



---

# The evolution of national systems of innovation in agriculture and resulting prospects for Sub-Saharan Africa: Lessons learned

Nicole Rippin



# 1 Introduction

## 1.1 The Agricultural Sector in Africa: Facts and figures

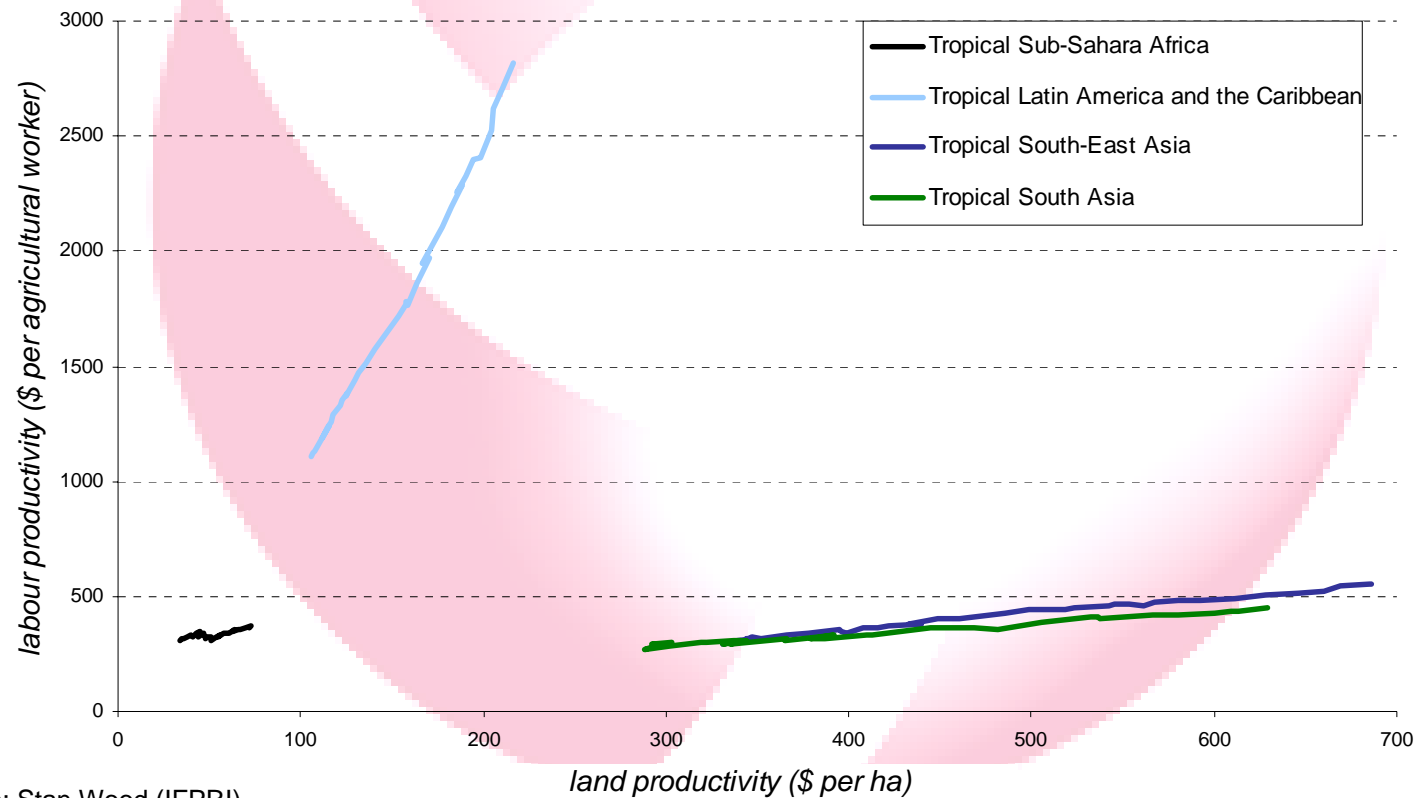
- About 56% of Africans depend on agriculture for their livelihoods
- The modernisation of the agricultural sector is believed to be a crucial precondition for the modernisation of the African economy as a whole
- Agricultural productivity: A 10% increase in crop yields may deliver 6-10% people from extreme poverty
- Africa is the only region in the world where agricultural production per capita has declined over the past 40 years: Total food production increases annually at about 2%, population at about 3%



# 1 Introduction

## 1.1 The Agricultural Sector in Africa: Productivity

Factor productivity in agriculture 1961-2005 (in 1989 –1991 international Dollar)

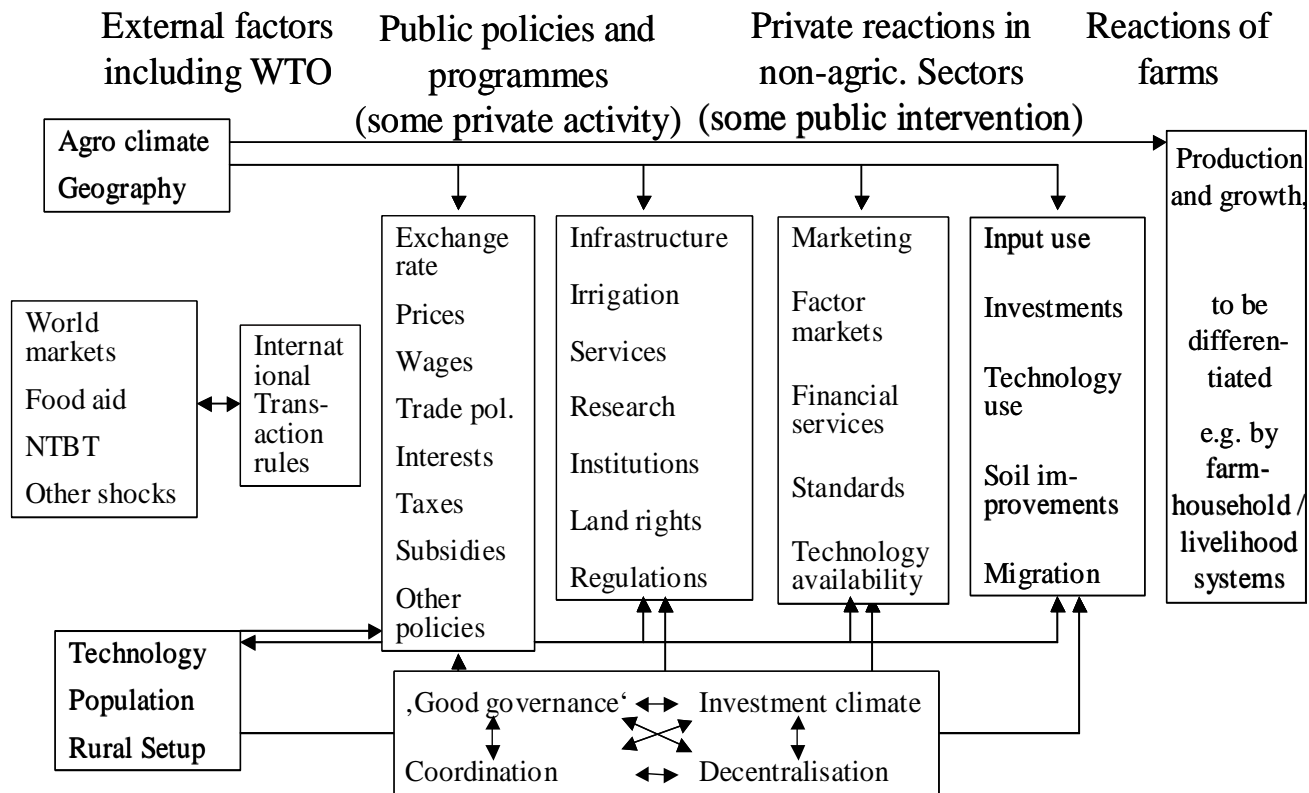


Quelle: Stan Wood (IFPRI)



# 1 Introduction

## 1.2 The Green Revolution: Major policy domains

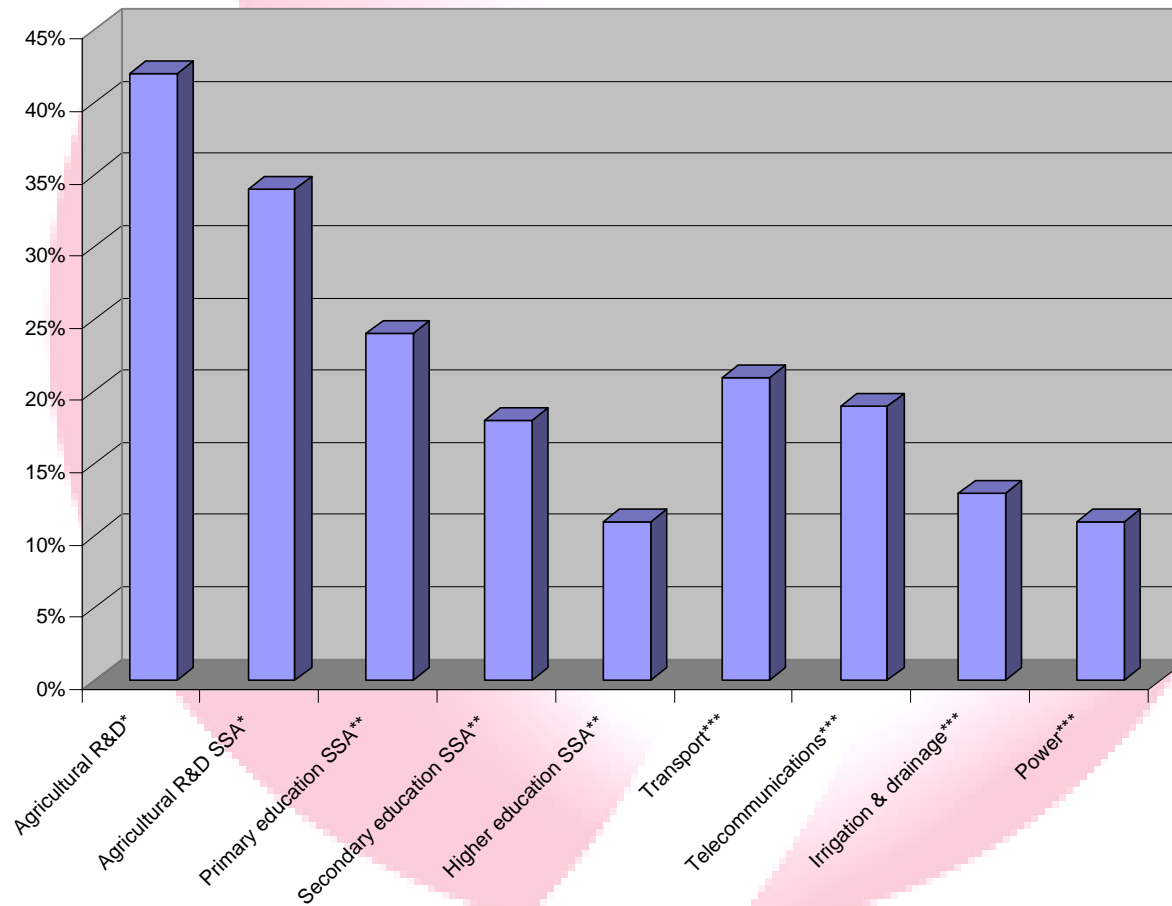


Quelle: Michael Brüntrup



# 1 Introduction

## 1.3 Rates of return: Sectoral comparison



\* Alston et al (2000): Median rate of return    \*\* Psacharopoulos (1994): Expected rate of return    \*\*\* World Bank (1994): Average rate of return 1983-92



# 1 Introduction

## 1.3 Rates of return: Sectoral comparison Uganda

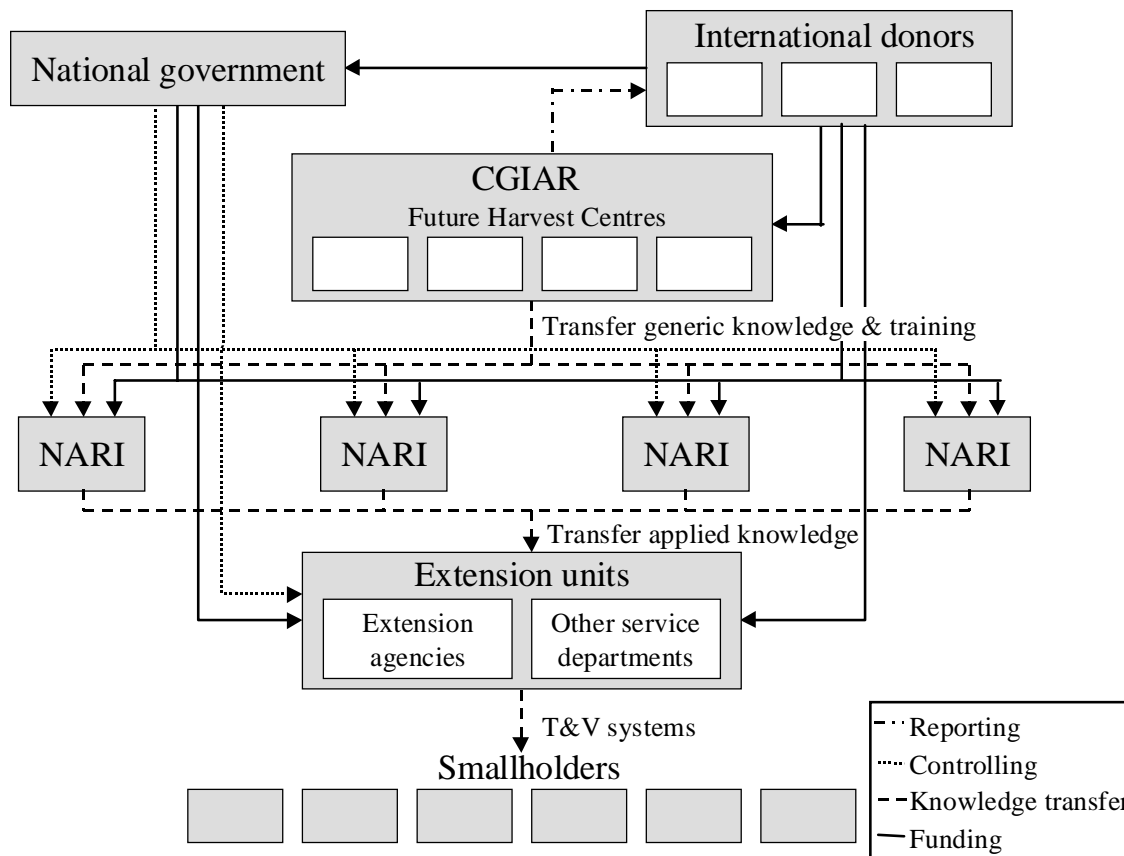
Investment	Central	East	North	West	Uganda
<b>Benefit–cost ratio</b>					
Agricultural R&D	12.49	10.77	11.77	14.74	12.38
Education	2.05	3.51	2.10	3.80	2.72
Feeder Roads	6.03	8.74	4.88	9.19	7.16
Murram Roads	n.s.	n.s.	n.s.	n.s.	n.s.
Tarmac Roads	n.s.	n.s.	n.s.	n.s.	n.s.
Health	1.37	0.92	0.37	0.96	0.90
<b>Number of poor people reduced per million shillings</b>					
Agricultural R&D	21.75	66.31	175.52	48.91	58.39
Education	3.57	21.60	31.38	12.62	12.81
Feeder Roads	10.51	53.85	72.82	30.49	33.77
Murram Roads	4.08	11.88	14.80	9.77	9.70
Tarmac Roads	2.59	13.12	62.92	9.39	9.73
Health	2.60	6.15	5.95	3.46	4.60

Quelle: Shenggen, Xiaobo und Rao (2004)



# 2 National Systems of Innovation

## 2.1 The Top-Down Model





## 2 National Systems of Innovation

### 2.2 Case Study AGRAN\*

- 1992: Start reform process of Benin's NARS with the creation of the NARI INRAB
- Since 1999 the GTZ project AGRAN assists the transition process of INRAB to a performing public enterprise for technology development coordinating all agricultural research activities in Benin. AGRAN is supported by Dutch and Danish Cooperation
- Integration of AGRAN in the bilateral sector program ProCGRN (conservation and management of natural resources) in 01/2004

\* Appui à la Gestion de la Recherche Agricole Nationale





## 2 National Systems of Innovation

### 2.3.1 Lessons Learned: The role of the national government

#### **Weak point(s):**

- Responsibility of government for all agricultural research

#### **Lessons learned:**

- Privatisation or joint funding whenever public good character is weak
- Introduction and implementation of IPR
- In general: basic research more insecure than applied research hence more likely public responsibility



## 2 National Systems of Innovation

### 2.3.2 Lessons Learned: Management of financial resources

#### **Weak point(s):**

- Main financial instrument: Block grants (input-oriented), irregular disbursement

#### **Lessons learned:**

- Introduction of distinct financial instruments:
  - Push-intervention for basic research: regularly disbursement (e.g. block grants)
  - Pull-intervention for specific desired technologies: disbursement dependent on achievement of pre-specified criteria (e.g. competitive research funds)
- Introduction of efficient fiscal management: e.g. AGRAN introduced regularly financial reports and established analytical accounting



## 2 National Systems of Innovation

### 2.3.3 Lessons Learned: Responsibilities and networks

#### **Weak point(s):**

- Separation of knowledge generators and users (Top-Down approach):  
Little involvement of stakeholders in R&D-activities
- Weak linkages to other research organisations (e.g. NGOs, FBOs, CBOs)
- Centralisation of R&D in headquarters of congested urban areas

#### **Lessons learned:**

- Participation of all stakeholders in R&D (funding, priority setting, conducting research, dissemination, M&E): e.g. AGRANs management cycle
- Establishing partnerships and linkages to other research organisations:  
e.g. AGRANs concept for demand-driven agricultural research
- Decentralisation: national for basic, local for applied research:  
e.g. AGRANs concept for demand-driven agricultural research



## 2 National Systems of Innovation

### 2.3.3 Responsibilities and networks: Management cycle

#### **Key constituents:**

- Priority setting in collaboration with FBOs
- Peer review of inter-institutional research proposals
- Evaluation of research results
- Publications & decision making for transfer to extension

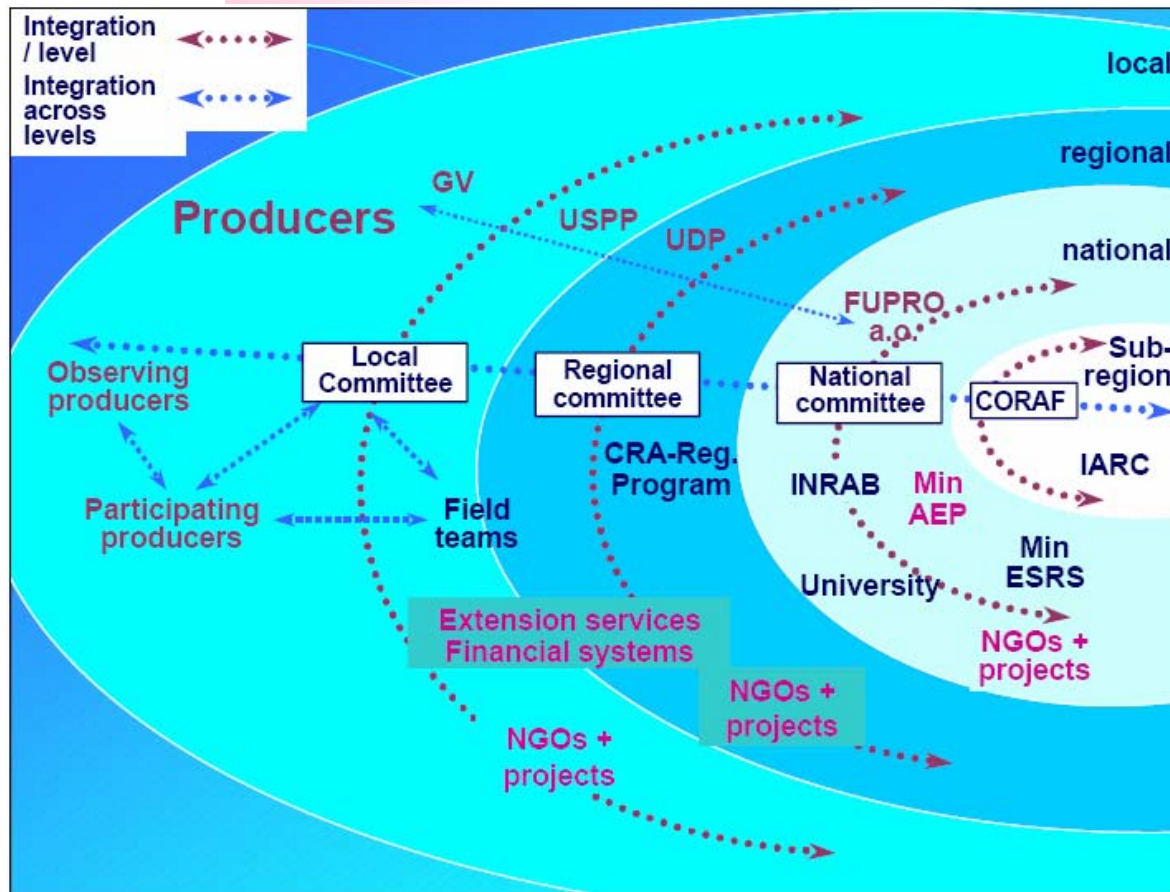
#### **Management cycles proved extraordinarily effective in:**

- Focussing research on needs of resource poor farmers
- Improving scientific quality & efficiency of technology development
- Fostering networking between governmental & non-governmental service providers & producer organizations
- Generating performing & mainly bankable information relevant for extension & credit



# 2 National Systems of Innovation

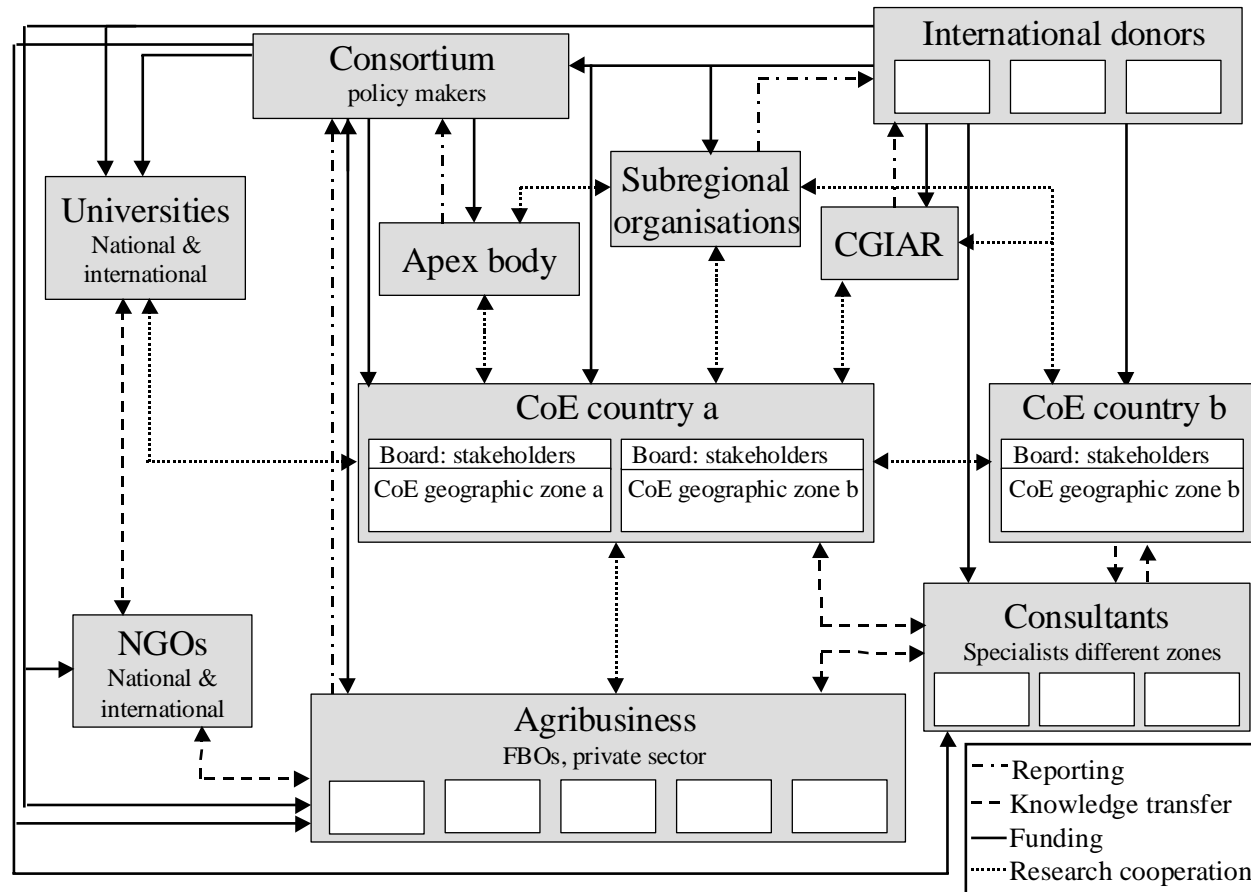
## 2.3.3 Responsibilities and networks: Demand-driven research





# 2 National Systems of Innovation

## 2.4 An integrated Model





Thank you!