



Synergies between Industrial and Health  
Policies: *a contribution to economic  
transformation?*

*Watu Wamae and Maureen Mackintosh*

Conference Paper nº 40

**III CONFERÊNCIA INTERNACIONAL DO IESE**

**“MOÇAMBIQUE: ACUMULAÇÃO E TRANSFORMAÇÃO EM CONTEXTO DE CRISE INTERNACIONAL”**

(4 & 5 de Setembro de 2012)

# **Synergies between industrial and health policies: a contribution to economic transformation?**

Watu Wamae and Maureen Mackintosh

# Scope of comments

- Integrating health systems strategies with local production systems
  - Local production systems: industrial production systems in health systems strengthening
  - The role of capabilities in linking the two
- Contributing to structural change (transformation) in the economy
  - Types of capabilities (R&D and non-R&D)
  - Scale of D&E in innovation systems
  - Role of non-R&D capabilities in innovation systems strengthening
- The significance of D&E in the structure of African economies
  - The sectoral structure of African economic growth
  - D&E role in structural change (transformation)
  - The role of learning in developing capabilities

# Integrating health systems strategies with local production systems

- On-going study: “Industrial Productivity, Health Sector Performance and Policy Synergies for Inclusive Growth: a study in Tanzania and Kenya”
  - African Centre for Technology Studies (ACTS) Nairobi, Research on Poverty Alleviation (REPOA) Dar es Saalam and The Open University, UK
  - Funded by the UK Department for International Development (Dfid) and the UK Economic and Social Research Council (ESRC)
  - Commenced June 2012 and ends in November 2014
- Aim of the study: to identify opportunities for improved local industrial supply of essential health commodities to strengthen health systems performance

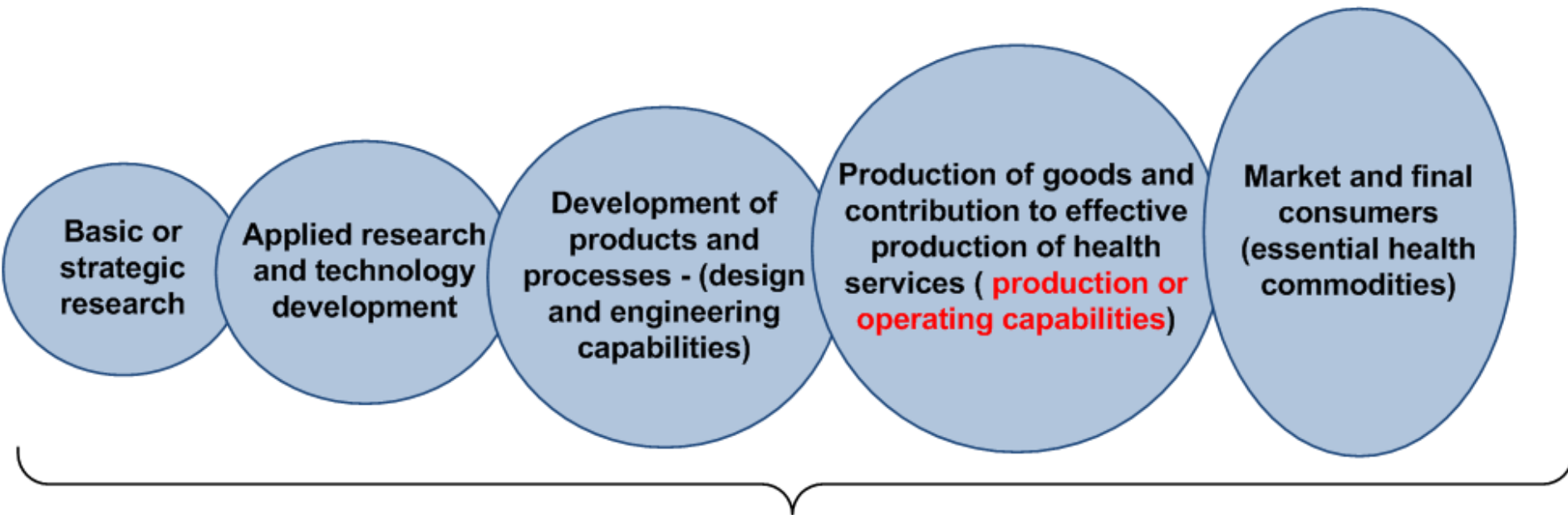
# Integrating health systems strategies with local production systems

- The research traces potential synergies between industrial and health policy by drawing on three analytical frameworks
  - Value chains: up-grading
  - Industrial economics: structural transformation
  - Innovation systems perspective: health systems strengthening
- Three stages upon which we draw preliminary reflections
  - Initial advisory stage and senior stakeholder interviews
  - Health systems research
  - Industrial sector research
- The focus of the presentation is on:
  - local production systems: industrial production systems in health systems strengthening
  - The role of capabilities in linking the two

# Integrating health systems strategies with local production systems

## Production or operating capabilities

capabilities for using knowledge that is embodied in or closely associated with existing production systems and facilities.



*A range of capabilities required including production capabilities – they contribute to innovation in production*

# Integrating health systems strategies with local production systems

- Innovation in production depends on production capabilities
  - capabilities for using knowledge that is embodied in or closely associated with existing production systems and facilities
- For policy to have an impact on structural change, the peculiar nature of technological learning for innovation in specific activities, including within production activities that contribute to the effective production of health services, needs to be addressed
- This implies dealing with policy at two levels
  - policies that explicitly address innovation, and
  - the broader socio-economic policies such as health policies, macro-economic policies, competition policies etc.

# Scope of comments

- Integrating health systems strategies with local production systems
  - Local production systems: industrial production systems in health systems strengthening
  - The role of capabilities in linking the two
- Contributing to structural change (transformation) in the economy
  - Types of capabilities (R&D and non-R&D)
  - Scale of D&E in innovation systems
  - Role of non-R&D capabilities in innovation systems strengthening
- The significance of D&E in the structure of African economies
  - The sectoral structure of African economic growth
  - D&E role in structural change (transformation)
  - The role of learning in developing capabilities



# Contributing to structural change (transformation) in the economy

- Technological capabilities lie at the heart of this process
  - “the resources needed to generate and manage technical change, including knowledge, skills, experience, institutional structures and linkages”, Bell and Pavitt (1993)
- Two categories of technological capabilities:
  - R&D specific capabilities
  - Non-R&D specific capabilities (they play a critical complementary role in converting knowledge to value)
    - Production or operating capabilities
    - **Design and engineering capabilities (D&E capabilities)**

# Contributing to structural change (transformation) in the economy

- R&D specific capabilities
  - Defined as those capabilities for creating new knowledge and transforming it into the specifications for application and production
- Non-R&D specific capabilities
  - Production or operating or capabilities
    - Defined as capabilities for using knowledge that is embodied in or closely associated with existing production systems and facilities
  - **Design and engineering capabilities**
    - Defined as those capabilities for transforming existing knowledge into new, often innovative, configurations for new or changed production systems
- Fragments of data from a few advanced countries suggest that the quantitative scale of D&E activities is greater than R&D activities, and this disparity is greater in developing economies (Bell 2012)

# Main activities of scientists and engineers in the US (Bell, 2006)

- 10% undertook R&D specific activities
- 90% were engaged in activities that are non-R&D specific, but key in translating research into practical applications
  - A large proportion of them were engaged in design and engineering activities

'S&T Capabilities': What do they do?  
A glimpse at the case of the US

## The Activities of Scientists and Engineers in the US: 2003

Research (basic and applied) and technological development	1,843,397	10%
Design (equipment, processes, structures, models) and computer programming, systems development, etc.	2,379,235	13%
Management/Supervision (people, projects, quality, productivity, etc.)	3,340,646	19%
Business, administrative and production activities (accounting, personnel, sales, maintenance, etc.)	3,719,954	21%
Professional services (financial services, healthcare, legal, etc.)	4,181,148	23%
Teaching	1,935,885	11%
Other specified	626,790	3%
<i>All Above</i>	18,027,055	100%

Source: Annex Tables 1, derived from the US NSF.

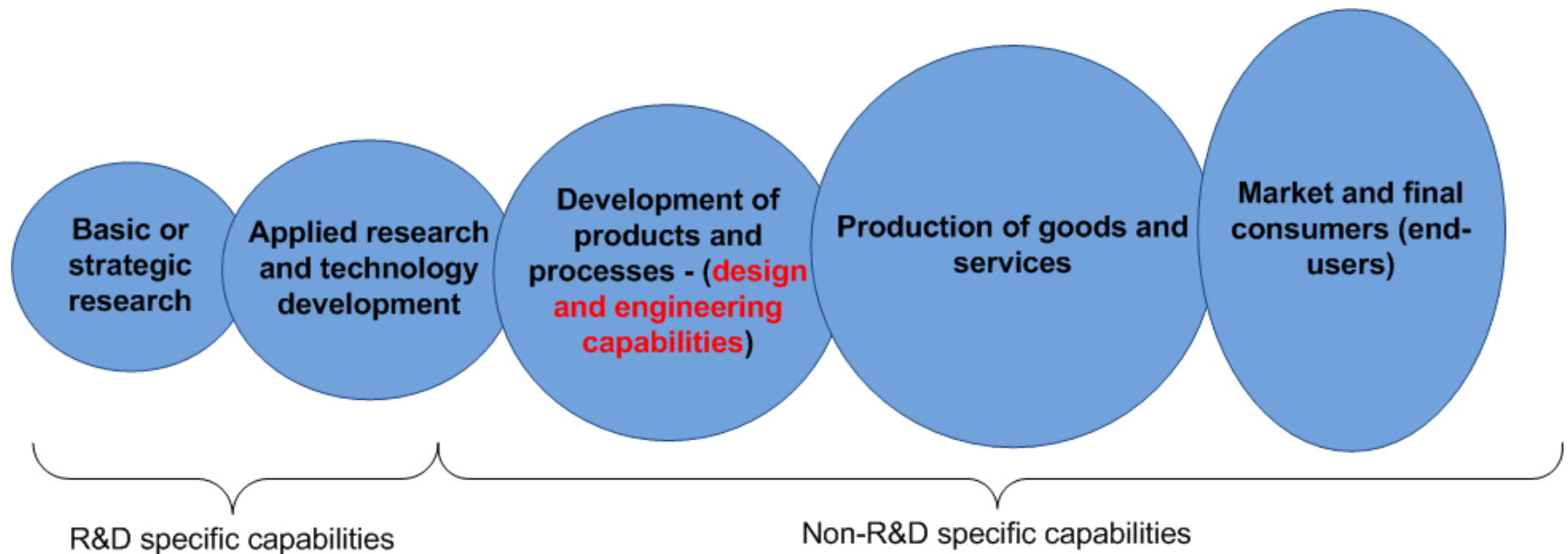
# Contributing to structural change (transformation) in the economy: what is D&E? (Bell 2012)

- Design
  - An activity or process that creates the **‘specifications’** of products, processes and production systems (not just about the aesthetic form of objects)
- Engineering
  - Overlaps with design
  - But extends towards the realisation of specifications in operational forms – includes various kinds of:
    - ‘project management’ and procurement
    - implementation and ‘system integration’
    - testing, initiation and supervision
- **Design and engineering capabilities**
  - Defined as those capabilities for transforming existing knowledge into new, often innovative, configurations for new or changed production systems

# The significance of D&E in structure of African economies: the role of D&E

## Design and engineering capabilities

the capabilities that play a direct (and critical) role in adapting and modifying specifications for integration into processes and products



# Scope of comments

- Integrating health systems strategies with local production systems
  - Local production systems: industrial production systems in health systems strengthening
  - The role of capabilities in linking the two
- Contributing to structural change (transformation) in the economy
  - Types of capabilities (R&D and non-R&D)
  - Scale of D&E in innovation systems
  - Role of non-R&D capabilities in innovation systems strengthening
- The significance of D&E in the structure of African economies
  - The sectoral structure of African economic growth
  - D&E role in structural change (transformation)
  - The role of learning in developing capabilities

# The significance of D&E in the structure of African economies

- The sectoral structure of African economic growth (Bell, 2012)

	% change 1999 - 2009			
	Kenya	Tanzania	Uganda	
Agriculture and fishing	-30	-16	-56	ISIC Divs 01-05
Services	22	1	18	ISIC Divs 10-45
Industry	-9	25	31	ISIC Divs 50-99
of which manufacturing	-24	-1	-18	
<b>Other</b>	<b>23</b>	<b>50</b>	<b>79</b>	

<b>Other</b>	
Mining, oil, gas, quarrying	ISIC Divs. 10-14
Construction	ISIC Div. 45
Electricity, gas, water supply	ISIC Divs. 40-41

## The significance of D&E in the structure of African economies: the role of D&E in transformation

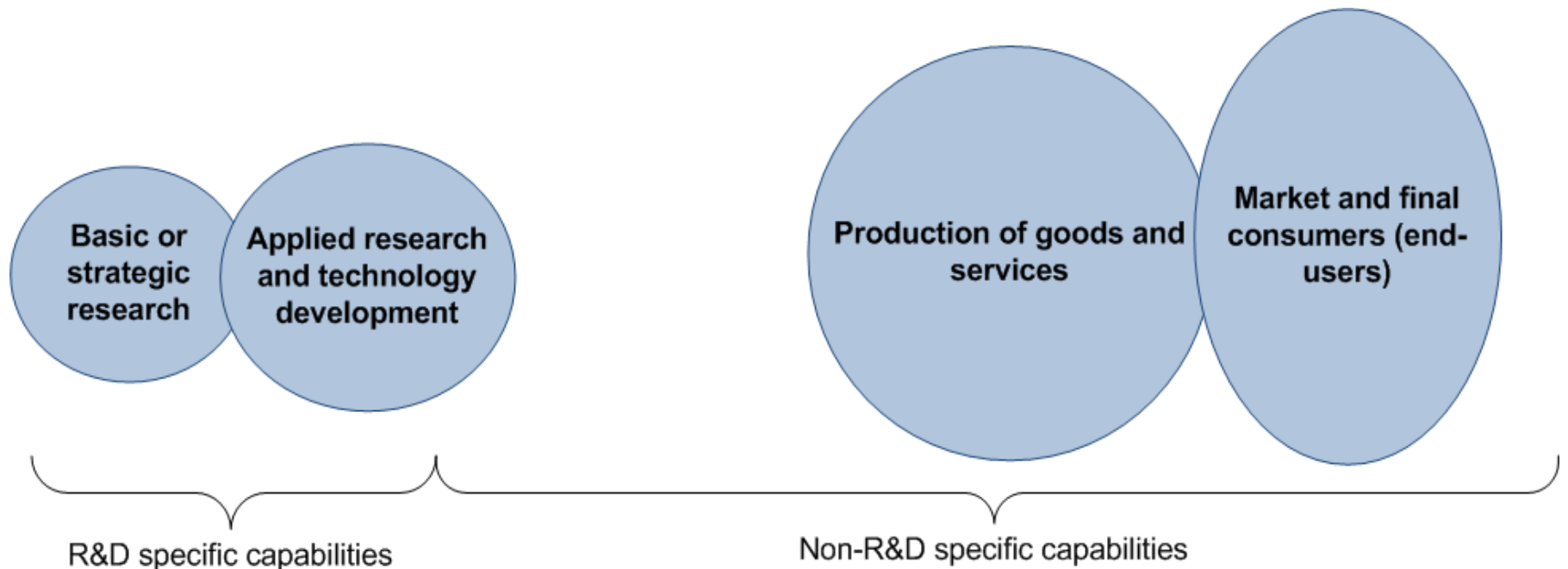
- The continuing surge in world demand for natural resources is expected to remain the driving force for growth in Sub-Saharan Africa.
  - The concentration of investments is highly skewed in favour of countries rich in natural resources. Mozambique is reported to have become a leader in natural resource driven investment in southern and eastern Africa.
- Growth paths dominated by these resource-intensive and capital-intensive sectors can be massively ‘excluding’ in a broad macro sense e.g. in much of Latin America through most of the 20th century (Bell, 2012)
- But not always, investment in technological capabilities including D&E in Africa seem particularly important (Bell, 2012)
- The sectoral structure of growth, especially in African economies, is heavily concentrated on sectors that are strikingly D&E-intensive



# The significance of D&E in the structure of African economies: creating D&E capabilities

## Design and engineering capabilities

the capabilities that play a direct (and critical) role in adapting and modifying specifications for integration into processes and products



# The significance of D&E in the structure of African economies: the role of D&E in transformation

- It involves a complex learning process within the firm
  - entrepreneurs must adapt and up-grade the technological capabilities of their firms to meet the needs of the final consumers
  - adapting and up-grading of technological capabilities requires deliberate investment efforts in knowledge assets within the firm - may involve substantial deliberate costs
- Policies that explicitly address innovation, and implicit policies must be coherent to allow the creation of technological capabilities (especially D&E capabilities in Africa)
  - Implicit policies i.e. the broader socio-economic policies such as health policies, macro-economic policies, competition policies etc.
  - With effective policy coherence, growth in extractive industries leads to growth in infrastructure (which contributes to growth in other sectors)
- Progressive diversification into activities that attract relatively small amounts of investment, but are critical for social inclusion (such as health) and the role of D&E in the transformation must be considered



Av. Patrice Lumumba, 178 - Maputo  
MOÇAMBIQUE

Tel. + 258 21 328894  
Fax + 258 21 328895  
[www.iese.ac.mz](http://www.iese.ac.mz)