



WORLD
SCIENCE
FORUM
RIO DE JANEIRO

PROTOCOLS...



I APPRECIATE THE INVITATION

WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD
SCIENCE
FORUM
RIO DE JANEIRO



Engr Umar B. Bindir PhD. ©
DIRECTOR GENERAL/CEO
(ubindir@yahoo.com)



WORLD SCIENCE FORUM, BRAZIL 2013

THE NIGERIAN INNOVATION OFFICE





WORLD
SCIENCE
FORUM
RIO DE JANEIRO



Nigeria
Good People Great Nation



**THE FUNDAMENTAL ROLES OF SCIENCE IN
INNOVATION
(For Global Sustainable Development)**

A PAPER PRESENTATION AT THE WORLD SCIENCE FORUM 2013
Rio de Janeiro, Brazil from 24 through 27 November 2013

24TH – 27TH NOVEMBER 2013

WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013

INNOVATION IS AN OUTCOME OF A
“DYNAMIC” DEPLOYMENT OF
KNOWLEDGE, SKILLS AND KNOWHOW TO
COMPETITIVELY SUSTAIN SOCIO-
ECONOMIC RELEVANCE OVER A GIVEN
PERIOD IN A GIVEN ENVIRONMENT

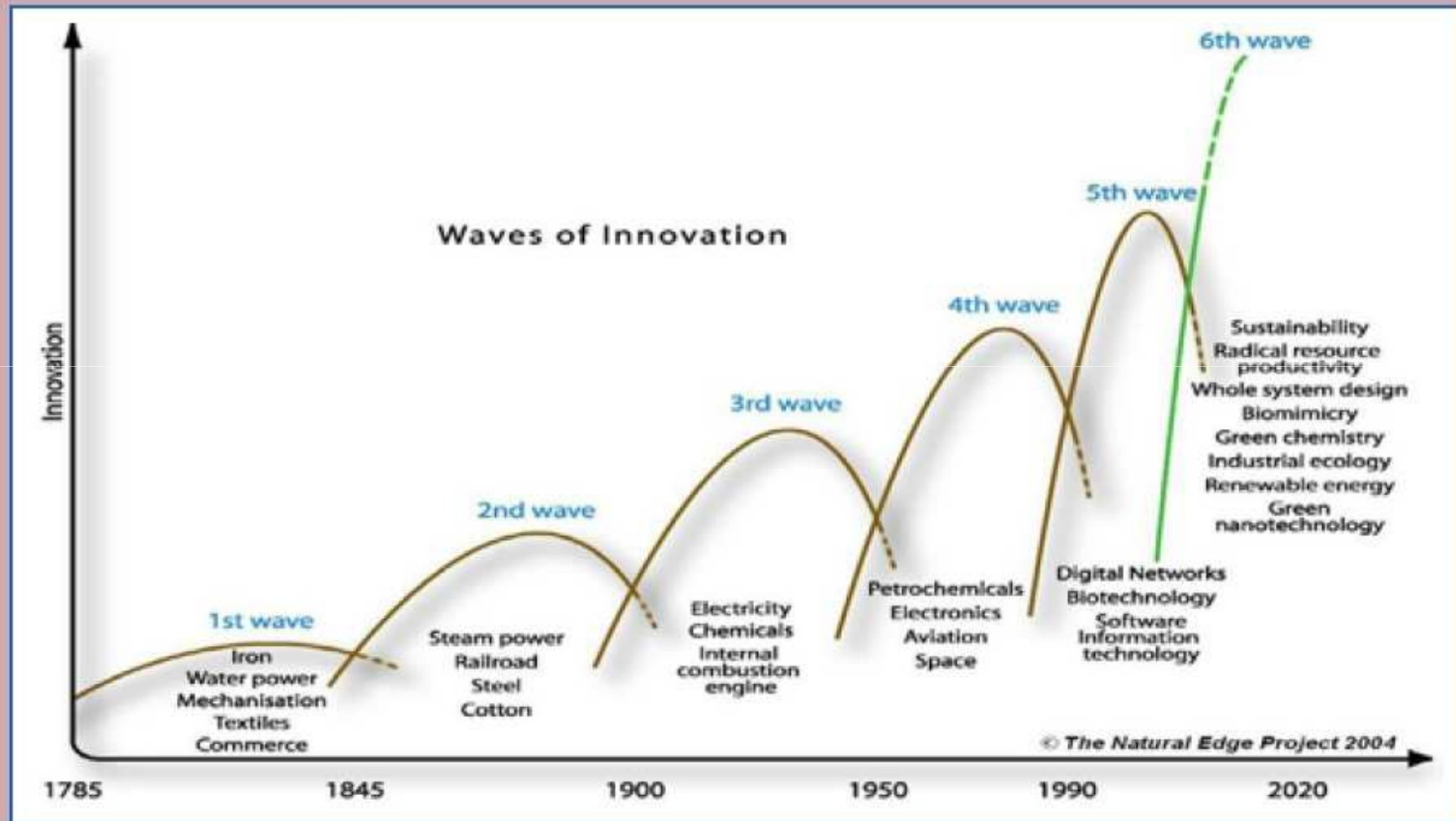
Dr U. B. Bindir, 2013

SUSTAINABLE DEVELOPMENT VALUE CHAIN

- Absolute poverty is **totally eradicated**
- Every man, woman, and child in the Country should **have access, not just to basic minimum needs, but to all the opportunities** to lead a happy, secured and fulfilling life
- Country **emerges** as a **knowledge and a learning society** built on values of *Passion, Participation, Perseverance and Play*

SUSTAINABLE DEVELOPMENT VALUE CHAIN

THE EVOLUTION OF SCIENCE, TECHNOLOGY & INNOVATION (STI)



SOURCE: Hargroves, K. and Smith, M.H. (2005) *The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century*, Earthscan, London.

WORLD SCIENCE FORUM, BRAZIL 2013

SUSTAINABLE DEVELOPMENT VALUE CHAIN

-
- **DEVELOPED**
 - **EMERGING/FATIQUED**
 - *DEVELOPING*
 - *LEAST DEVELOPED*
 - *UNDERDEVELOPING*
 - *UNDERDEVELOPED*
- 1ST, 2ND
- 3RD

“World 3 (the third world) refers to those countries – Bangladesh and Nigeria are examples – that are in severe straits *with no clear path to a positive future*”

*Source: 21st Century Technologies: Promises and Perils of a Dynamic Future, **OECD 1998**, Ch. 2, page 34*



**“WE CAN’T SOLVE
PROBLEMS BY USING THE
SAME KIND OF THINKING
USED WHEN WE CREATED
THEM”**

ALBERT EINSTEIN (German Born American Physicist 1879 – 1955)

THE CLEAR CALL FOR CHANGE OF STRATEGY

WORLD SCIENCE FORUM, BRAZIL 2013

DESIRED DEVELOPMENT??

- **MODERNISED** ECONOMY
- ***DYNAMIC POPULATION***
- WELL FOCUSED **PRODUCTIVITY**
- GLOBALLY **COMPETITIVE**
- **CREDIBLE** GLOBAL VISIBILITY
- **VIABLE KNOWLEDGE BASED ECONOMY**
- **etc**

DESIRED DEVELOPMENT...

ALL

FIRMLY DEPENDS ON THE VIBRANCE AND
CONNECTIVITY

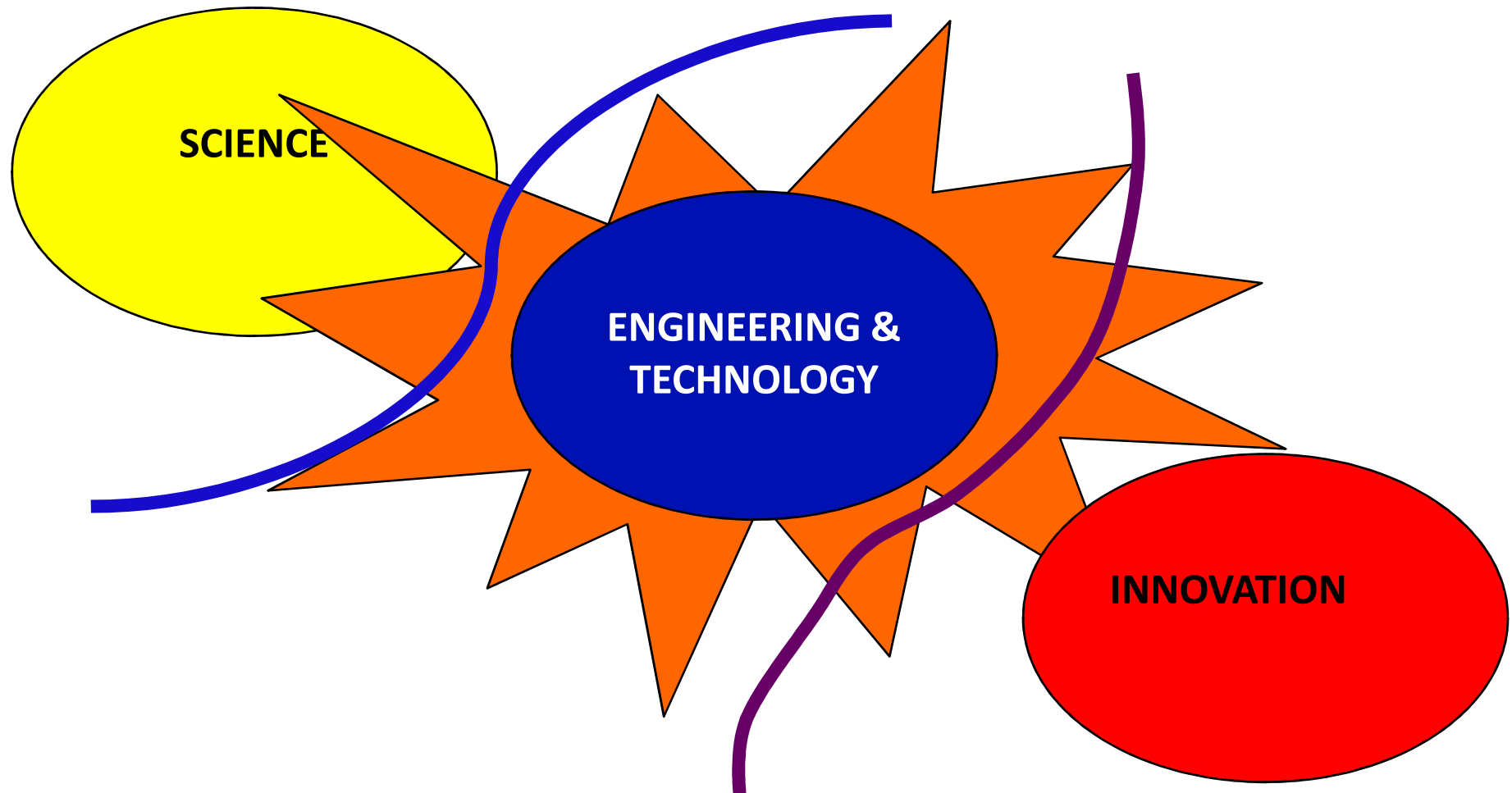
FROM SCIENCE TO INNOVATION

“THIS IS THE MASTER KEY”

EFFECTIVE SYSTEM RECIPE

- **STRATEGIC TECHNOLOGY ACQUISITION**
- **SOUND TECHNICAL EDUCATION**
- **EXCELLENT TECHNOLOGICAL R&D**
- **VIABLE TECHNOLOGY TRANSFER STRATEGY**

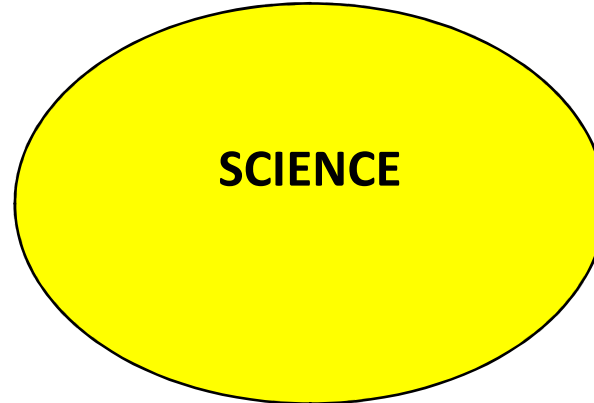
SCIENCE TO INNOVATION VALUE CHAIN



WORLD SCIENCE FORUM, BRAZIL 2013

RESEARCH

FACTS AND FIGURES (**Research**)



- SPECIALISTS (**SCIENTISTS**)
- HIGHLY TRAINED AND QUALIFIED
- EXPENSIVE TOOLS AND FACILITIES
- CLEAR KNOWLEDGE, DISCOVERIES
- CONCEPTS, DOCUMENTS, DATA AND STATISTICS
- **PUBLICATIONS/PhDs (PROMOTION ?)**
- **RESEARCH INFRASTRUCTURE (Labs & Equipment)**
- **CITATION/ACADEMIC PARTNERSHIPS...**
- **RELEVANCE?**

STI...

HIGH LEVEL, QUALITY KNOWLEDGE (S)

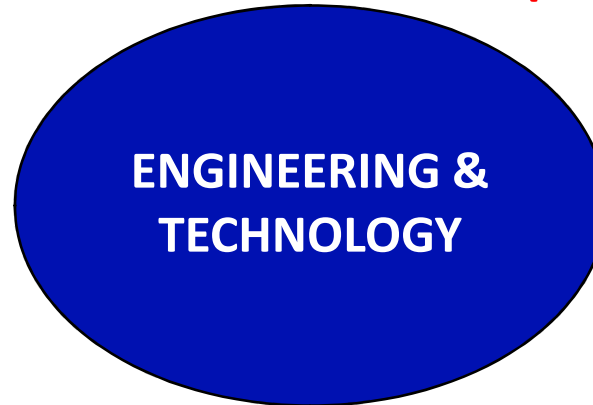


DISCOVERIES, KNOWLEDGE, PUBLICATIONS and PhDs

???.
●●●

DEVELOPMENT (T)

POSSIBILITIES AND APPLICATIONS (Development)



- TECHNOCRATS (**ENGINEERS, ARTISANS.... OTHERS**)
- HIGHLY SKILLED IN **TRANSFORMING KNOWLEDGE**
- PROOF OF CONCEPTS ON PRODUCTS AND PROCESSES
- PRODUCTION PROCESSES INFRASTRUCTURE
- PROTOTYPES AND PILOT PLANTS
- TECHNOLOGY SERVICES
- **RELEVANCE ?**

STI...

HIGH LEVEL, QUALITY KNOWLEDGE (S)



KNOWLEDGE, PUBLICATIONS AND PhDs



INTELLECTUAL PROPERTY-IP (T)

???
●●●

STI ...

HIGH LEVEL, QUALITY KNOWLEDGE (S)



KNOWLEDGE, PUBLICATIONS AND PhDs



INTELLECTUAL PROPERTY-IP (T)

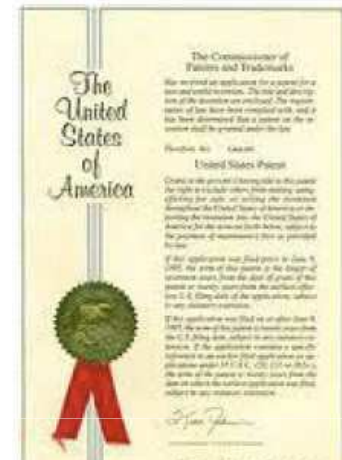


LEGAL OWNERSHIP (R) (IPR)

TARGETED OUTPUTS....

1. INDUSTRIAL PROPERTY RIGHTS

- PATENTS PAT.#
- TRADE MARKS TM
- INDUSTRIAL DESIGN [®]
- TRADE SECRETS
- HIGH LEVEL KNOW HOW
 - TECHNICAL SKILLS
 - MANAGERIAL SKILLS
- etc



TARGETED OUTPUTS....contd

2. COPYRIGHTS ©

- CREATIVE EXPRESSION
- LITERARY
- MUSIC
- SOFTWARE
- DATABASES
- PLANT VARIETIES
- GEOGRAPHICAL INDICATORS
- TRADITIONAL KNOWLEDGE
- LAYOUT DESIGN
- etc

THIS IS KNOWLEDGE ECONOMY

SETI ...

HIGH LEVEL, QUALITY KNOWLEDGE (S)



KNOWLEDGE, PUBLICATIONS AND PhDs



INTELLECTUAL PROPERTY-IP (T)



LEGAL OWNERSHIP (R)

(IPR)



LIABILITIES

SETI ...

HIGH LEVEL, QUALITY KNOWLEDGE (S)



KNOWLEDGE, PUBLICATIONS AND PhDs



INTELLECTUAL PROPERTY-IP (T)



LEGAL OWNERSHIP (R)

(IPR)

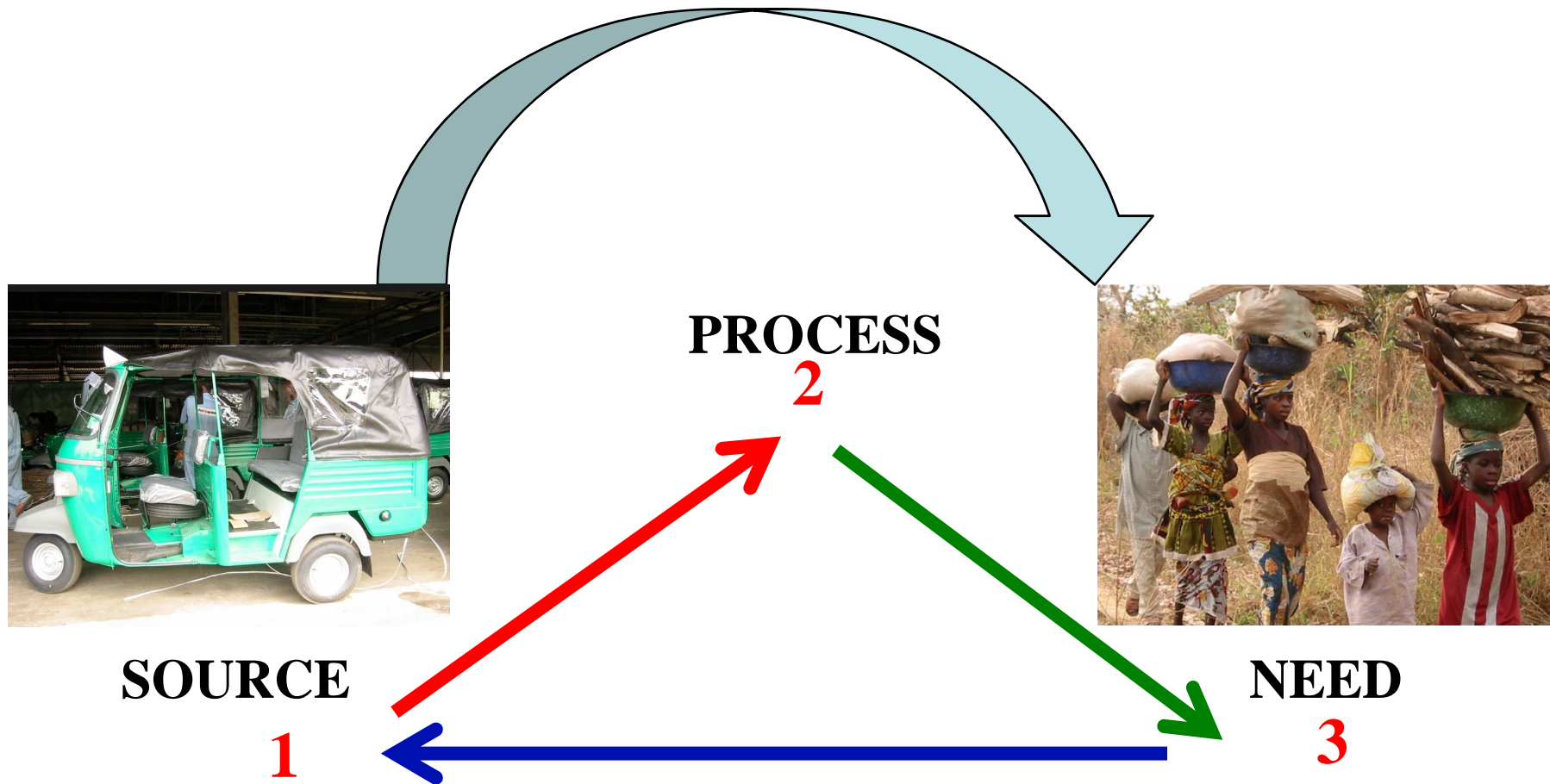


LIABILITIES

ASSETS (TT)

WORLD SCIENCE FORUM, BRAZIL 2013

TECHNOLOGY (IPR) TRANSFER (Commercialisation Skills)

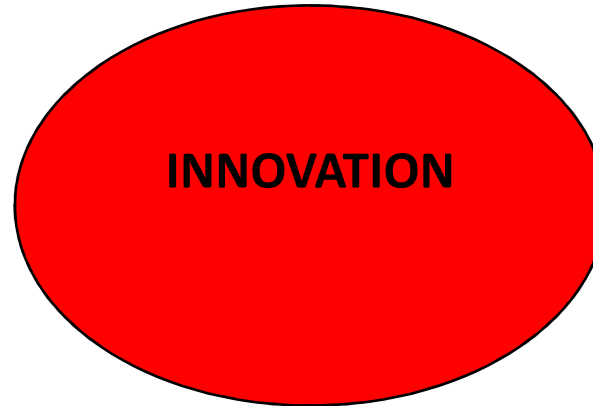


TRANSFER PLATFORMS??

- **SELF ACTUALISE**
- **OUTRIGHT SALE/PURCHASE**
- **LICENSING**
- **JOINT VENTURE**
- **FRANCHISES**
- **FDIs**
- **GIFTS, AID/GRANT/DONATIONS**
- **BI/MULTI LATERAL AGREEMENTS**
- **etc**

INNOVATION (I)

SOLUTIONS AND PRODUCTS



- **EVERYBODY..... ARTISANS**
- **FEASIBILITY AND FINANCING**
- **IP MANAGEMENT & LICENSING**
- **PRODUCTION, MARKETING, BRANDING....**
- **BUSINESS PLANNING/MANAGEMENT**
- **PRODUCTS**
- **PROCESSES**
- **KNOW-HOW SERVICES (Consultancy etc)**
- **RELEVANCE?**

THIS IS KNOWLEDGE-BASED ECONOMY

Trade marks:

- Made by "Nokia"
- Product "N95"
- Software "Symbian", "Java"

Patents:

- Data-processing methods
- Semiconductor circuits
- Chemical compounds

Copyrights:

- Software code
- Instruction manual
- Ringtone



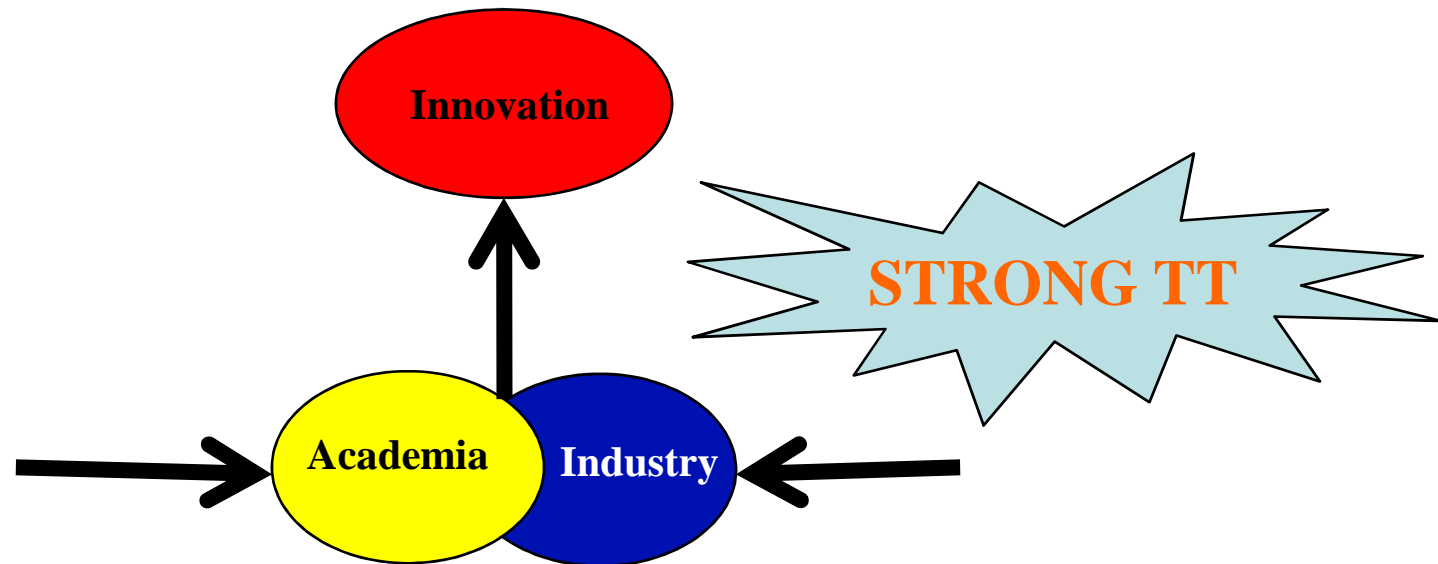
Trade secrets:

?

Industrial Designs (some of them registered):

- Form of overall phone
- Arrangement of buttons in oval shape
- Three-dimensional wave form of buttons

SUMMARY OF S TO I DYNAMICS



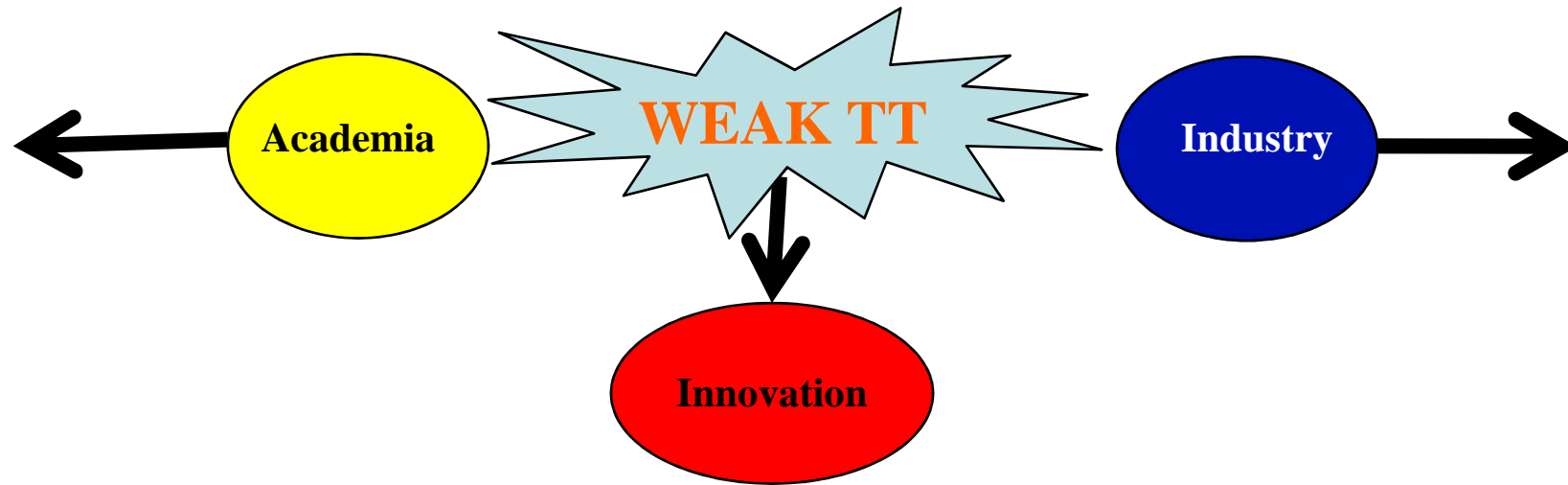
(A) ACTIVE/DOMESTIC/INTERNAL

- UNIVERSITIES
- POLYTECHNICS
- RESEARCH INSTITUTES
- **INDUSTRIES**

SMEs, JOBS, INDUSTRIALISATION....

DEVELOPED & EMERGING COUNTRIES

WORLD SCIENCE FORUM, BRAZIL 2013



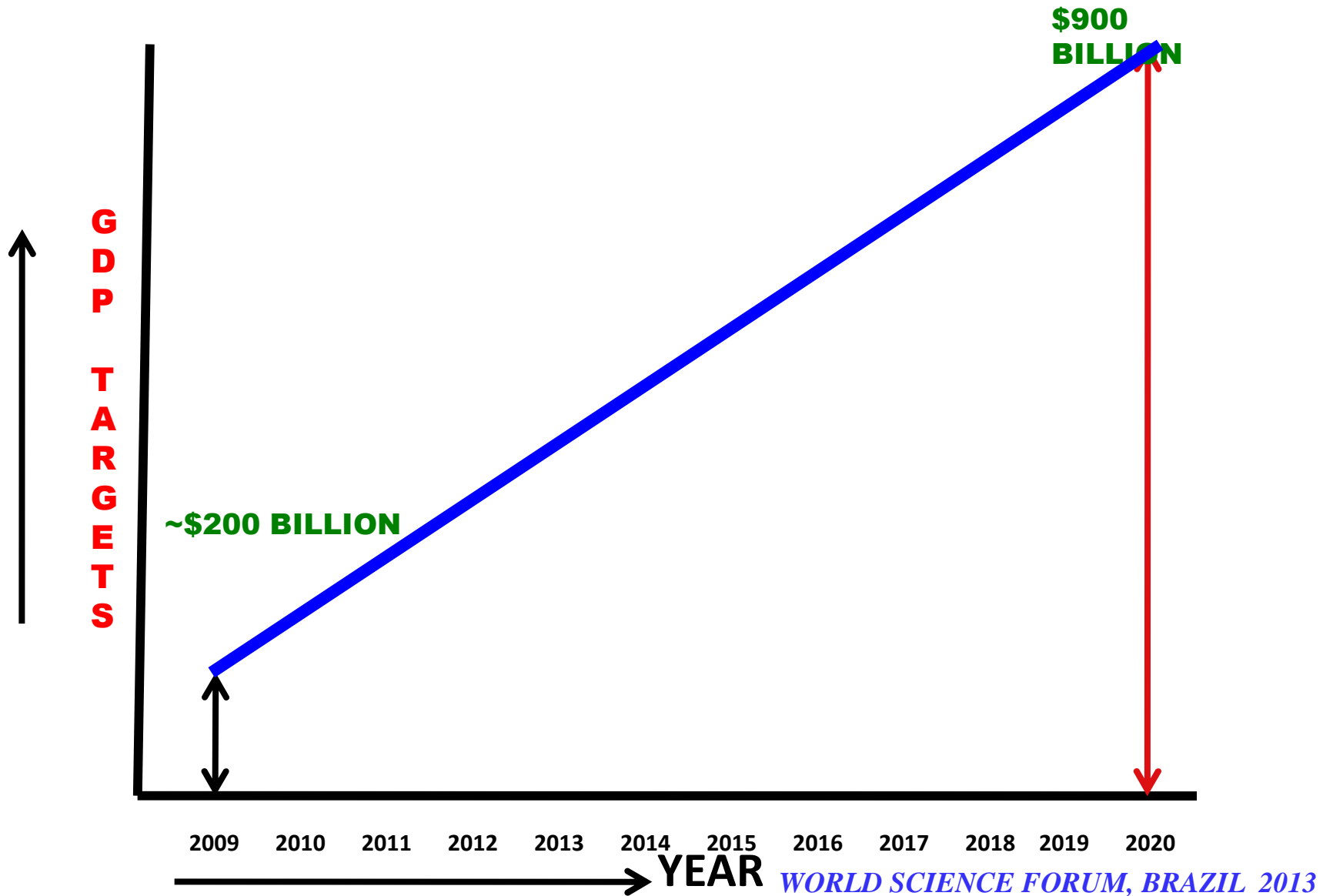
(B) PASSIVE/FOREIGN/EXTERNAL/
– FOREIGN SOURCES

DEVELOPING/UNDER-DEVELOPING COUNTRIES

**CURRENT NIGERIAN NATIONAL
DEVELOPMENT & GROWTH STRATEGY**

**THE TRANSFORMATION AGENDA
and
THE ATTAINEMENT OF VISION 20-2020**

THE 20-2020 MIRACLE? "GDP"



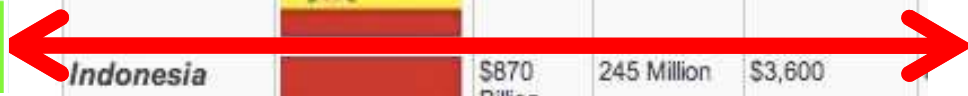


World's Top Economies

		GDP	Population	GDP per capita
<i>World</i>		\$61 Trillion	6.5 Billion	\$9,200 WAG
<i>US</i>		\$12 Trillion	300 Million	\$41,600
<i>China</i>		\$8.9 Trillion	1.3 Billion	\$6,800
<i>Japan</i>		\$4 Trillion	127 Million	\$31,600
<i>India</i>		\$3.7 Trillion	1.1 Billion	\$3,700
<i>Germany</i>		\$2.5 Trillion	82 Million	\$30,100
<i>United Kingdom</i>		\$1.8 Trillion	61 Million	\$30,100
<i>France</i>		\$1.8 Trillion	61 Million	\$29,600
<i>Italy</i>		\$1.7 Trillion	58 Million	\$28,700
<i>Russia</i>		\$1.6 Trillion	143 Million	\$11,000
<i>Brazil</i>		\$1.5 Trillion	188 Million	\$8,300



		GDP	Population	GDP per capita
<i>Canada</i>		\$1.1 Trillion	33 Million	\$33,900
<i>South Korea</i>		\$1.1 Trillion	49 Million	\$22,600
<i>Mexico</i>		\$1.0 Trillion	108 Million	\$10,000
<i>Spain</i>		\$1.0 Trillion	40 Million	\$25,600
<i>Indonesia</i>		\$870 Billion	245 Million	\$3,600
<i>Australia</i>		\$636 Billion	20 Million	\$31,600
<i>Taiwan</i>		\$630 Billion	23 Million	\$27,500
<i>Turkey</i>		\$585 Billion	70 Million	\$8,400
<i>Iran</i>		\$570 Billion	69 Million	\$8,400



KEY ATTRIBUTES

- National SETI Policy (practical and implementable) on moving **ALL SECTORS**)
- Vibrant Science, Technology and **Innovation** (STI) system
- Institutional **Systems** of Innovation (**NSI**)
- Sustained Research and Development (R&D) **Investment**
- **Raw Material** Endowments and downstream value addition
- Prioritised Sectoral Technology Acquisition **Focus** and **Mentor**
- Innovative, Deliberate and Intense Deployment of **ICT**
- Viable Research - Industry Linkage models
- Strong Intellectual Property (**IP**) **Management**

S TO I ANALYSIS
IN
NIGERIA

WORLD SCIENCE FORUM, BRAZIL 2013

KNOWLEDGE INFRASTRUCTURE

- **129 Universities (40 F, 39 S, 50 P)**
- **125 Mono-Polytechnics, 98 COE**
- **Over 300 Research Institutions**
- **38 IPTTOs**
- **World-class Industries**
- **Large pool of high class capacities
(Professors, PhDs, Professional bodies,
Diaspora capacity)**
- **Research capabilities** (Labs, Workshops, Libraries)

SPACE TECHNOLOGY



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013

Temporary Bioreactor Immersion Systems



Block moulding machines



RENEWABLE ENERGY RESEARCH



WORLD SCIENCE FORUM, BRAZIL, 2013



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013

FOOD AND DRINK PRODUCTS



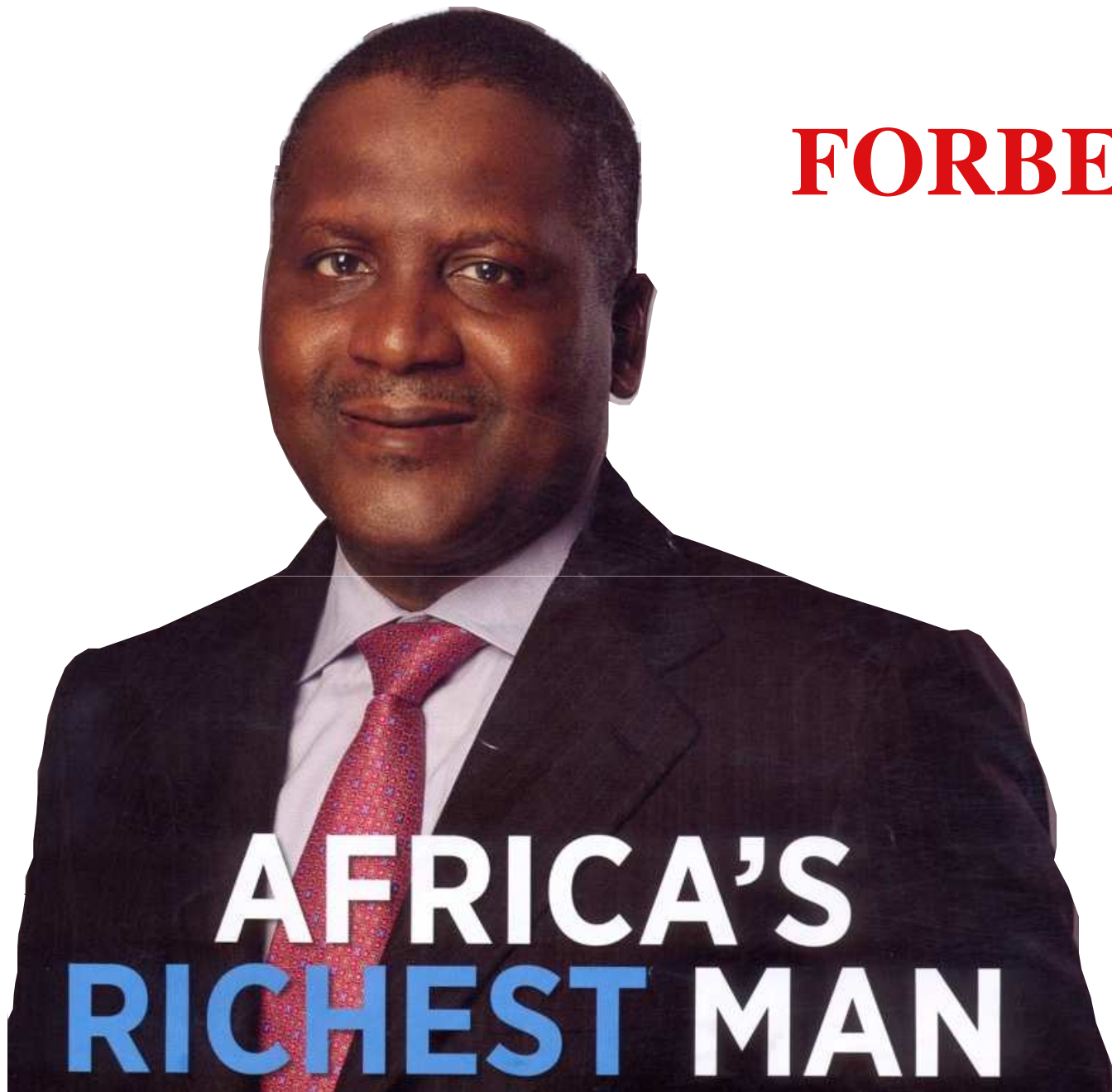
WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013



FORBES

**AFRICA'S
RICHEST MAN**

WORLD SCIENCE FORUM, BRAZIL 2013



FORBES RICHEST BLACK WOMAN IN THE WORLD
(Folorunsho Alakija)

WORLD SCIENCE FORUM, BRAZIL 2013

NIGERIA's
SCIENCE TECHNOLOGY & INNOVATION
BANDWIDTH

- **HIGH**
- **MID/INTERMEDIATE**
- **LOW**
- **TRADITIONAL/LOCAL**
- **ENTREPRENEURSHIP**

**DESPITE THESE R&D
OUTPUTS, CREATIVITIES
AND INNOVATIONS ON
THE GROUND.....**

THE REALITIES???

SUB-URBAN/RURAL LIFE DOMINATES

- **OVER 50% OF THE POPULATION**
– **MORE THAN 100 MILLION**



WORLD SCIENCE FORUM, BRAZIL 2013

BASIC EDUCATION



WATER SUPPLY



AGRIC PRODUCTION



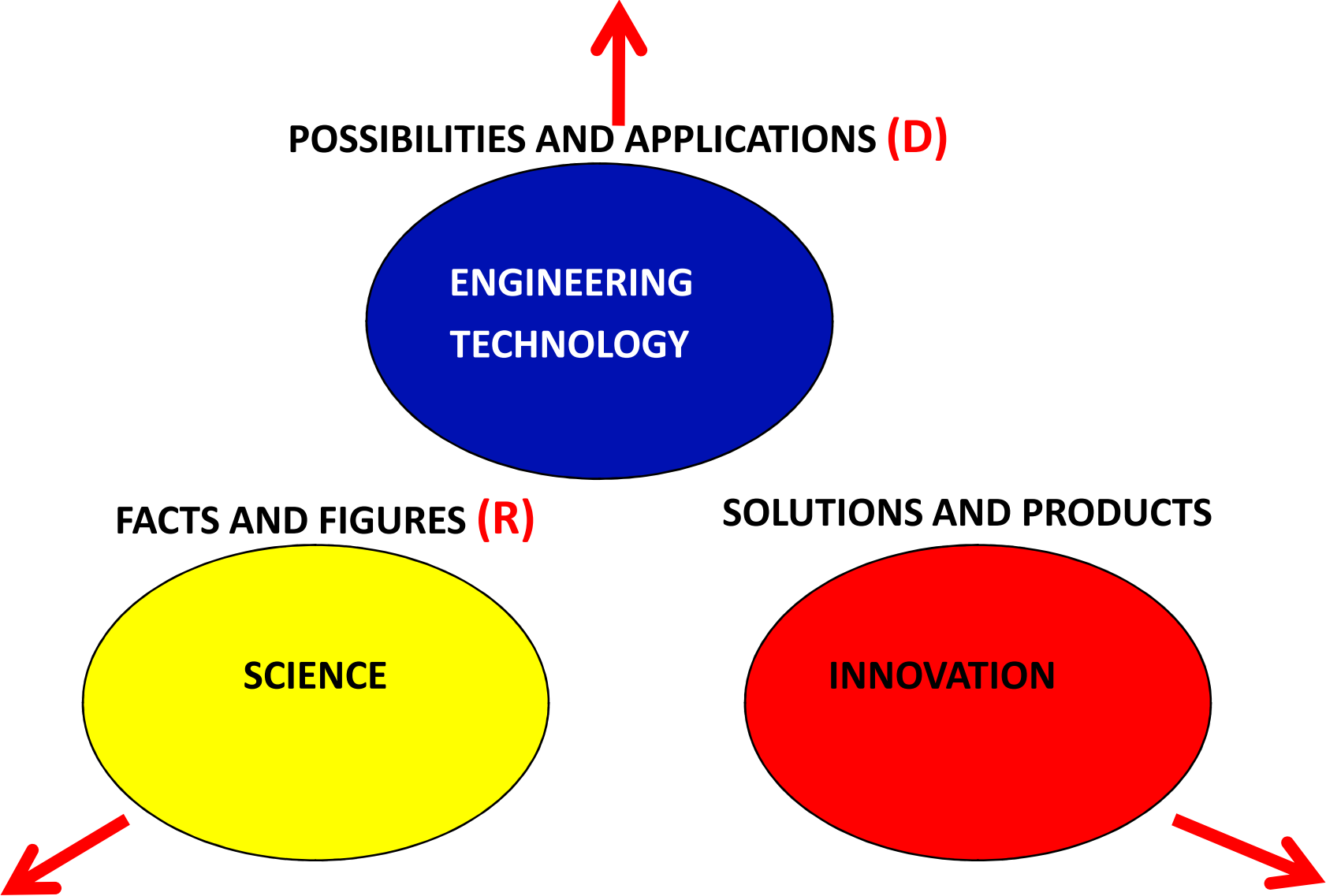
WORLD SCIENCE FORUM, BRAZIL 2013



CHALLENGES OF YOUTH UNDER-EMPLOYMENT

WORLD SCIENCE FORUM, BRAZIL 2013

REALITIES OF **STI** POSTURE?



THE VALLEY OF STI DEATH

Good ideas can end up in



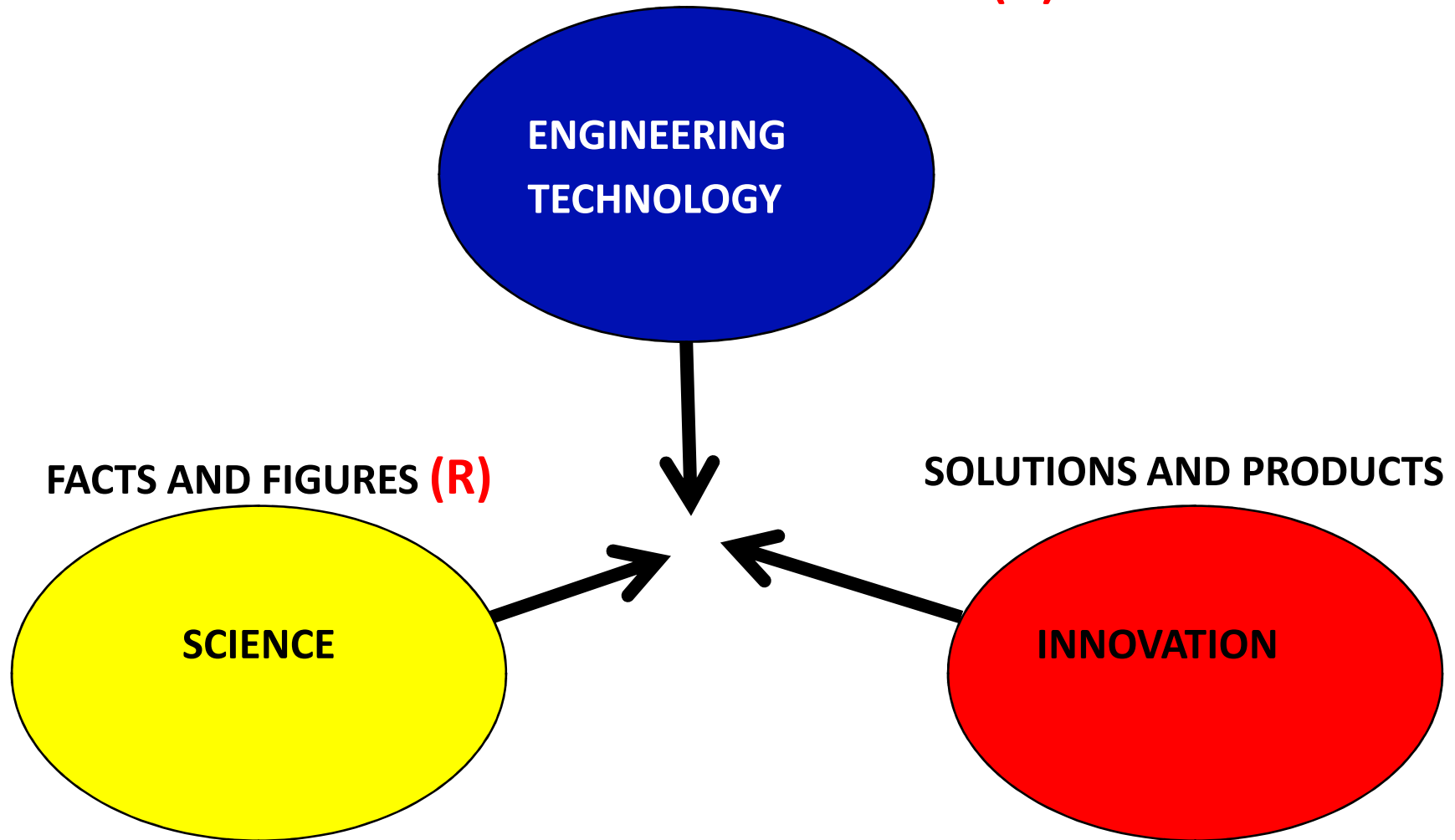
WHAT TO DO

TO

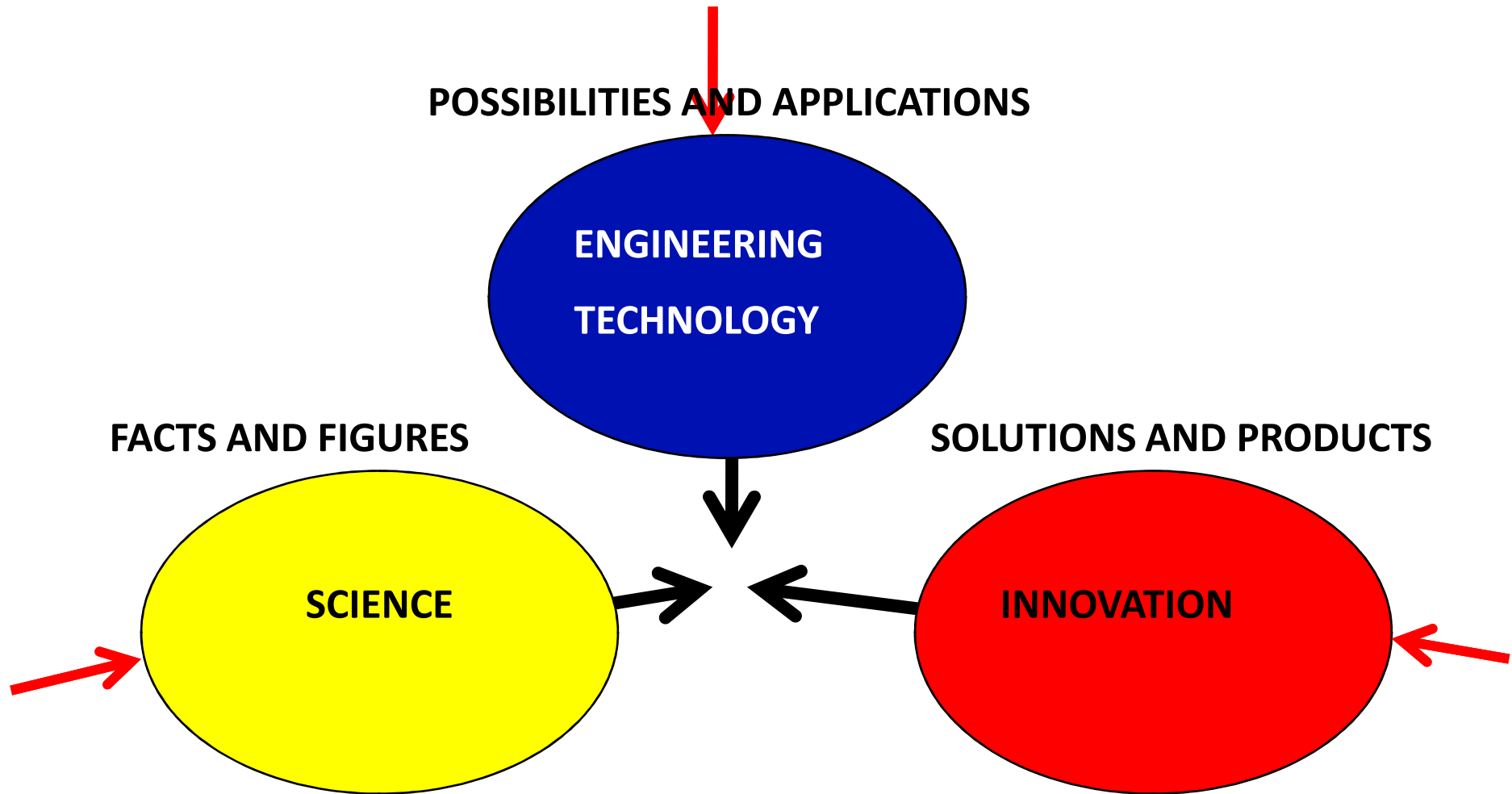
OVERCOME???

NETWORK THE **SETI** ELEMENTS

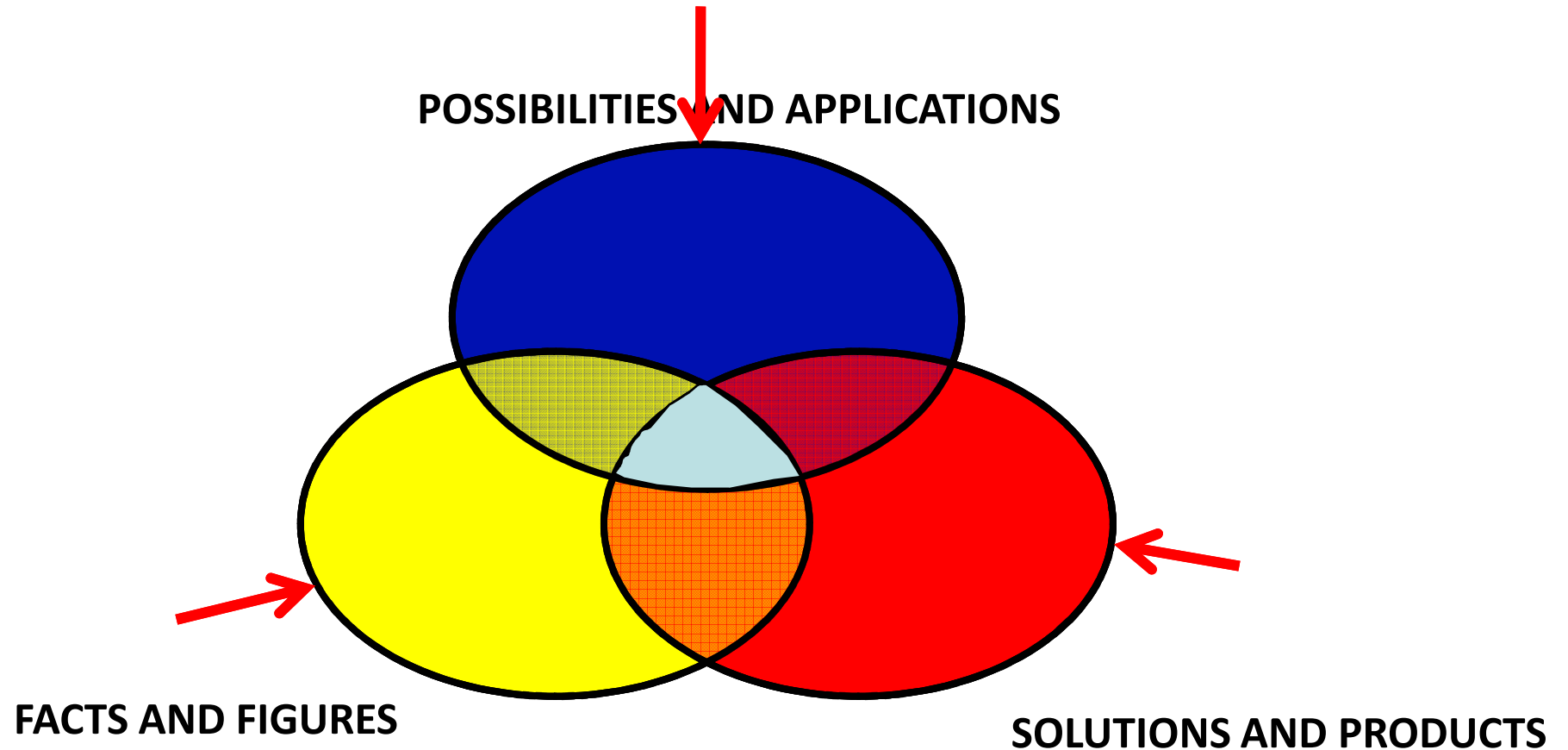
POSSIBILITIES AND APPLICATIONS **(D)**



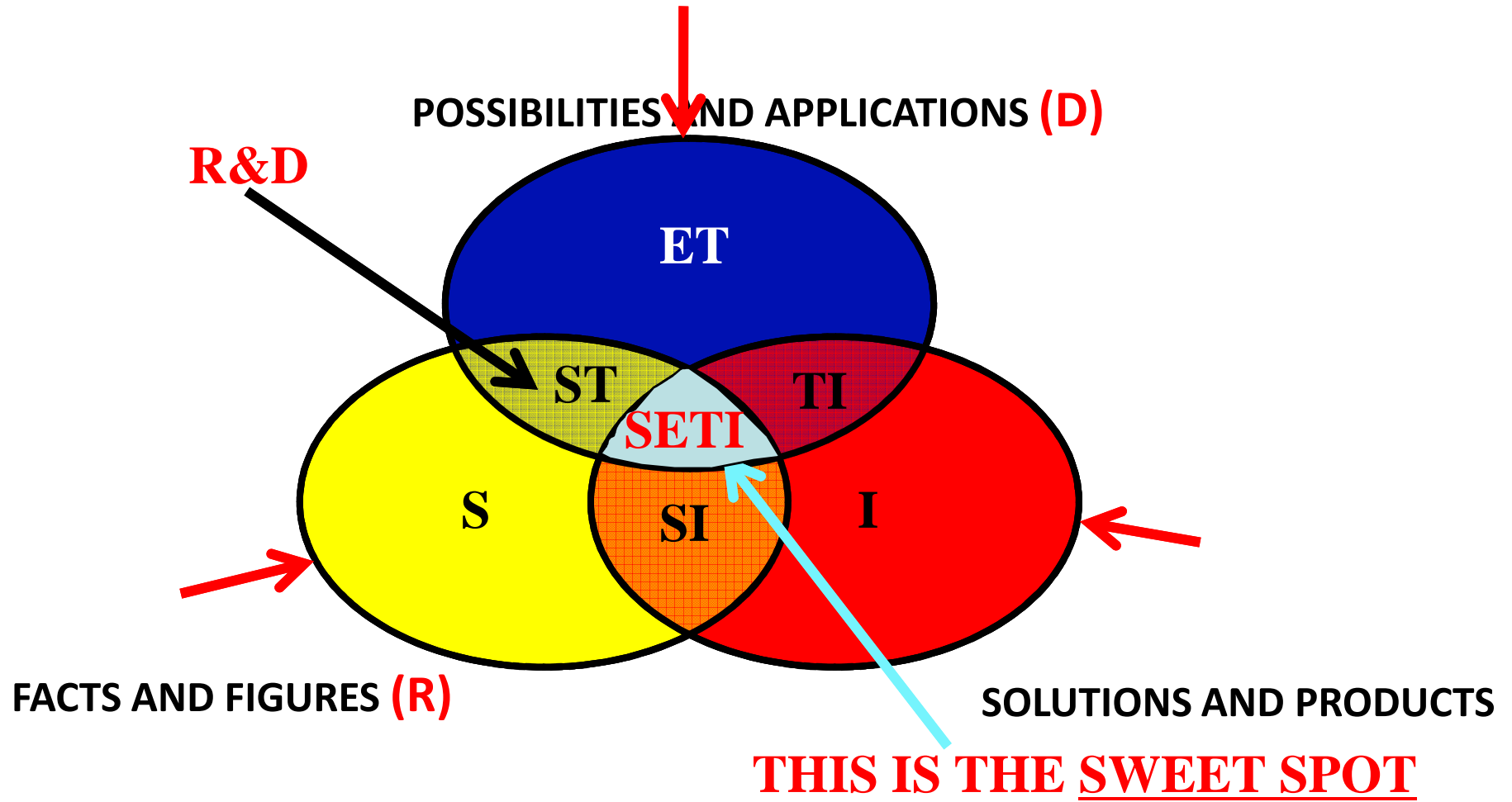
STI GOVERNANCE



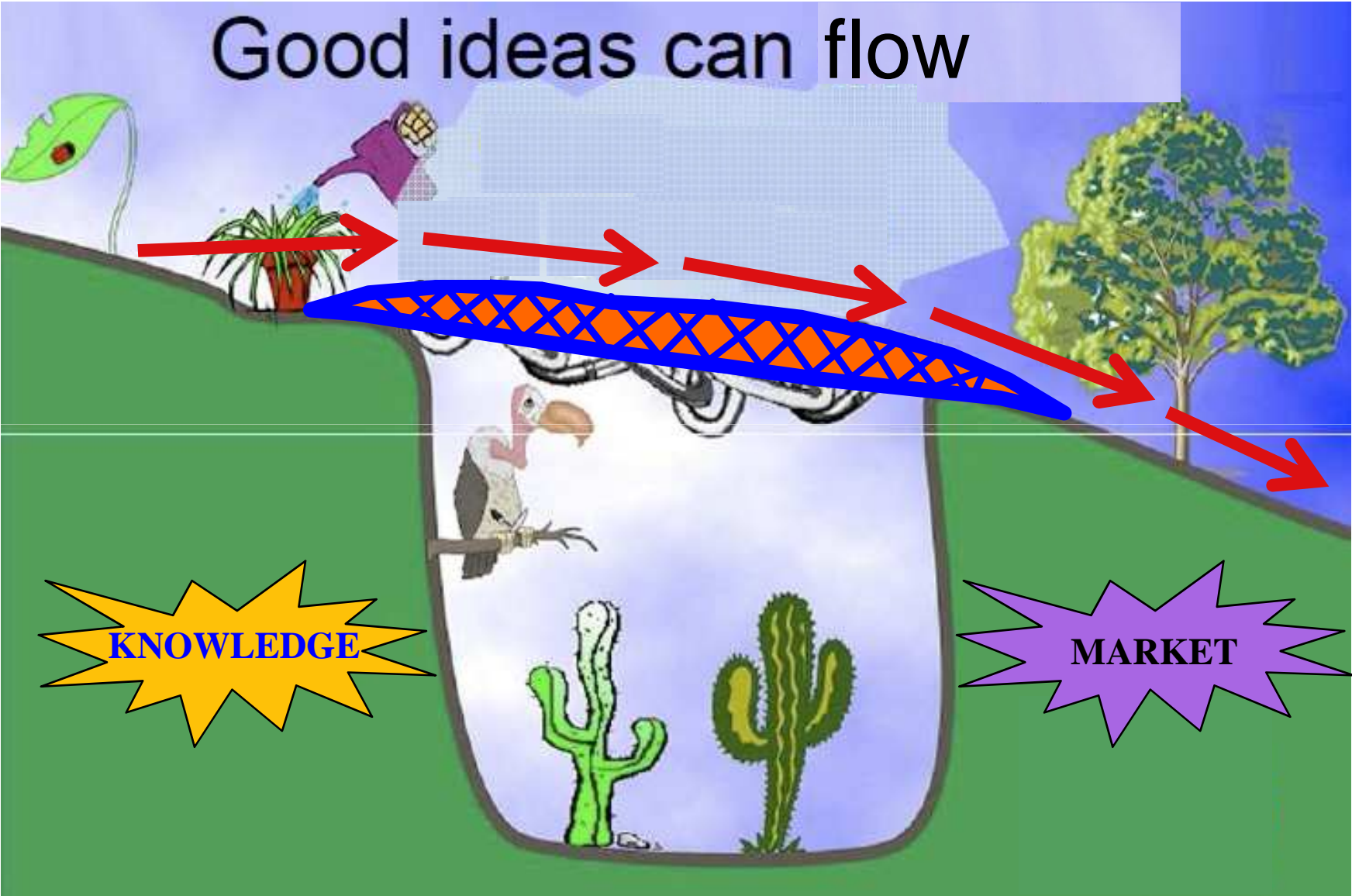
STI POLICIES



UNLEASH THE INTERNAL KNOWLEDGE ENERGY



PROACTIVE **STI** POSTURE



**CREATE A FUNCTIONAL
S TO I SYSTEM!!**

TRANSFORMED ACADEMIA (UNIVERSITIES, POLYTECHNICS, RIs....)

- **TEACHING & TRAINING CENTRES**
- **R&D, EXPERIMENTATION AND
DISCOVERY CENTRES**
- **PRODUCTION AND INDUSTRIAL
CENTRES**
- **ENTERPRISES WHO NEEDS TO SELL
THEIR PRODUCTS TO SURVIVE**
- **COLLABORATORS NATIONALLY AND
INTERNATIONALLY**

KEY CAPITAL INVESTMENTS

- **HUMAN CAPITAL**
 - TO BECOME INNOVATIVE ENTREPRENEURS
 - HIGH VALUES
 - KNOW-HOWS
 - MANAGERIAL SKILLS
 - ORGANISATIONAL SKILLS
- **ENVIRONMENTAL CAPITAL**
 - TO RECOGNISE THE VALUE AND POTENTIAL OF THE NATURAL ENVIRONMENT
 - THE SUN, CLIMATE, RIVERS, SEEDS, INSECTS...
 - ORGANISE TO PRODUCE, PROCESS, COMMERCIALISE EFFECTIVELY
 - LITERALLY TO CREATE JOBS AND WEALTH

KEY CAPITAL INVESTMENTS

- **SOCIO-CULTURAL/INTERPERSONAL CAPITAL**
 - TO NETWORK AND CREATE STRONG CONNECTIONS
 - TO SHARE KNOWLEDGE, EXPERIENCES, DIFFICULTIES, OPPORTUNITIES
 - TO NEGOTIATE, DISCUSS AND WORK JOINTLY
- **TECHNICAL CAPITAL**
 - TO INVESTIGATE, DISCOVER, DEVELOP, INCORPORATE AND INTEGRATE INNOVATIVE TECHNOLOGIES
 - SUCH AS NEW TOOLS, NEW MACHINES, NEW PROCESSES, PRODUCTION TECHNIQUES
 - ALL TOWARDS IMPROVEMENT OF PRODUCTIVITY
- **FINANCIAL CAPITAL**
 - TO BETTER MANAGE FINANCES
 - TO START SUSTAINABLE PROJECTS

KEY CAPITAL INVESTMENTS

**ALL DEVELOPED TOGETHER AS THEY
REINFORCE ONE ANOTHER!!!!**

HELIX OF EFFICIENT DEVELOPMENT DELIVERY

GOVERNMENT (LEADERSHIP)

- **POLITICAL**
- **ECONOMIC**
- **MORAL**
- **TECHNOLOGICAL**



**SUSTAINABLE
NATION BUILDING**



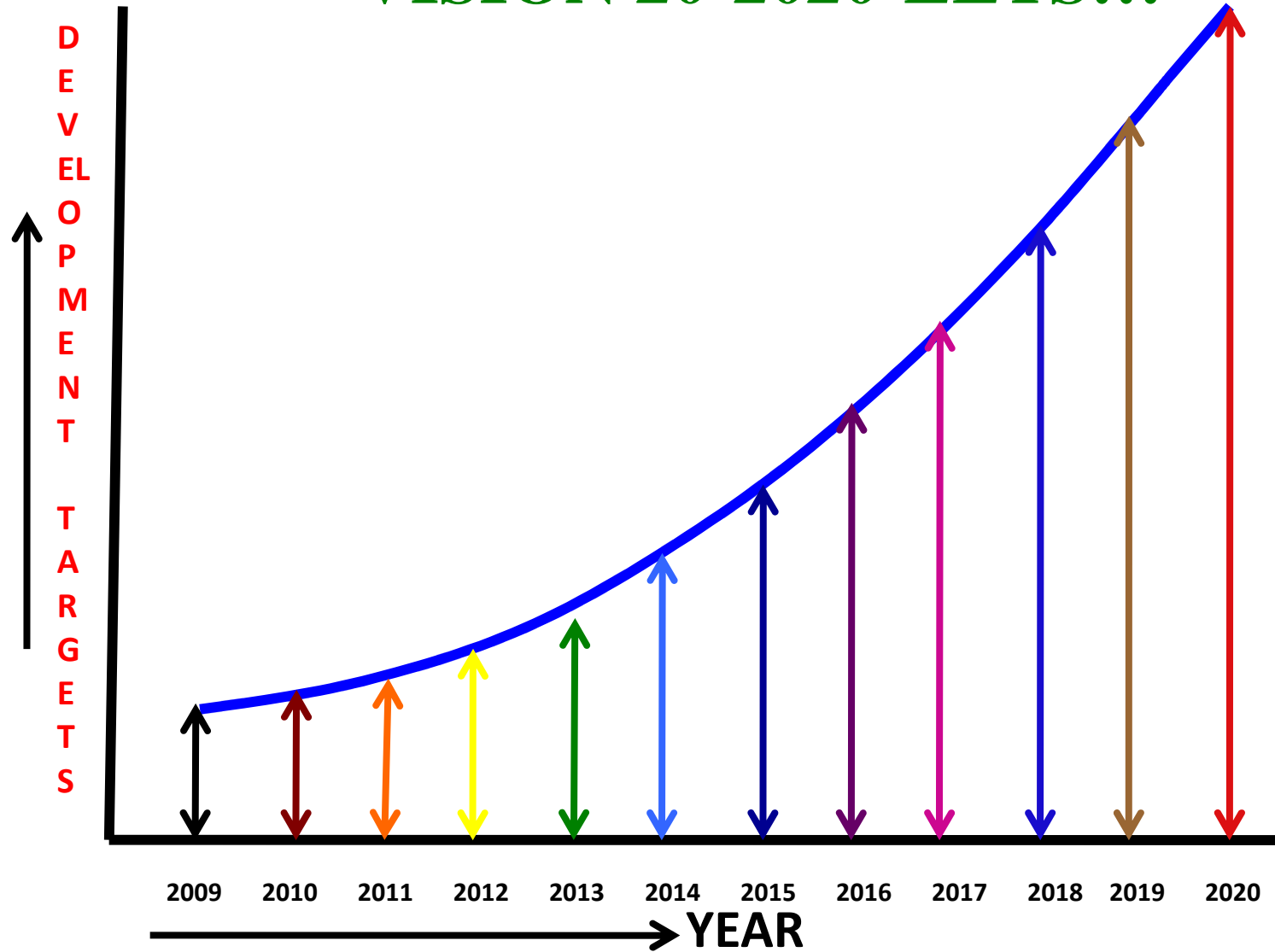
INDUSTRY/ENTERPRISE



KNOWLEDGE (SETI)

WORLD SCIENCE FORUM, BRAZIL 2013

VISION 20-2020-LETS...



CONCLUSIONS

SOME FEW RECOMMENDATIONS

RECOMMENDATION (1)

**INTENSE AND PROUD PROMOTION
OF “NIGERIA’S” TECHNOLOGIES
AND INNOVATIONS (STI OUTPUTS)**

**REGULAR INSTITUTIONAL SCIENCE
TECHNOLOGY AND INNOVATION
EXHIBITIONS & TECHMARTS**

RECOMMENDATION (2)

TRANSFORM AND TAKE A
DELIBERATE MASS JOB CREATION
POSTURE

(SUPPORT LEADERSHIP INNOVATIVELY)

DELIBERATE SKILLS BASED GAINFUL
EMPLOYMENT GENERATION AND
WEALTH CREATION



WORLD SCIENCE FORUM, BRAZIL 2013

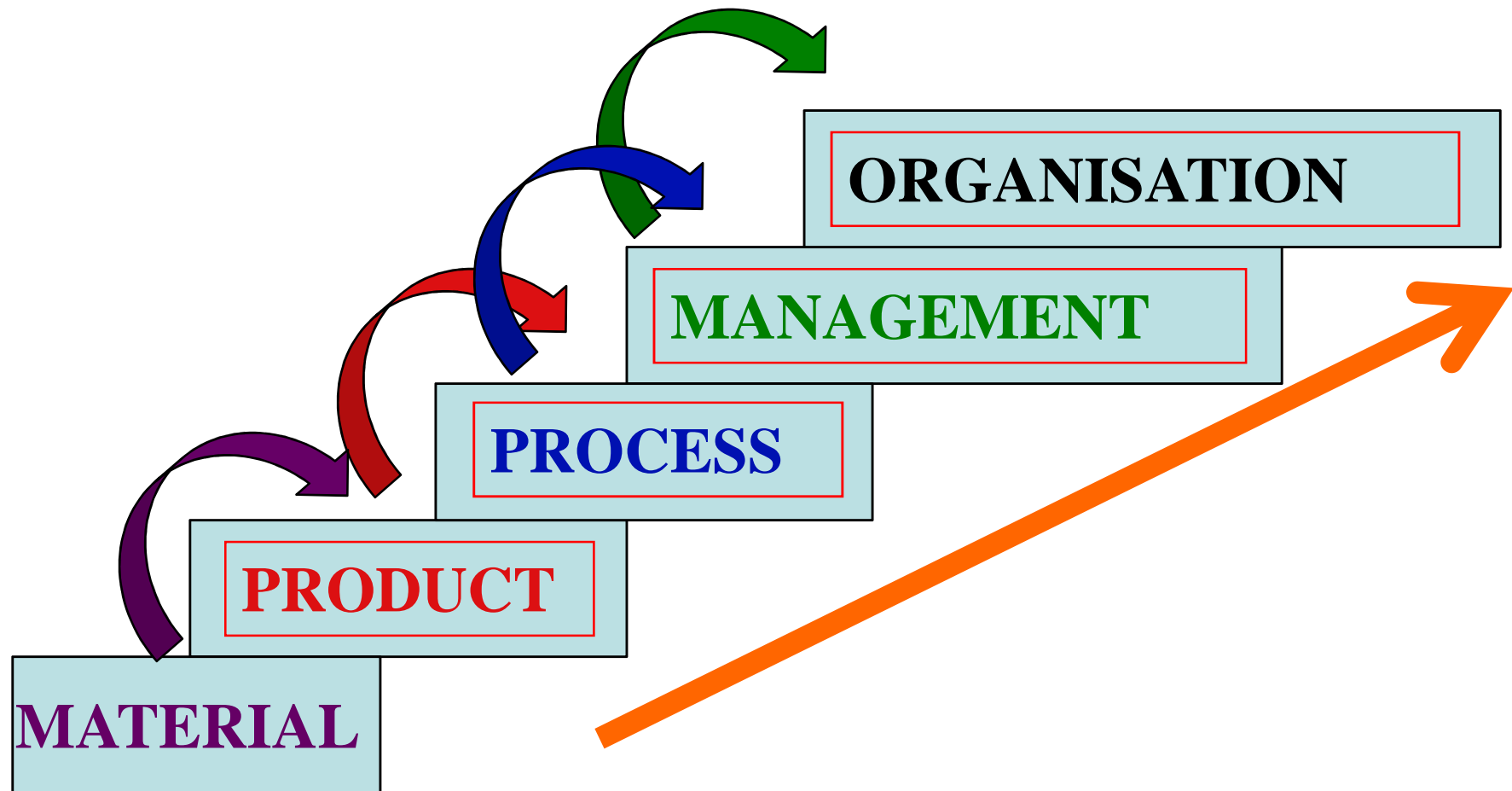


WORLD SCIENCE FORUM, BRAZIL 2013

SCIENCE THROUGH TECHNOLOGY TO
INNOVATION

VALUE CHAIN

....WE MUST BE SMENNOVATIVE

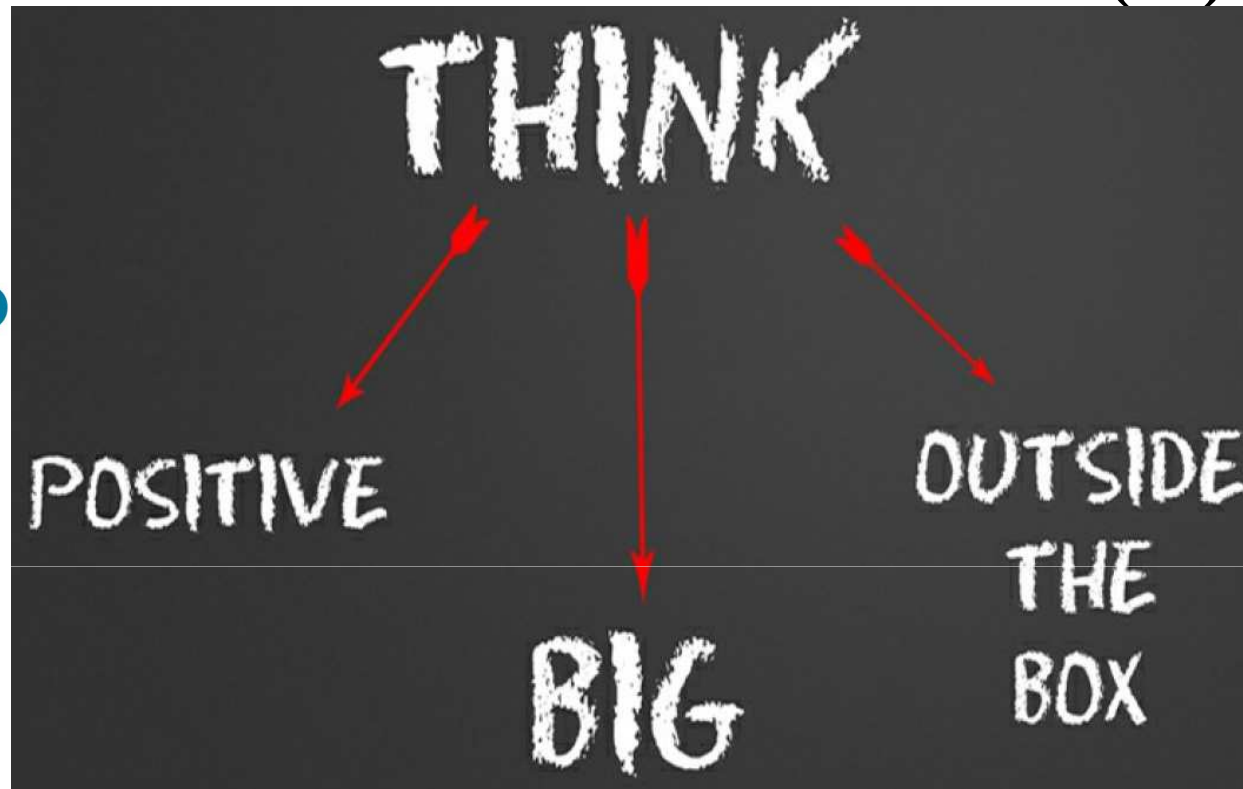


RECOMMENDATION (3)

**GRADUALLY DEVELOP
VIABLE AND VISIBLE**

**“S T I” BASED LOCAL AND GLOBAL
PARTNERSHIPS**

RECOMMENDATION (4)



TO LINK

ACADEMIA TO INDUSTRY



WORLD SCIENCE FORUM, BRAZIL 2013

**ESTABLISH VIABLE SCIENCE
AND TECHNOLOGY PARKS**

RECOMMENDATION (5)

BUILDING THE CRITICAL MASS
OF “INDUSTRIAL” MANPOWER
STRATEGICALLY



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013

RECOMMENDATION (6)

ESTABLISH THE APPROVED
NATIONAL RESEARCH AND
DEVELOPMENT FUND (NRDF)
“minimum of 1% GDP”?

**CENTRALISE AND FUNCTIONALISE R&D
FUNDING!!**

RECOMMENDATION (7)

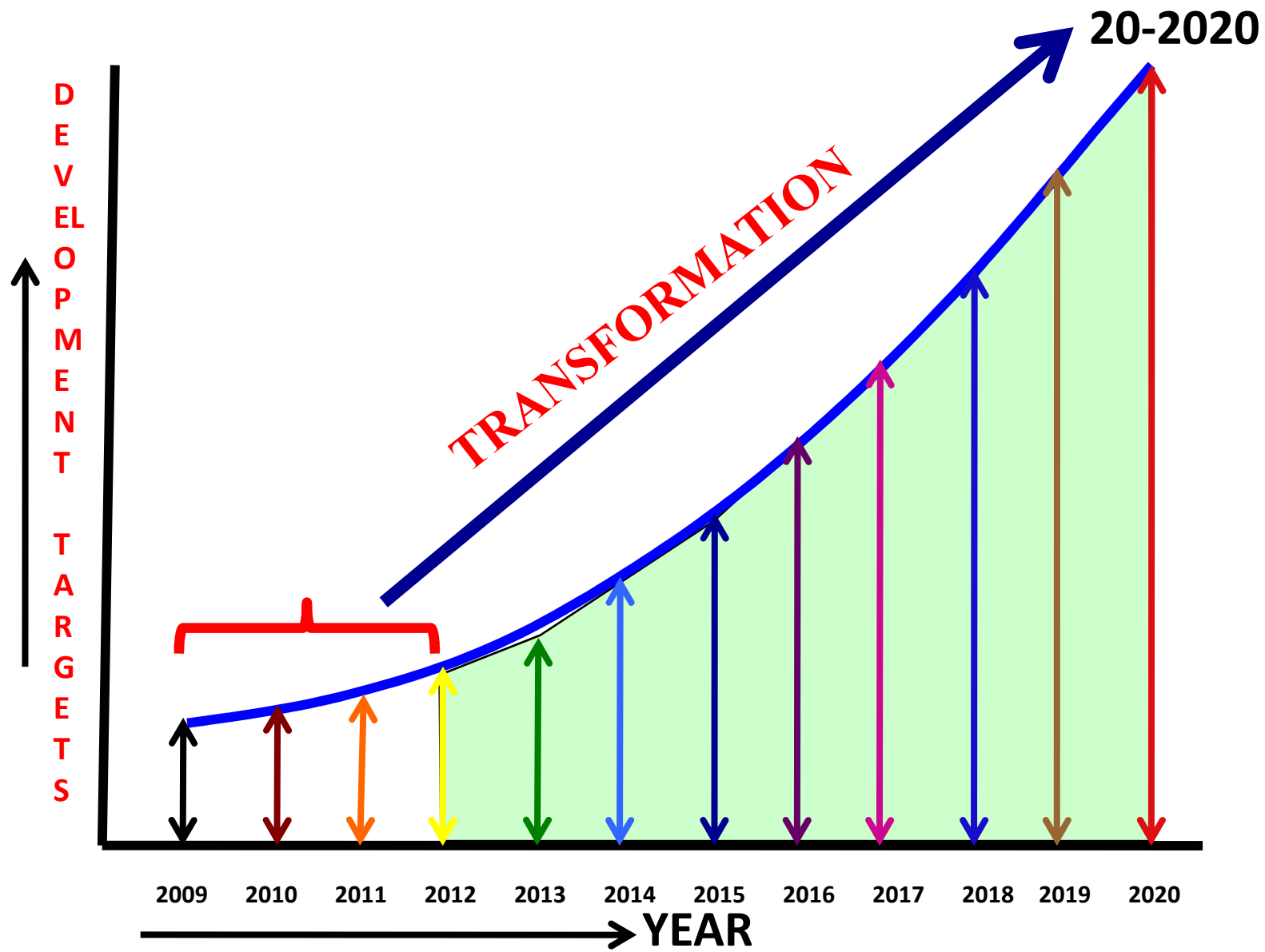
IMPLEMENT THE APPROVED

NRDI COUNCIL

(CHAIRERD BY THE PRESIDENT)

PLACE KNOWLEDGE GOVERNANCE

AT THE CENTRE



AND MANY ARE WISHING NIGERIA

“GOODLUCK!!!”



WORLD SCIENCE FORUM, BRAZIL 2013

WITH ALL THESE, I HOPE...



FUNDAMENTAL ROLES OF SCIENCE IN INNOVATION

FOR GLOBAL SUSTAINABLE DEVELOPMENT



WORLD SCIENCE FORUM, BRAZIL 2013



WORLD SCIENCE FORUM, BRAZIL 2013