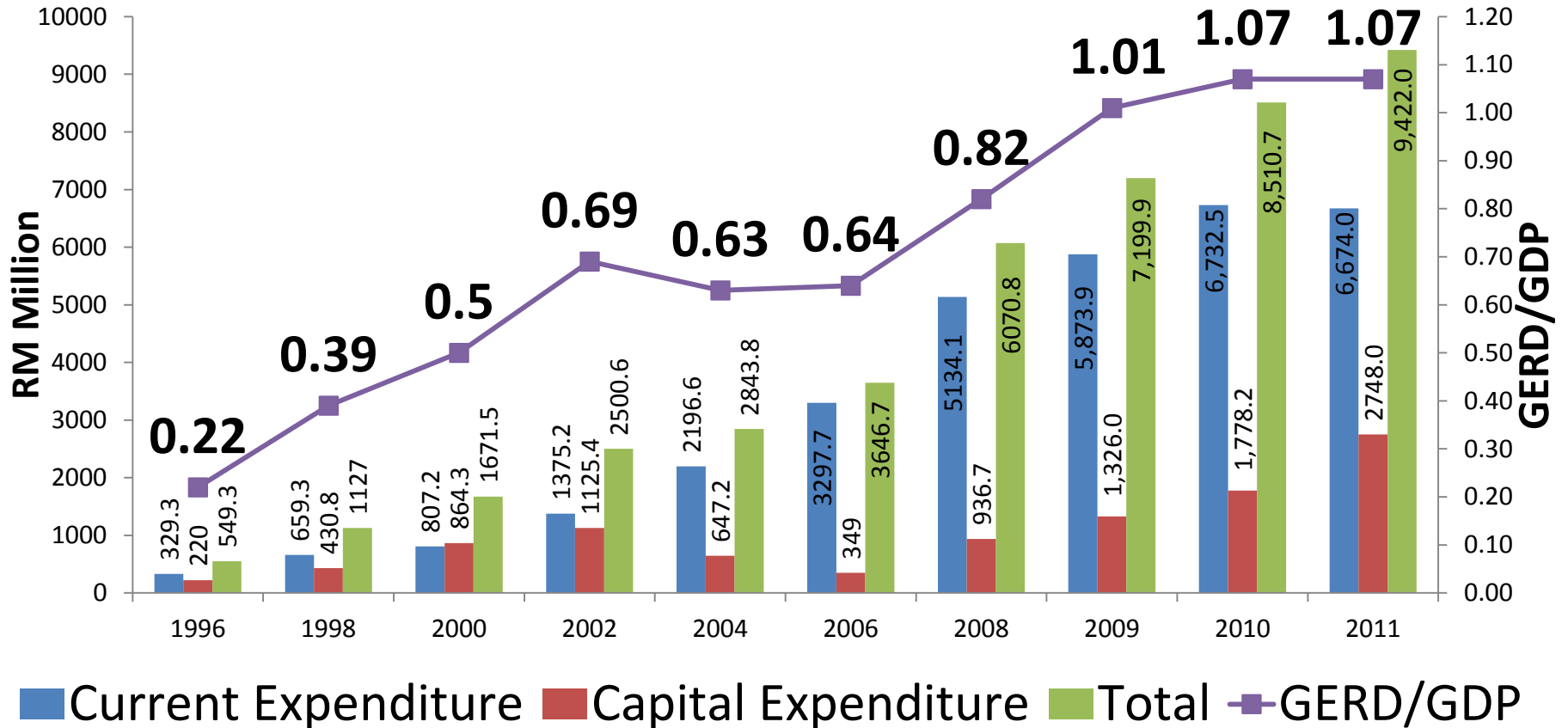
R&D Expenditure

Strong link between the growth in national economies and their corresponding R&D budgets

Cartogram - countries are distorted in proportion to No. of annual patents granted there. Japan & USA each accounts for roughly 1/3 of patents worldwide.



Gross expenditure on R&D (GERD) 1996-2011



Source: MASTIC(2012)

TTO Practices

- ❑ Apply **best practices & structured innovation methodology**
- ❑ Create **healthy relationship between private sector & institution**



Strengthen building blocks of innovation



**Build
future
skills
today**

TTO & Graduates – must have:

- Innovation methodology

The Workforce must:

- ❑ Master Innovation Methodology for creating new products & services



UPM
UNIVERSITI PUTRA MALAYSIA
SERI WUJUD BANGSANYA



MTDC

UPM - MTDC TECHNOLOGY CENTRE III



Poultry vaccines production



QC

GMP

Lessons from successful nations

Top innovation country

Switzerland No. 1 in 2013 Global Innovation Index



Global Innovation Index 2013:
US rejoins five most-innovative nations, Switzerland keeps top spot



Lessons from successful countries

1st :

- Well-constructed innovation policies/strategies**
- Effective implementation**

Successfully able to influence &
to **increase their innovation capacity &**
competitiveness

Lessons from successful countries

2nd

Countries at frontiers of innovation

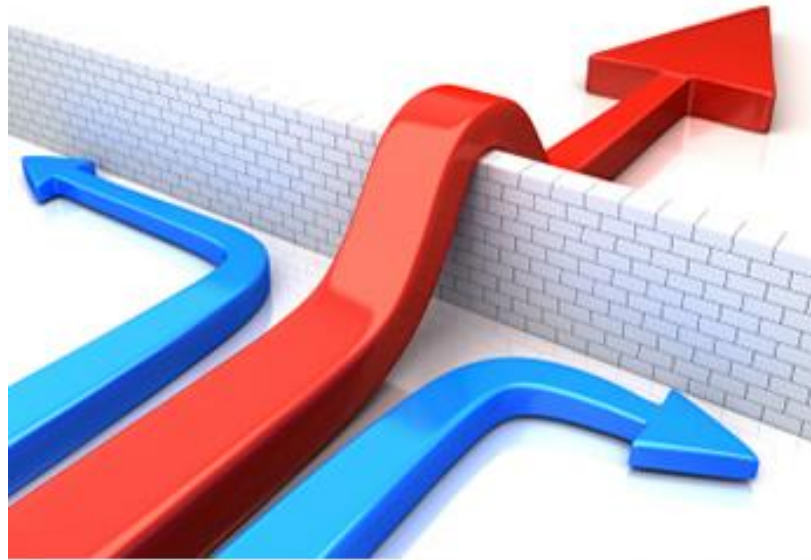
shift dynamically - over the last 25 years

Top innovative countries

Common in 26 nations

- **Inventor** – high academic achievement & high-tech advantage
- **Transformer** – attract inventive firms from other countries because of production & marketing expertise
- **Financier** - high R&D spend per capita & availability of local & foreign venture capital

Challenges



Policy/Strategy formulation

Crystal clear strategy

**Vague policy/strategy will limit
implementation**

IP policy/strategy

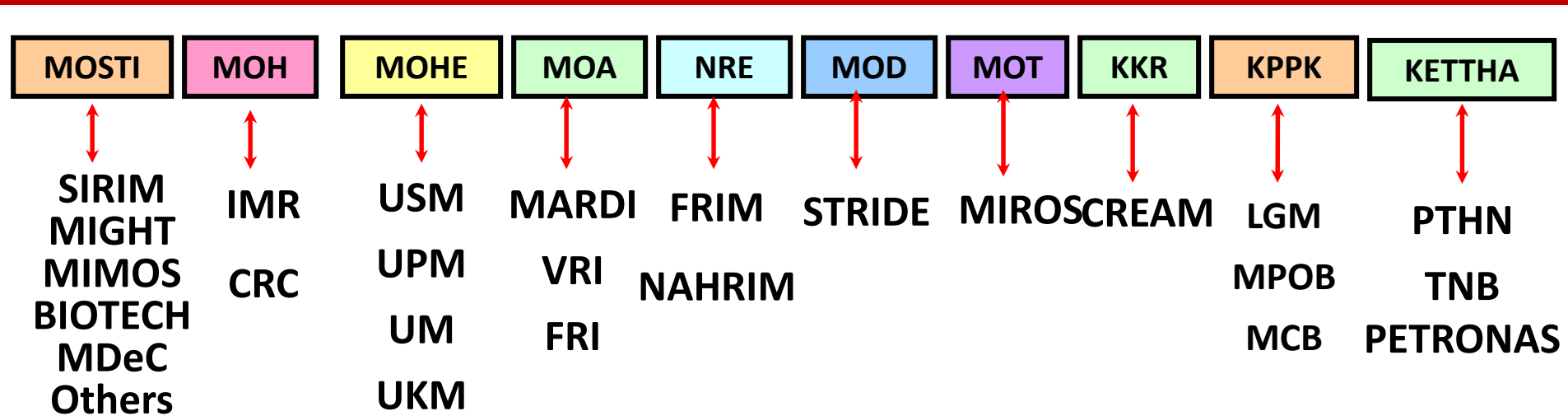
Spells out

- **How best to develop the talent base for an innovation system**

No single policy/strategy works for all countries

- ❑ Each country is different & need to crafts its own policy/strategy
- ❑ Understand comparative advantages & design innovation policies
- ❑ Exploit advantages & raise the odds of success

Fragmented research activities within ministries



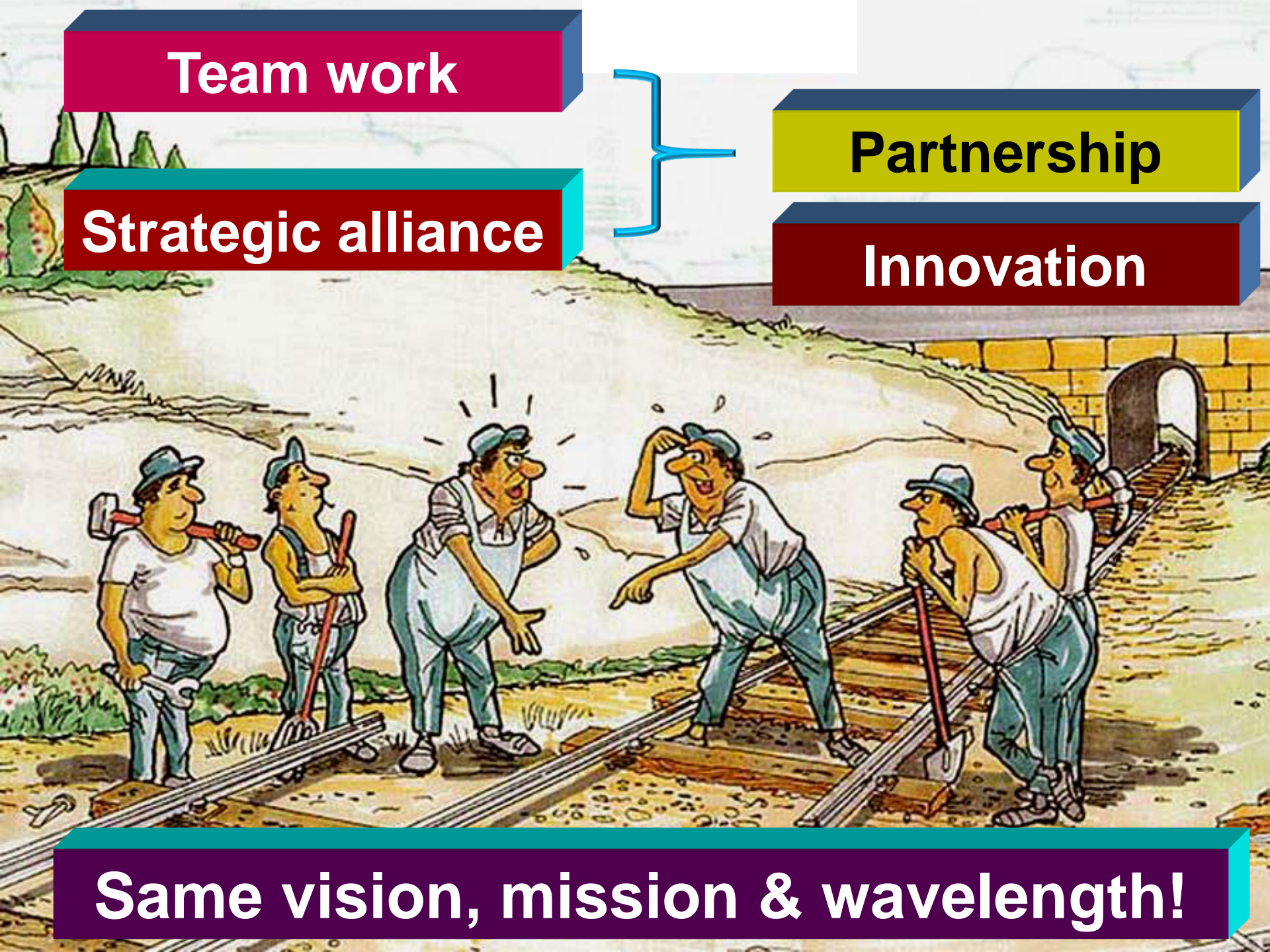
- Fragmented & working in silo
- No single agency to collaborate R&D
- Low No. of commercialized research output
- Weak linkages between RI & industry
- No centralised database on research activities
- R&D allocation is not optimally utilised

Team work

Strategic alliance

Partnership

Innovation



Same vision, mission & wavelength!

Talent Pool

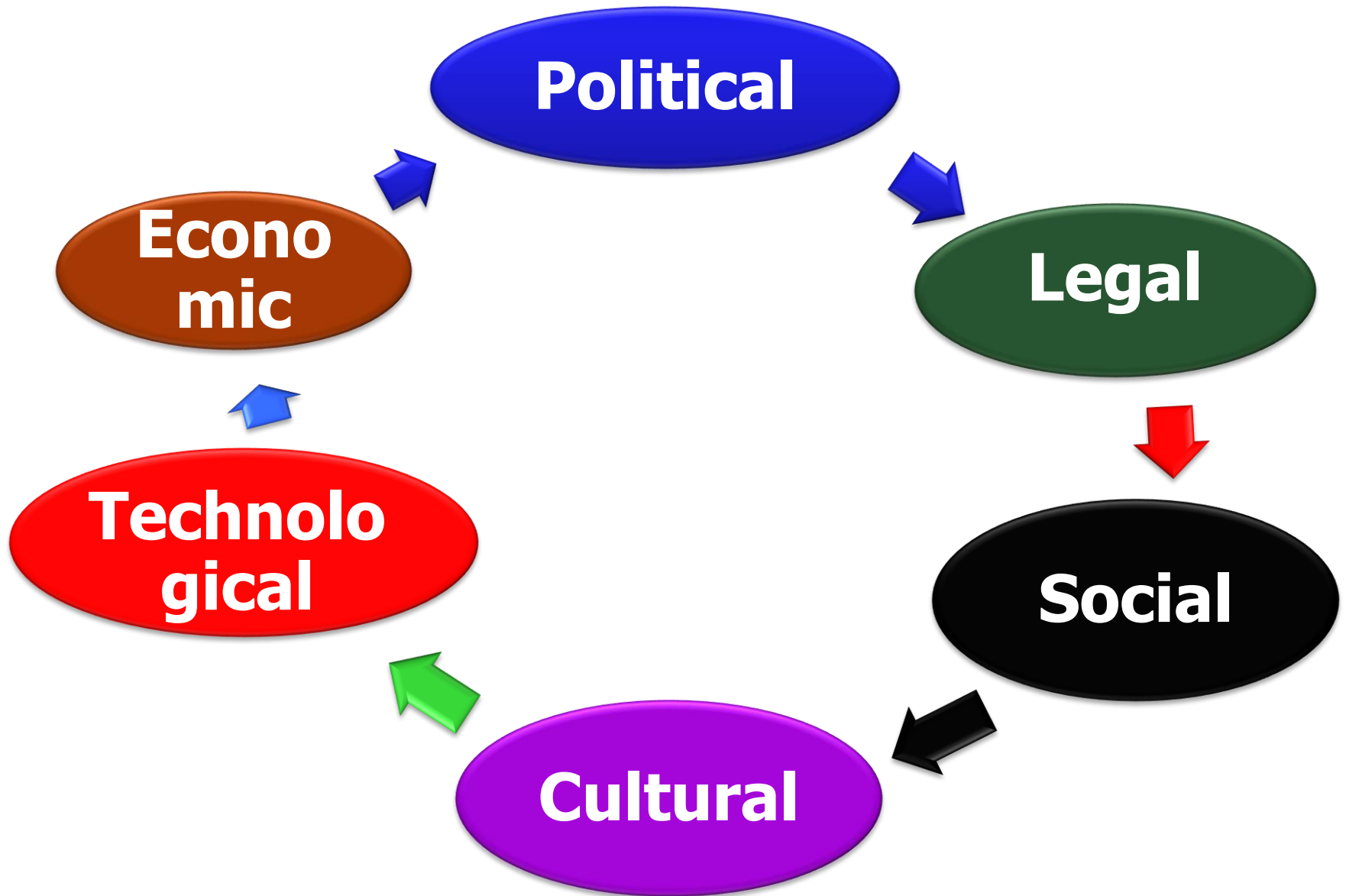
- Adequate No. of skilled human capital
- Continuously enlarge talent pool
- Researchers need to be:

International players

Exploiters of the world market

Contributors to world's agenda

Barriers



Awareness

- ❖ **Keep communications open so that every one know what's going on**
- ❖ **Involve policy makers & implementing agencies in awareness campaigns**
- ❖ **Awareness campaigns – Phase I**
- ❖ **Awareness campaigns – Phase II, III...**

Nation's success

- Development & integration of bold policies**
- Restructuring tax & regulatory systems to become more competitive**
- Increase support for R&D**
- Introduce IP into education programs**
- Many other pro-innovation steps**

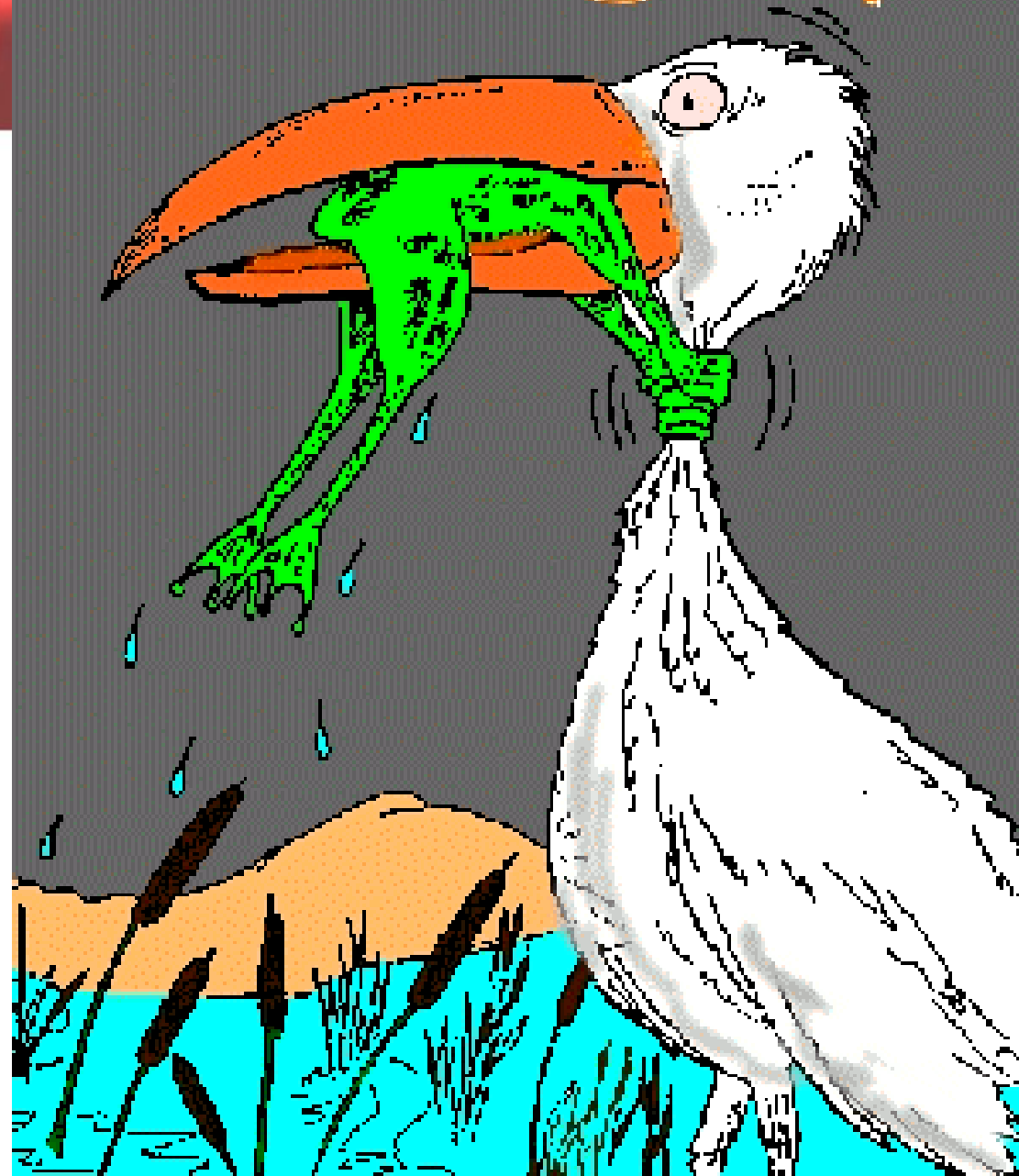
No quick fixes

- **Innovation is still new & evolving**
- **Innovation culture takes decades to accomplish**
- **Short-term results difficult to demonstrate & to quantify**
- **Policy makers must recognise these facts & build flexible programs that takes time to mature & evolve**

**Nothing
is
impossible!**

**You can
do it!**

Never ever give up!



Merci bien

