



# *Bridging Agricultural Innovation to Policy*

## *Challenges – Strategies - Policies*

*The arguments used in this presentation will be more appropriate to the poorer countries that experience similar difficulties associated with very low levels of development*

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**US**

University of Sussex

SPRU – Science & Technology Policy Research



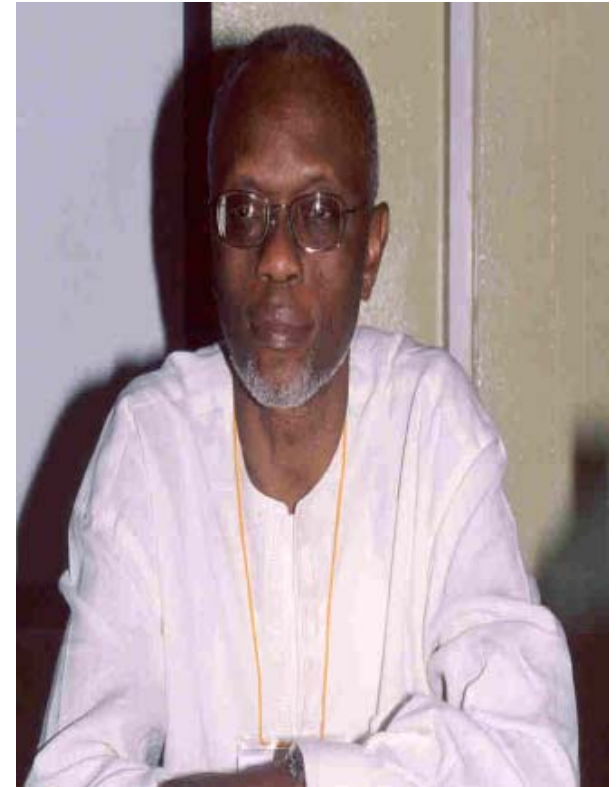
A photograph of a rural landscape. In the foreground, a person wearing a light-colored, long-sleeved shirt and dark pants is walking away from the camera on a dirt path. The path is muddy and appears to be a recently plowed or watered field. In the background, there are utility poles, a road, and a line of trees under a cloudy sky. The overall scene suggests a traditional agricultural setting.

*The man who farms as his forefathers did  
cannot produce much food no matter how  
rich the land or how hard he works..  
technical change is the critical factor in  
raising productivity and the role of the  
government is to promote technical change*

*-Theodore W. Schultz,*

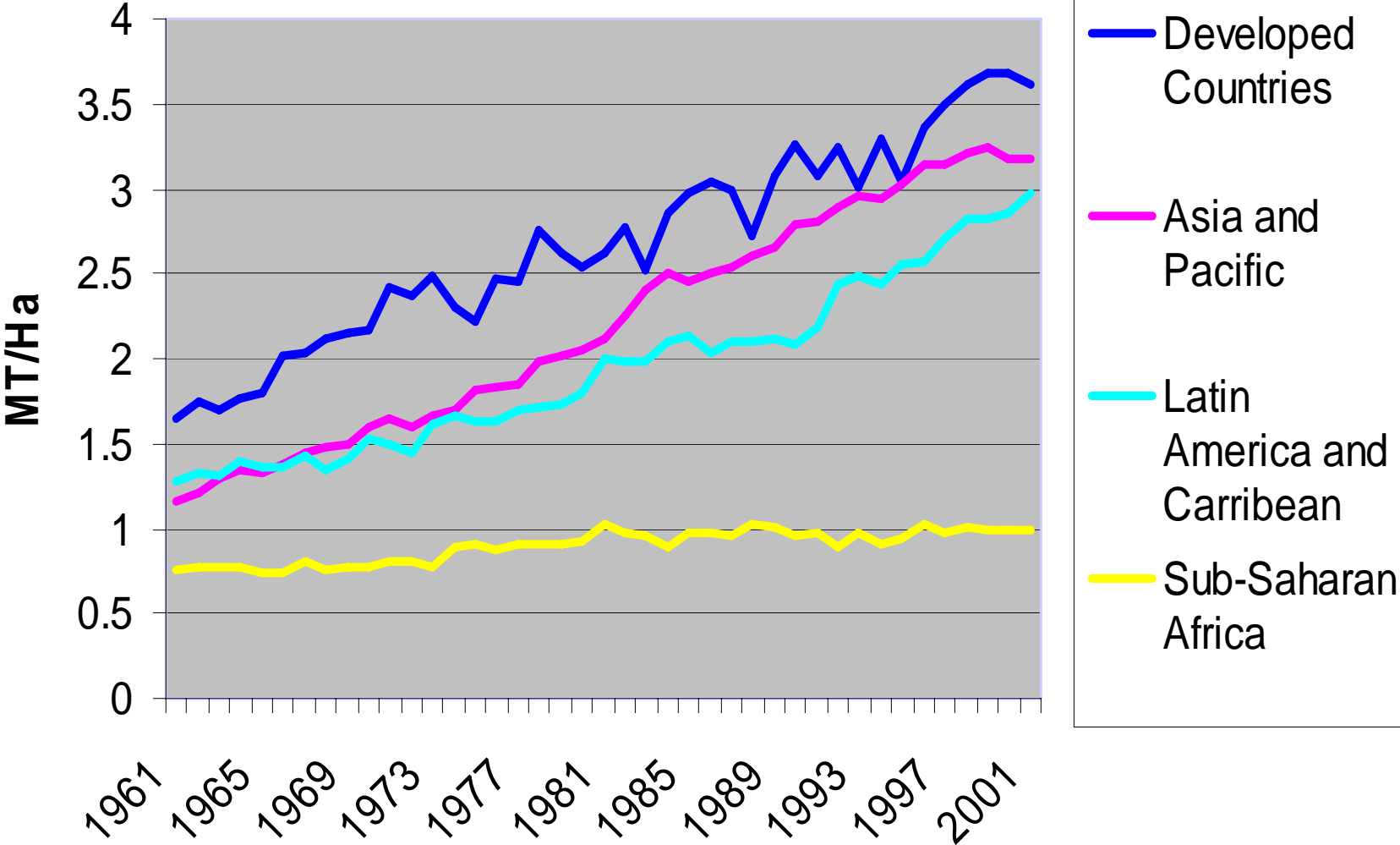
*Transforming Traditional Agriculture, **1964***

**(2005)** One thing that bothered me a lot was the failure to address the question of science and technology more broadly than what we did, **we talk about science and technology as if by themselves they can solve local problems.**



**Akilagpa Sawyerr  
Secretary-General  
Association of  
African Universities  
(AAU)**

# Cereal Yields (MT/Ha)



Comodity	Sub-Sahara		China	India	USA	World
	Farmer	Potential				
Maize	1.2	5.0	4.8	1.6	7.7	3.9
Rice	1.6	4.0	5.9	9.8	6.4	3.7
Sorghum	0.8	2.5	4.0	0.8	4.1	1.4
Wheat	1.6	3.5	3.5	2.4	2.6	2.5

Source: Visions of African Agricultural Research and Development, 2nd SPAARA/FARA Plenary Session. Addis Ababa. 2001

## **TECHNOLOGY TRANSFER**

*The development of a technology in one setting which is then transferred for use in another setting.*

- L. R. Markert,  
*Contemporary Technology, 1993*

## **TECHNOLOGY DIFFUSION**

**The spreading or use of a technology within a society, organisation, or group of individuals.**

- E. M. Rogers,  
*Diffusion of Innovations, 1995*

# KEY SUCCESS FACTORS

**1. Models of transfer**

**2. Linkage policy**

**3. End-user consideration**

**4. Appropriateness**

**5. Breakthrough**

**6. Funding**

**7. Timing**

# 1. TRANSFER MODELS

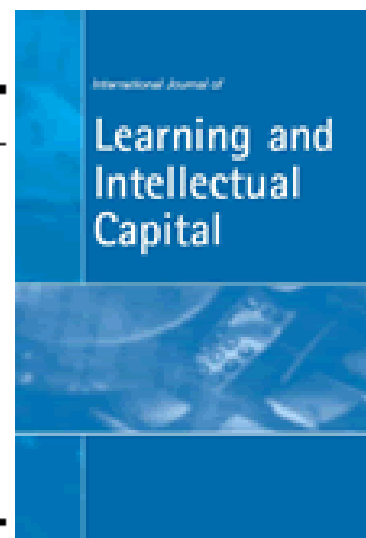
**Table 6** Technology transfer barriers

<i>Reasons</i>	<i>Percentages (%)</i>
Ineffective linkage between research and extension	73
Inefficient and ineffective technology transfer by extension	54
Poor linkage between extension and farmers	49
Others	17
Too scientific technologies for extensionists to understand	17
Extension rejected the technologies for other reason(s)	17
Extension view the technologies as irrelevant for farmers	11



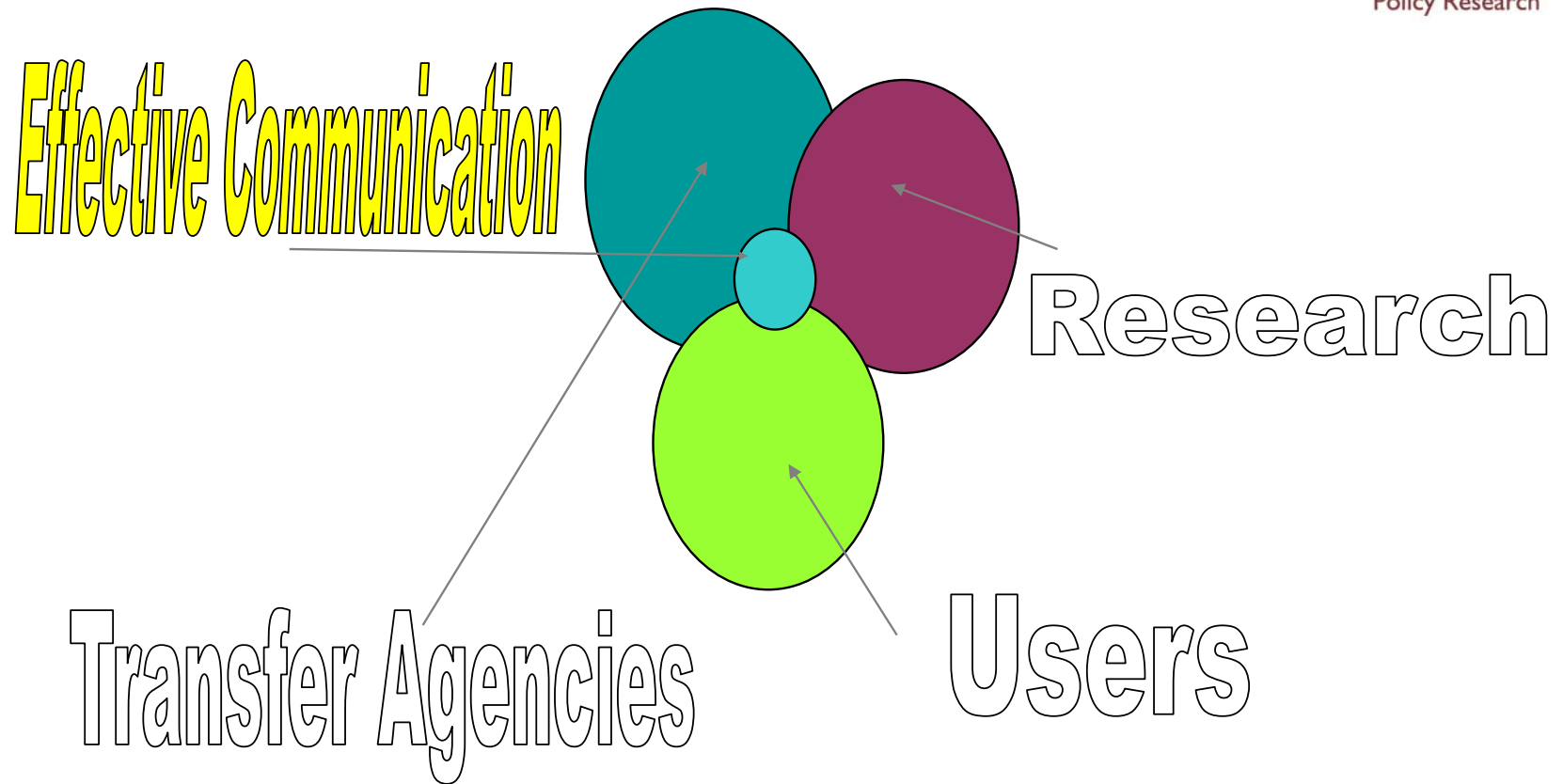
**Table 4** Technology transfer barriers\*

<i>Barriers</i>	<i>Percentage (%)</i>
Ineffective linkage with TAs	98
Inefficient and ineffective TT	58
Poor linkage between TAs and farmers	76
Other reasons	14
Too scientific technologies	24
TAs rejected the technologies	15
Irrelevant technologies for farmers needs	33



**Note:** \*Academic staff have been asked to tick all reasons (*i.e.* can be more than one) with regard to their findings have not transferred to farmers

## 2. LINKAGE POLICY





## AFRICAN PRACTICE

- All research linkages are very poor.
- Missing national research policy.
- Differing research objectives.
- Missing information on ongoing and proposed research.
- Differing organizational structure, especially with regard to planning, coordinating, and monitoring and evaluation; differing qualifications of staff members (degree-level or specialization).
- Differing reward systems.
- Different budgets, rules, regulations, and demands.
- Missing formal linkages.
- Missing incentives for staff members to link (assumption that costs are higher than benefits) as well as competition for available research resources between the institutions.

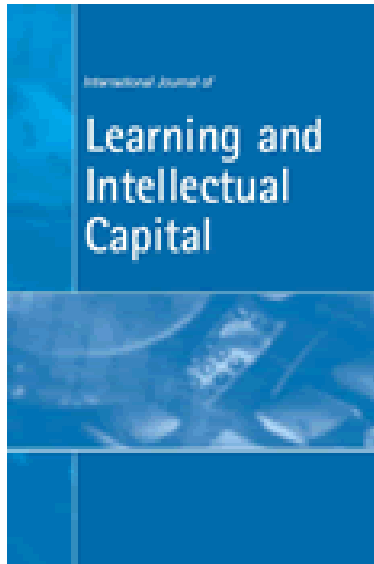
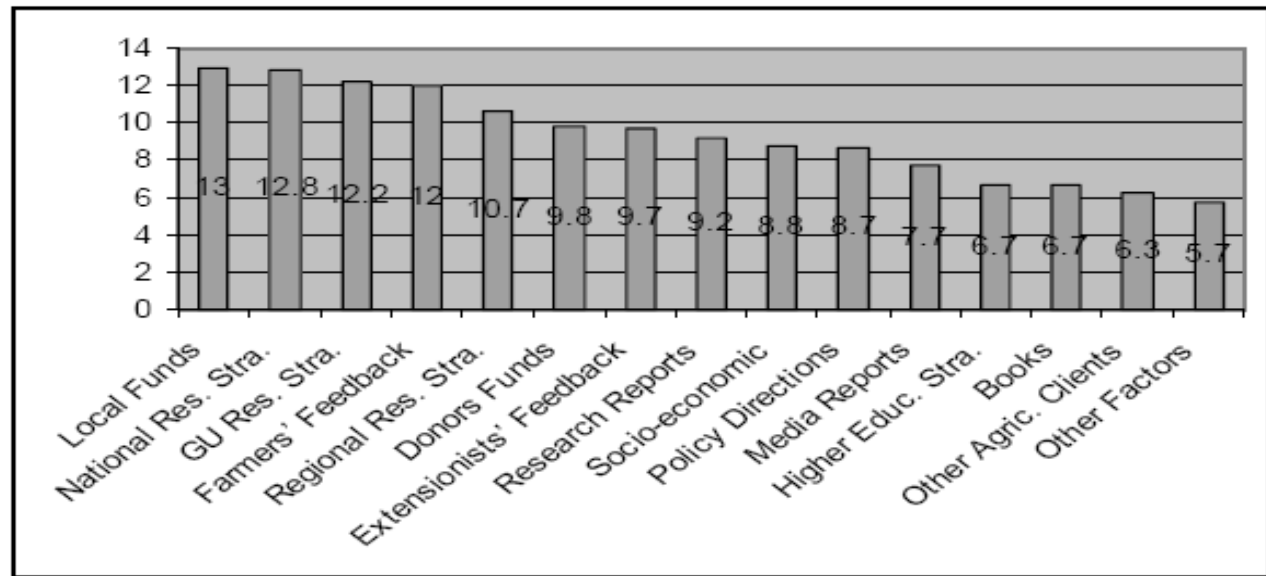
# 3. End-User Considerations



**Table 2** ARC research priorities

<i>Research priorities</i>	<i>Percentages (%)</i>
ARC Strategy	35
National Strategy	25
Farmers' Feedback	14
Local Funds	5
Socio-economic	5
Agricultural Policy	4
Extensionists' Feedback	4
Reports	4
Donors Funds	2
Regional Strategy	1
Other Factors	1

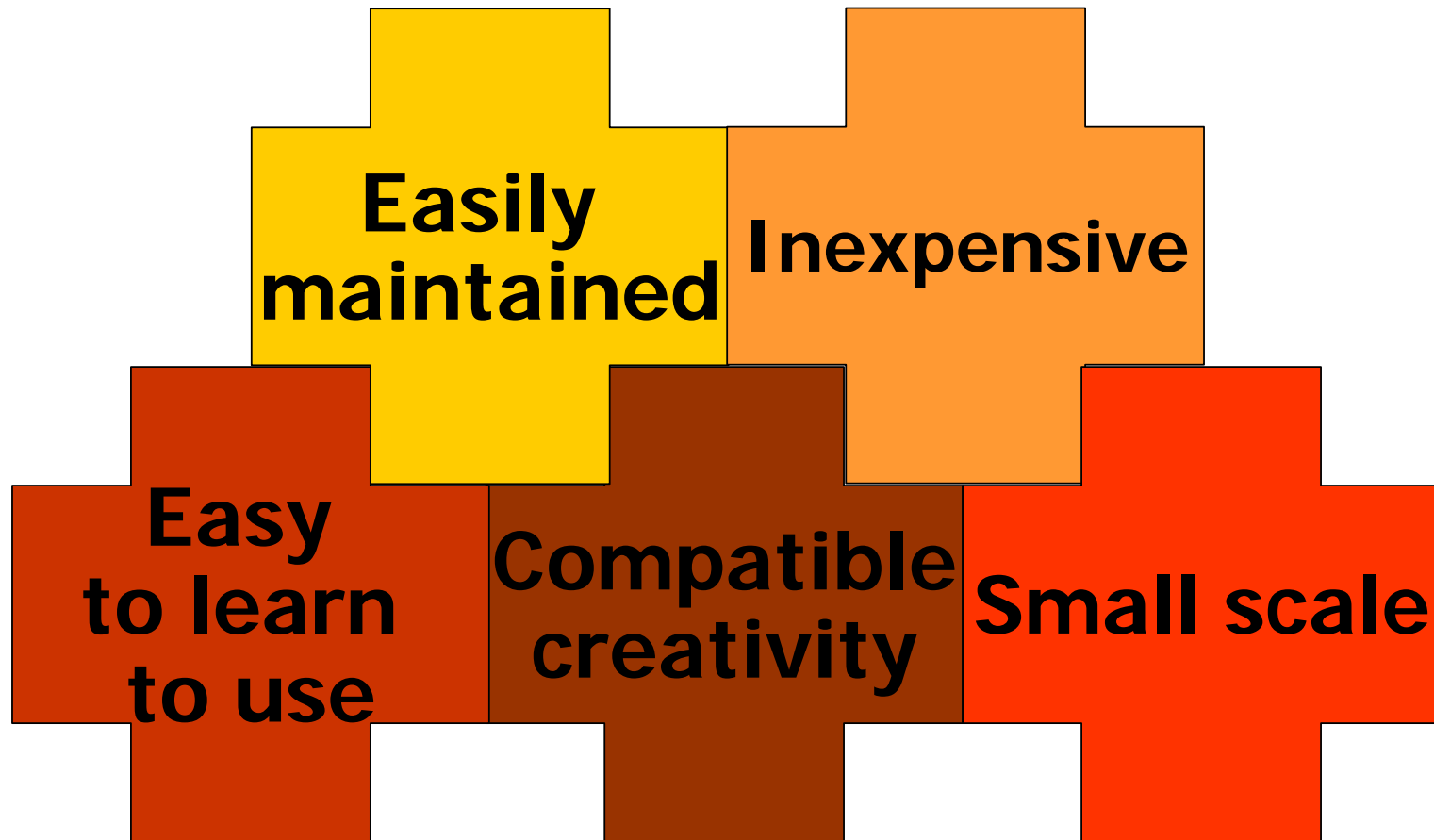
**Figure 1** Research priorities





- Research priorities related to national research needs are absent with missing functions of planning, coordination, and evaluation of research.
- Objectives & projects are largely derived by personal interest basis & rarely reflect the priority needs of rural sector objectives & national development & society goals.
- Universities are not considered as integral elements of national research institutions.
- Universities are under-utilised for research & largely occupied by teaching (*almost 90% of their time*). Incoherent and very weak (MSc and PhD).
- Brain drain.
- Staffing instability (turnover rate in many institutions reaches 10%).
- **How can ordinary users become more involved in decisions about technological change?**
- **What are the major research challenges ahead?**
- **What types of new professionals are needed?**

# 4. APPROPRIATENESS



# 5. BREAK THROUGH

**Table 5** Research findings adopted by farmers

<i>Adoption</i>	<i>Percentages (%)</i>
Yes	45
No	35
Don't know	20

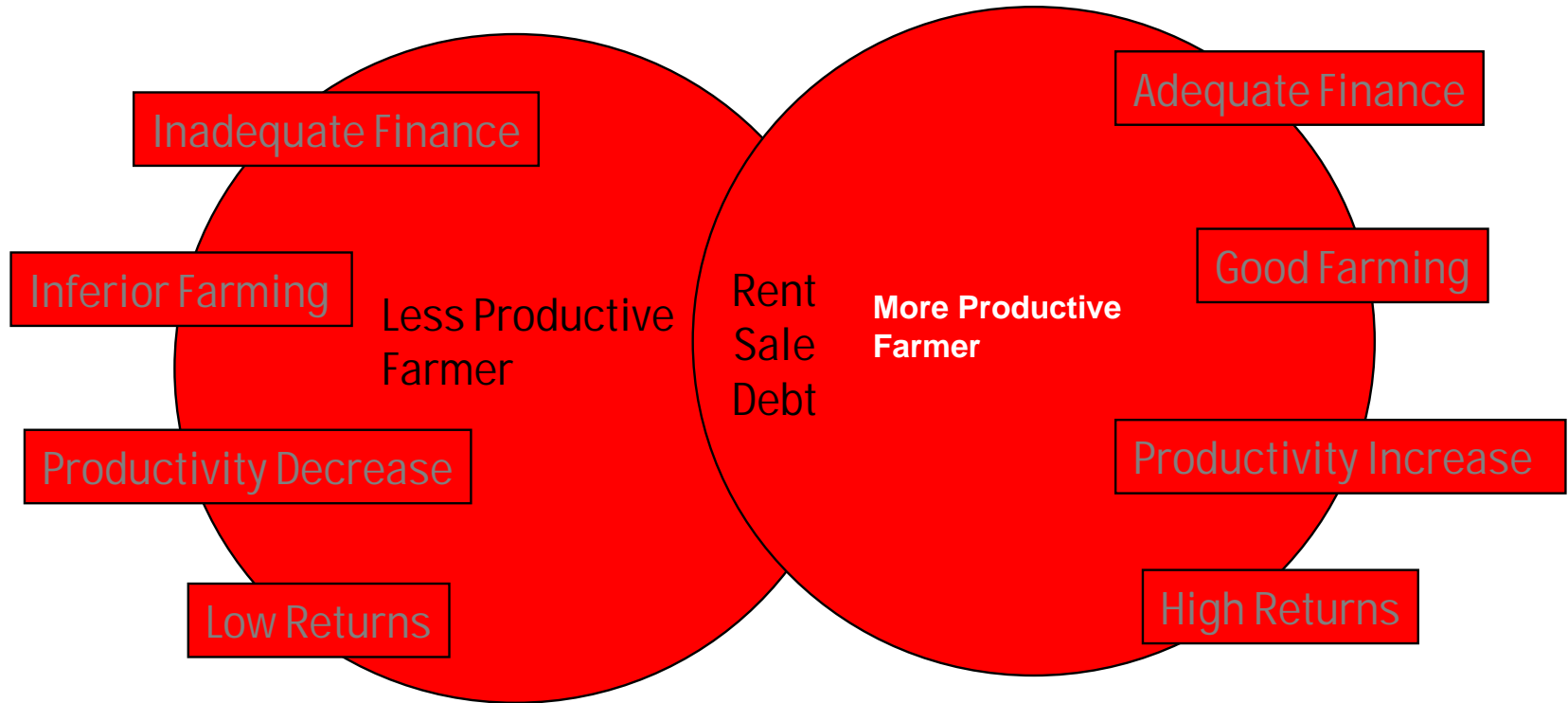
**Table 2** On-site visits

<i>Time</i>	<i>Percentage (%)</i>
Never	33
Other	18
Weekly	15
Every month	12
Every three months	12
Every year	6
Every six months	4

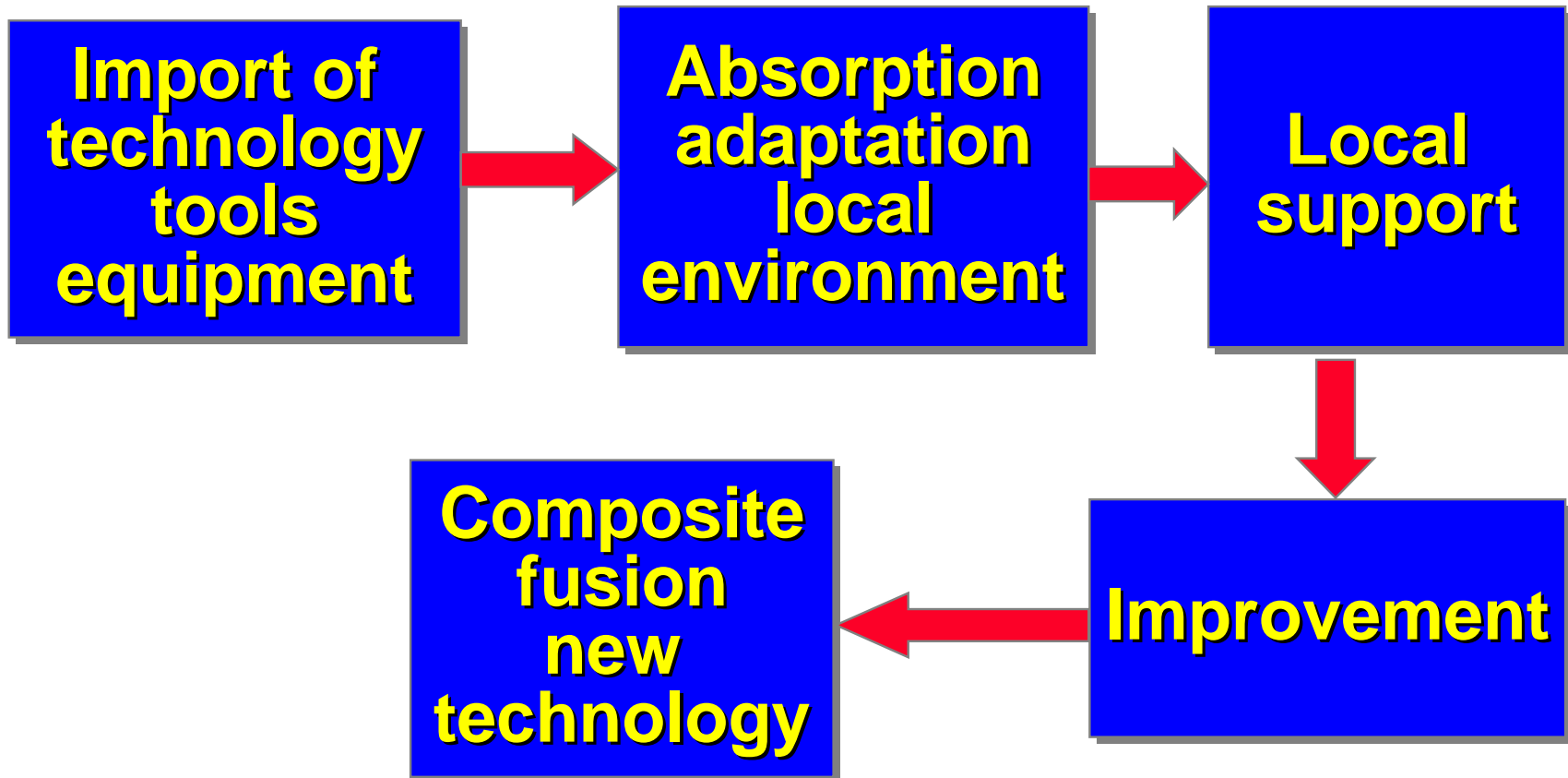


## 6. **FUNDING**

- **Physical, Technical & Institutional requirements.**
- **Adequate national funding to operate public academic & research institutions.**
- **Libraries, documentation centres, computer facilities, laboratory equipment, etc.**
- **Maintenance of all research facilities.**
- **Easy administrative procedures.**
- **Incentives to do research.**



# 7. TIMING





*Is farmers' absorption capacity for technology and agricultural practice changes adequate?*

*Does the implementation system fail to recognise the fundamental economic constraints facing traditional farming systems?*

*Are these key determinants of the productivity gap in Africa?*

# African Poor Progress



- **South Africa has become regional hubs for innovation and technology development.**
- **Small number of multinational corporations involved in technology transfer and commercialisation.**
- **Still inadequate legal framework for commercialisation of different technologies.**
- **No adequate government support for enhancing technology transfer and commercialisation.**
- **Objectives & projects are largely derived by personal interest basis & rarely reflect the priority needs of rural sector objectives & national development & society goals.**
- **Universities are not considered as integral elements of national research institutions; under-utilized for research and largely occupied by teaching (*almost 90% of their time*).**
- **Brain drain.**
- **A growing literature in Africa but it is more fragmented, and often restricted to sector applications or to country specific interests.**



Irrigation Problems




Socio-economic Factors



Accessibility Problems



- 
- *Researchers should communicate better with and understand well the farmers' socio-economic factors and conditions so as to develop appropriate and relevant technologies.*
  - *Researchers must design SIMPLE technologies for the farmers where farmers will be the MAJOR partner in their implementation.*
  - *Technology development success should only be measured by its direct IMPACT on the FARMER's capability to face farming challenges and PRODUCTIVITY INCREASE.*

- ***Governments need to determine levels of continued support to agricultural extension & research.***

***The development of a monitoring, evaluation, and socio-economic analytic capability in research institutions deserves greater policy makers' attention.***

***Better utilisation of academic staff of the different national universities.***

***Adequate funding & subsidies for farming as well as fair returns for farmers produce.***

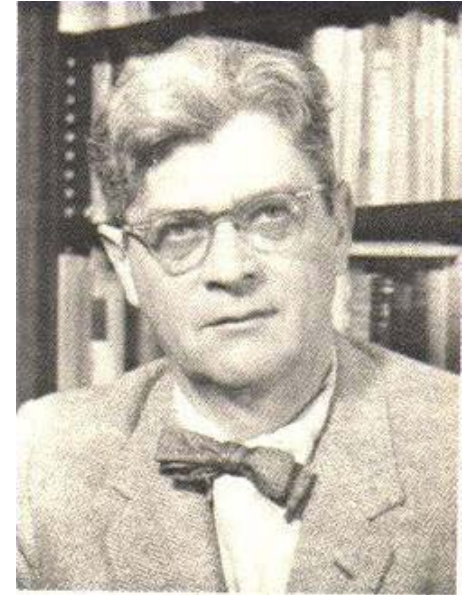


- *Technologies will not succeed without strong TRANSFER system participating from the starting point of the research.*
- *All research, academic and technology transfer organisations must see themselves as part of a single knowledge and information system.*
- *The relationship between universities and research institutions deserves more attention.*



**Alexander Gerschenkron 1904-1978**

(Russian-born, Austrian-trained Harvard economic historian)



**Each country has its own distinctive resources and stage of backwardness – which would strongly influence any potential growth path.....the higher degree of backwardness, the more discontinuous the development is likely to be..**

**1962: Taiwan & Korea GNP = poorer African nations**

**1986: moved up rankings by 47 & 55 places; GDP growth 8% - 10% p.a. (company growth much faster)**

**...most donors are in a rush.** They are in a hurry to have results tomorrow. For instance, people say things like if we can produce this result within 3 years we can reduce poverty. **We must address the issue of context much more carefully....**



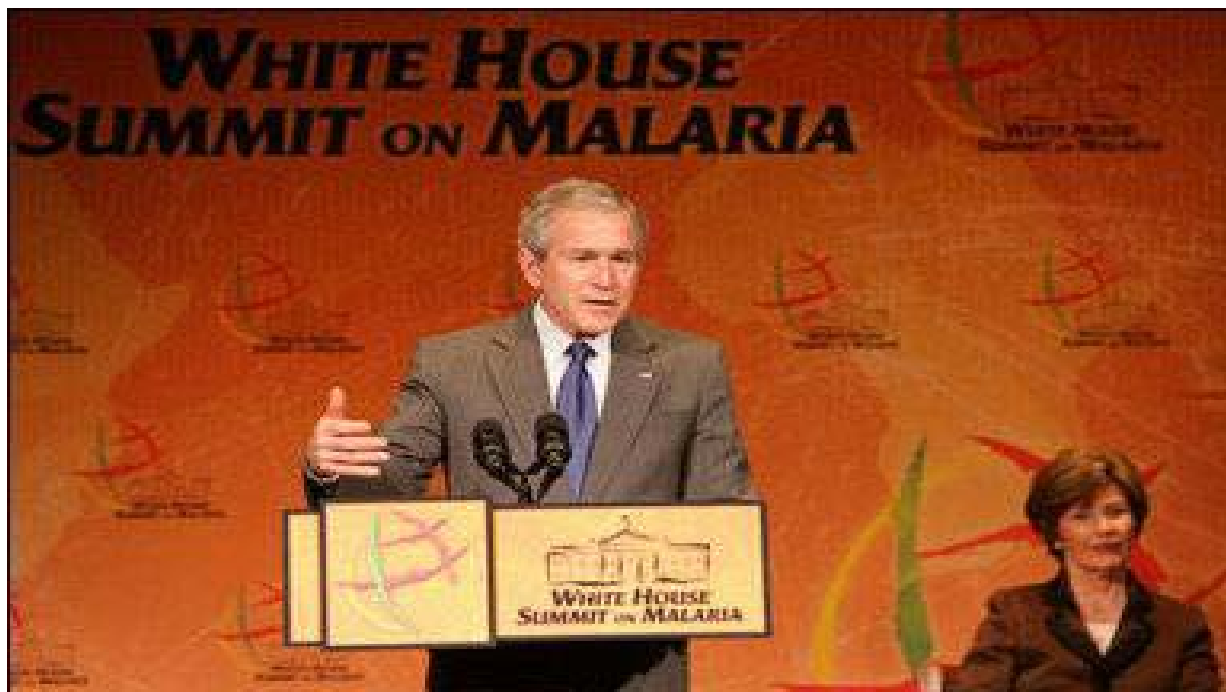
**Miriam Were  
Board Chair,  
African Medical &  
Research  
Foundation**



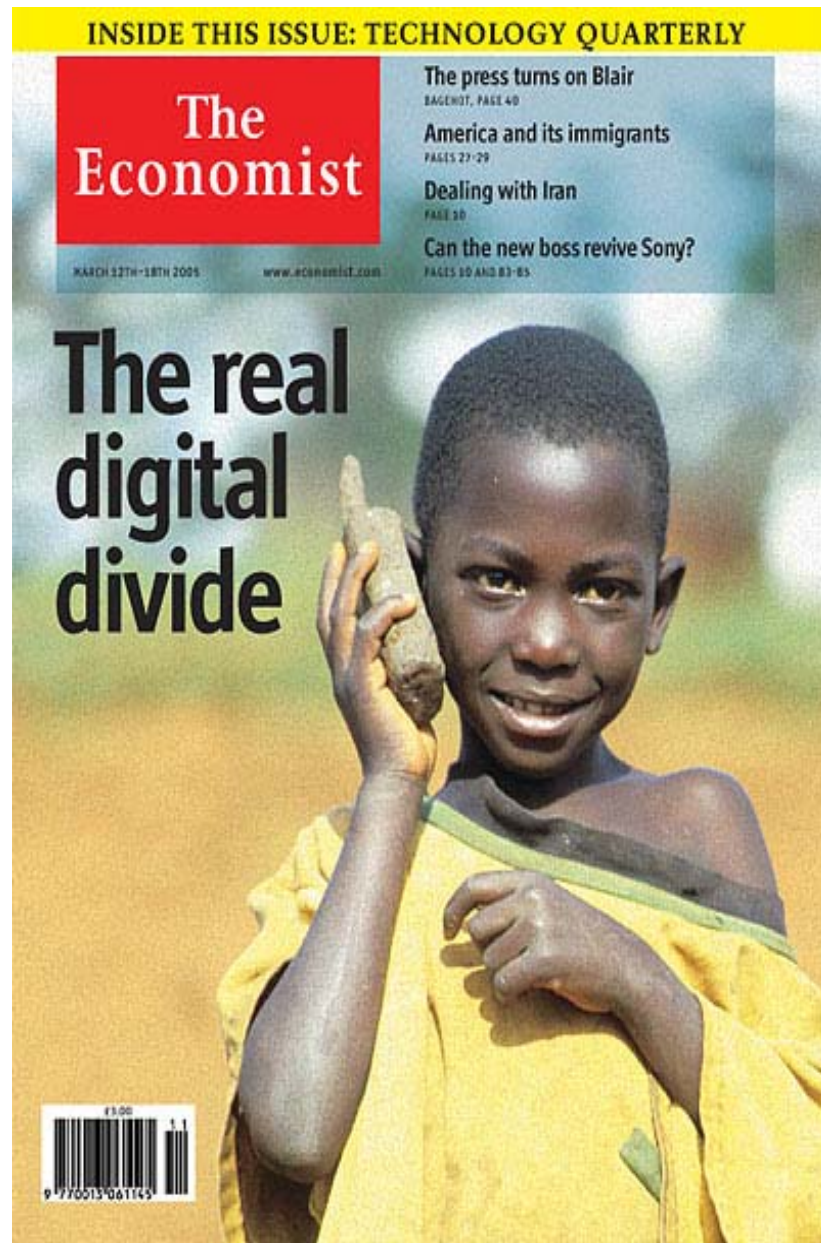
Quite a number of donors decide in the North what they want to do and bring it to Africa and say this is what we think you need. **It is like I come to your house and I tell you, you don't need salt today, you need sugar.** The needs should be discussed in advance and must involve all the sectors, not just the government.



**Gideon Okelo**  
**Executive**  
**Director,**  
**African**  
**Academy of**  
**Sciences**



- Most of the figures towards the set goals/targets are likely to be underestimates due to the weakness of the registration systems and therefore, this should be an urgent call to action.
- Data (ADB, IMF, World Bank, etc) is not available for every country and in some cases not completed.



**Professor Geoffrey Oldham**  
**Former Director of SPRU and**  
**Chairman of the UN Advisory**  
**Committee on Science & Technology**  
**for Development**



“**What next?** ...In last few years *numerous reports* on S&T and Development e.g. WDR, HDR, MDG Task Force, Inter Academy Council etc...each have strengths and weaknesses...need for a *new synthesis*.”

# ***New Ideas....***

- **Applying new ideas to individual country experiences.**
- **Searching for new paths to development which combine local resource advantages with high value added output export opportunities.**
- **Growth paths which embody fairness, employment creation, sustainability.**

# *New Directions*



- Africa must NOT remain essentially a producer of primary goods for the rest of the world.
- “Democratisation” and “popularisation of science and technology.
- Better integration of S&T and innovation policies with overall development policies.
- Strengthening of S&T policy-making & development institutions.
- Building of an efficient S&T infrastructure and strengthened funding, popularisation and extension, as well as managerial, entrepreneurial and innovation capacities.
- Enhancing international cooperation by liaising, networking, partnering & collaborating with industrialised, industrialising & developing countries of other regions.
- Using internationally agreed standards & methods, Africa needs to develop & implement better mechanisms to monitor S&T development within the continent.

# *Final Remarks*

IMF, WB, OECD, EU...



- **Industrial Transformation did NOT result in Africa.**
- **Manufacturing and other industries have grown by only (2%) since 1965.**
- **Urgent review of the anti-farming strategies.**
- **Slowed farm output also slowed foreign exports, led to accumulation of foreign debt.**
- **Don't take on so many tasks that performance is bound to be poor.**
- **Both donors and African governments are guilty.**



Ecuador: \$31.55



Mexico: \$189.09



Bhutan: \$5.03

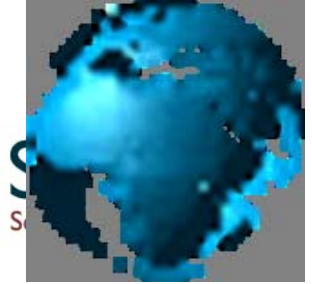


USA: \$341.98

**Chad: \$1.23**



**“People in AFRICA don’t want to live on hand-out. All they want is the opportunity to work themselves out of poverty - and the chance to live dignified and independent lives” OXFAM**



*to be continued.....thank you..*

*Allam Ahmed*

