

Research Gaps and The Way Forward

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"A scientist is a person who knows more and more about less and less, until he knows everything about nothing".

[Ziman, J. 1987]

Outline

1. Gaps/challenges in the thematic areas

2. Mapping and analyzing the research system

3. The Way Forward

- Research policies
- Research prioritization
- Research funding
- Resource pooling
- Research administration
- Partnership and networking
- University-industry linkage
- Thematic research
- Research output/dissemination
- Reform Research

Some gaps/challenges

- A small pool of researchers and technicians;
- Low investment on research/ low funding;
- Low investment on R&D;
- Few research institutes;
- No S&T research institute;
- Very low ICT usage;
- Absence of policy and strategy to promote the development of indigenous technology;
- Weak university-industry linkage;
- No incentives for researchers;
- Low number of publications;

Some gaps/challenges...

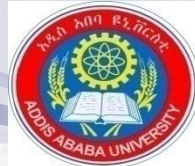
- Policy and strategic issues;
- Weak Capacity for technology generation, promotion and dissemination;
- Inadequate support for the private sector in technology generation and dissemination;
- Inadequate supply of funds and logistics support for technology transfer;
- High management/staff turnover/attrition/ brain drain;

Some gaps/challenges...

- Poor research culture;
- Limited qualified/trained researchers;
- Limited infrastructure for research;
- Absence of properly defined research agenda;
- Lack of system and skills in research management;
- Limited access to scientific publications and publishers;
- Lack of effective mentorship;
- Inaccessible recording and documentation;

Some gaps and challenges...

- Social, gender and environmental history;
- Decline in faculty research and in the quality of graduate and post-graduate research;
- The need for greater research into the state of Ethiopian performing arts;
- Critical issues in Ethiopian education, notably those of quality, equity, efficiency and medium of instruction;
- Mainstreaming of Ethiopian studies into the general Africanist discourse.



Research is imperative!

- A key function of research institutes and higher education institutes;
- A cornerstone of scientific innovation at national, regional and international levels;
- The need for mapping analyzing the research system of the country;
- Identify major challenges seek for solutions.

Reluctance to support research

- Other areas require more urgent attention;
- Policy attention is directed towards the provision of basic education and health care;
- The results and long term impact of research are poorly understood;
- Frequent suggestions for problem-solving *via* simple transfer and adaptation of strategies.



Mapping and analyzing the research systems

SWOT analysis of Research at AAU indicated:

- Research at AAU is fragmented, non-integrated, does very little to improve life and fails to exceed customers' expectations;
- Research does not focus on customer demand and national development agenda;
- Research is either based on individual initiative or donor-driven;
- Research is not scientifically sound, inventive, and innovative. The quality of research at AAU is inadequate;

(Strategic Plan 2006/07 and BPR 2009)

Mapping and analyzing the research systems...

- Research process is too bureaucratic and centralized;
- Dissemination and applications of research outputs are limited. Outputs that reach end users are limited;
- Research and teaching-learning are conducted independently (not complimentary). There is lack of linkage between research and teaching-learning;
- By and large, research is carried out for promotion purposes; and only a few undertake research to remain competent in the field of their specialization.

(Strategic Plan 2006/07 and BPR 2009)

Research policies

- National Research Policy
 - Policies on sectors
 - Priority areas
 - e.g. National Health Science & Technology Policy
- Institutional policies;
- Policies to balance fundamental and applied research;
- Policies to support local development.

Research prioritization

What should be the criteria?

- Basic? Applied?
- Multidisciplinary, Transdisciplinary, Integrated?
- Problem-solving?
- Originality, Innovative?
- Adaptive, Reverse engineering?

Examples of priority areas

- Population growth
- Food security
- Primary health care
- Environmental degradation
- Water management
- Energy

Ethiopia at a cross-road

The World Bank has benchmarked a population growth rate of 2% per year as a level beyond which it is difficult for a country's institutions and technologies to keep up with expanding population pressures on all sectors, from water, sanitation, and agriculture to health, housing, and education.

**Source: Ringheim, K., Teler, C. and Sines, E. (2009), Ethiopia at a Crossroads: Demography, Gender, and Development Population Reference Bureau, Washington D.C.*

Ethiopia-Demography

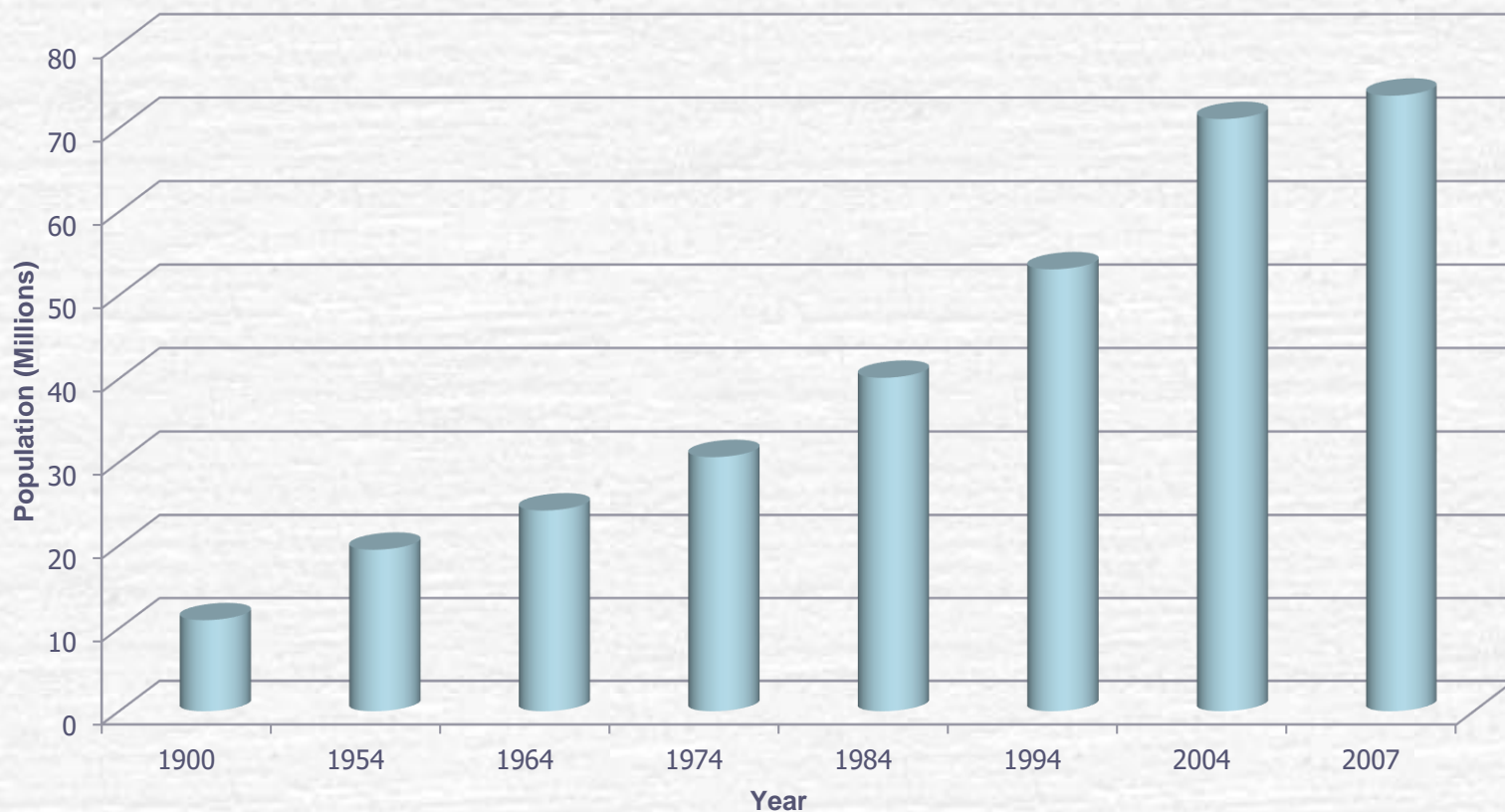


Fig: Population growth in Ethiopia over the past century Ethiopia (Source: Ministry of Finance and Economic Development, *Population and Development Ethiopia* 12, No. 1 (2008))

Ethiopia- Demography...

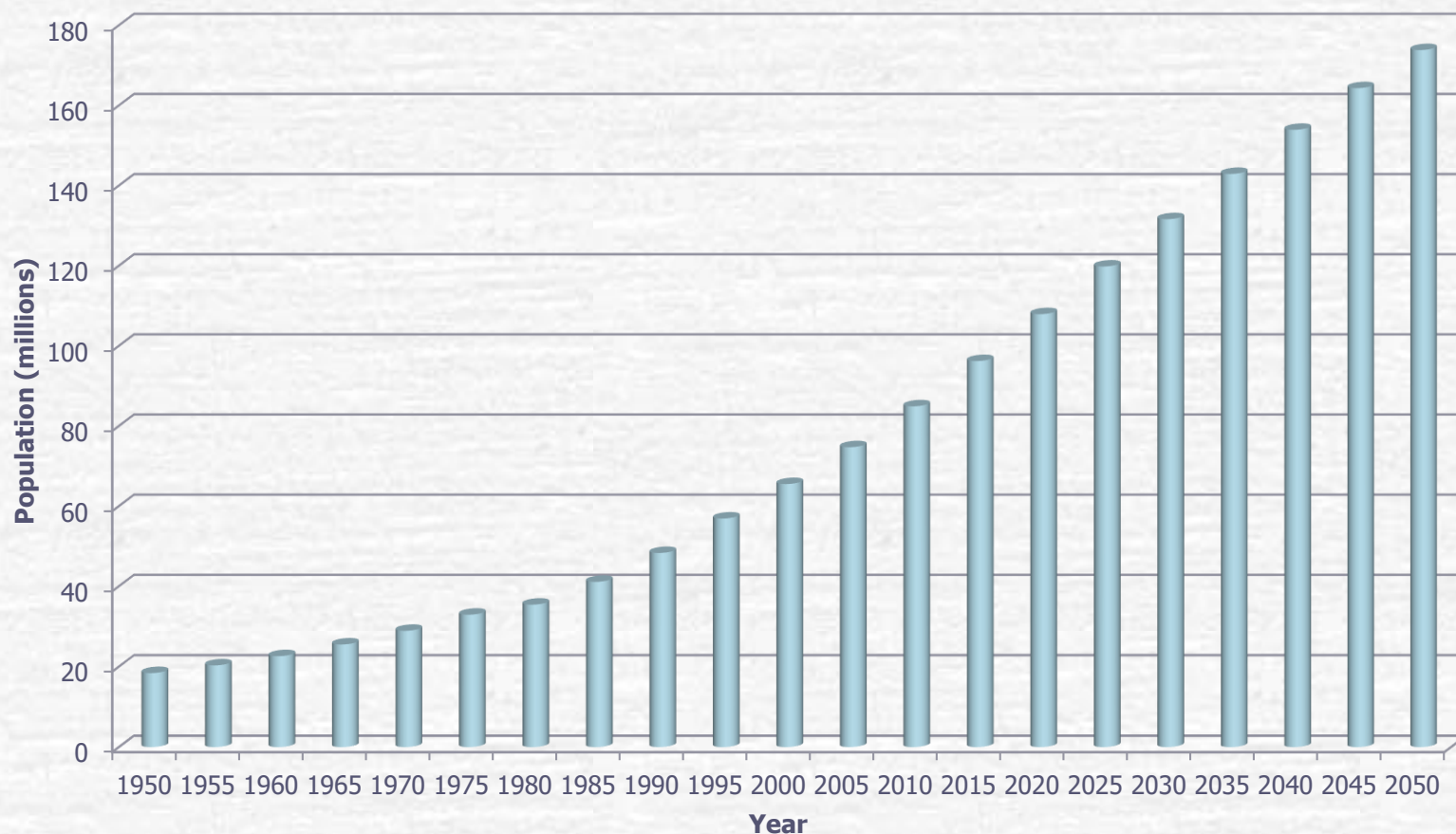


Fig: Population growth in Ethiopia (1950 – 2050)

Ethiopia- Demography...

- Second-largest country in Africa (~ 80 million)
- Growth rate 2.6%/year
- Increment of 2 million people/year
- Predominantly rural (84% residing in rural areas)
- Predominantly young population (45% under age 15)
- Only 3.2% above age 65

PHC-Health Extension Program

The HEP promotes 4 areas of care:

A) Disease Prevention and Control

- HIV/AIDS prevention and control
- TB prevention and control
- Malaria prevention and control
- First AID

B) Family Health

- Maternal and child health
- Family planning
- Immunization
- Adolescent reproductive health
- Nutrition

Health Extension Program...

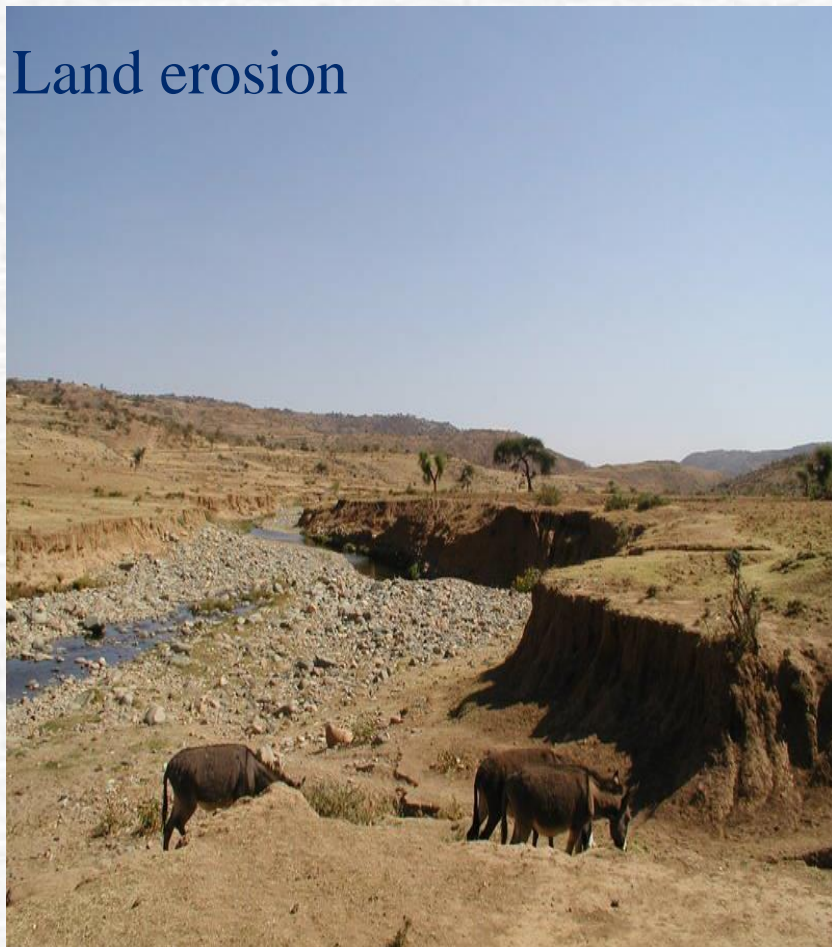
C) Hygiene and Environmental Sanitation

- Personal hygiene
- Healthy home environment
- Water supply safety measures
- Food hygiene and safety measures
- Proper and safe excreta disposal system
- Proper and safe solid and liquid waste management
- Arthropods and rodent control

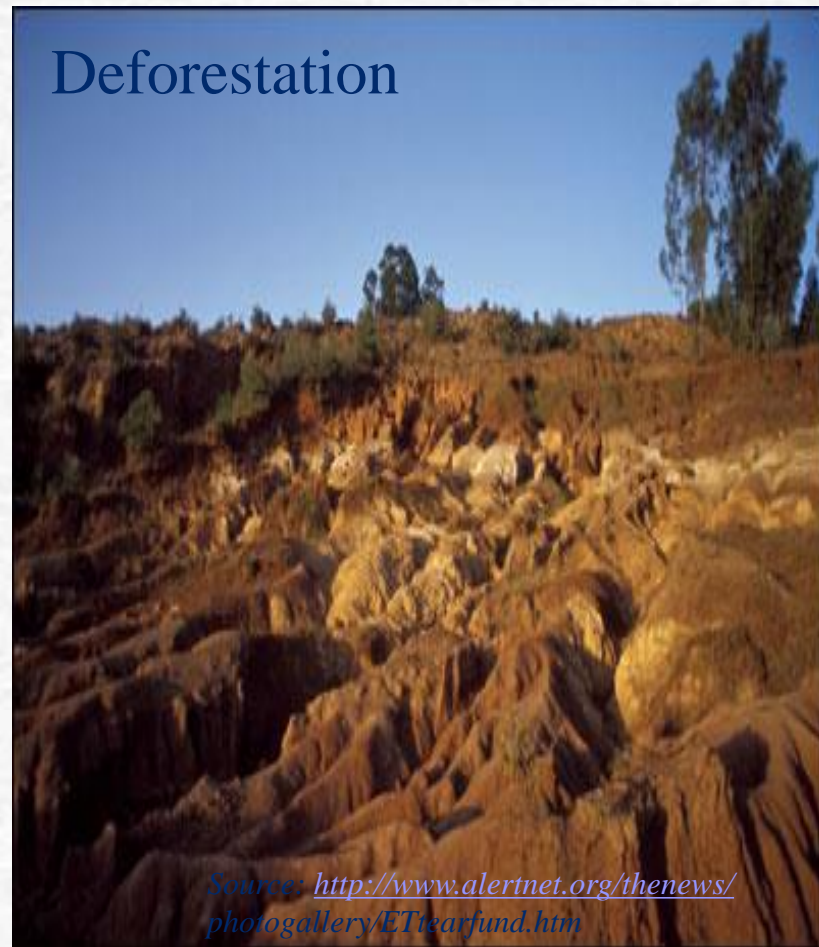
D) Health Education and Communication

Ethiopia- Environmental degradation

Land erosion



Deforestation



Source: <http://www.alertnet.org/thenews/photogallery/ETtearfund.htm>

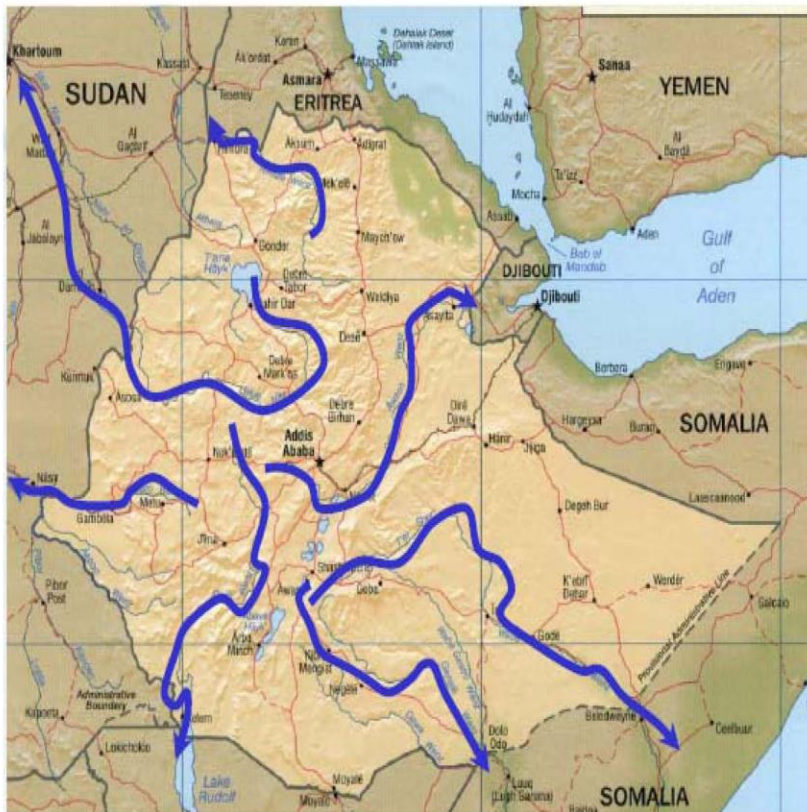
Overgrazing, deforestation, and poor agricultural practices

Land- rehabilitation



*Tigray –Adinefas: land rehabilitated due to integrated intervention,
Source: EEPA, 3rd National report., Feb 2004*

Water- Is Ethiopia the water tower of Africa?



Courtesy © 2006 Faraz Naqvi

Water Supply- Ethiopia

- 12 major river basins with an annual runoff volume of 122 billion m^3 of water and an estimated 2.6 - 6.5 billion m^3 of ground water potential*
- Per capita = 1575 m^3 of physically available water
- But, water is often unavailable
- Only ~ 3% of water resources are used, of which only ~ 11% (0.3% of the total) is used for domestic water supply

**Source: Ministry of Water Resources*



Source: <http://benryu.files.wordpress.com/2010/01/ethiopia-teach-1.jpg>

Energy

- Household- electrification low coverage
- Extensive use of wood
 - Wood famine
 - Deforestation (soil erosion)
- Animal dung (used for energy)

Energy- Wood and charcoal for cooking



Source:

[http://www.trekearth.com/gallery/Africa/
Ethiopia/South/Adis_Abeba/](http://www.trekearth.com/gallery/Africa/Ethiopia/South/Adis_Abeba/)

*Illegal charcoal production is a major cause of
deforestation*

Energy- Wood and charcoal for cooking...



*“**Gounzie**” (closed Enjera Stove) efficiency about 47% during test (EREDPC), Source: EEPA, 3rd National report., Feb 2004*



*“**Laketch** Charcoal Saving Stove” in operation (EREDPC), Source: EEPA, 3rd National report., Feb 2004*

Energy- Solar for cooking



Source: solarcooking.wikia.com/wiki/Ethiopia

Energy- Alternative

Wind energy

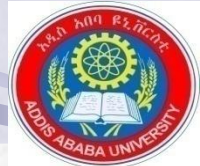


Source: <http://www.wri.org/climate>,
World Resources Institute

PV Solar energy



<http://www.aboutmyplanet.com>



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The Way Forward

Research policies

- Review the existing policies to address developments and gaps;
- Put in place directions and guidelines;
- Put in place mechanisms for monitoring and evaluation.



Research funding

- The Government should allocate a reasonable proportion of national budget for research;
- Mobilize resources- the private sector, community;
- Attract international funds on the basis of partnership (exploit the comparative advantage we have).

Resource pooling

- HR
- Research Facilities
- National laboratories
- Core laboratories
- Multidisciplinary
- Thematic Research

Research administration

- Establish National Research Council
 - Role of EAS
- University Research Council
- Prioritization
- Performance evaluation system
- Quality assurance



Partnership and networking

- Forging links with stakeholders;
- Conducting collaborative research;
- Joint-sponsoring research;
- Research involving the community.

University-industry linkage

- *Knowledge generated by research is the basis of sustainable social development, and therefore,*
- *Research should find socially relevant application.*
- *This requires placing knowledge, at the service of development and converting it into value via applications.*
- Foster University-industry partnership
- Establish incubation centers
- Techno-parks
- Implement research outputs

University-industry linkage...

- *Develop start-up companies by providing entrepreneurs with an array of targeted resources and services*
- *Facilitate entrepreneurs with laboratories, extensive libraries, computer systems, technology expertise, a well-educated workforce and subject matter experts*

Thematic research, why?

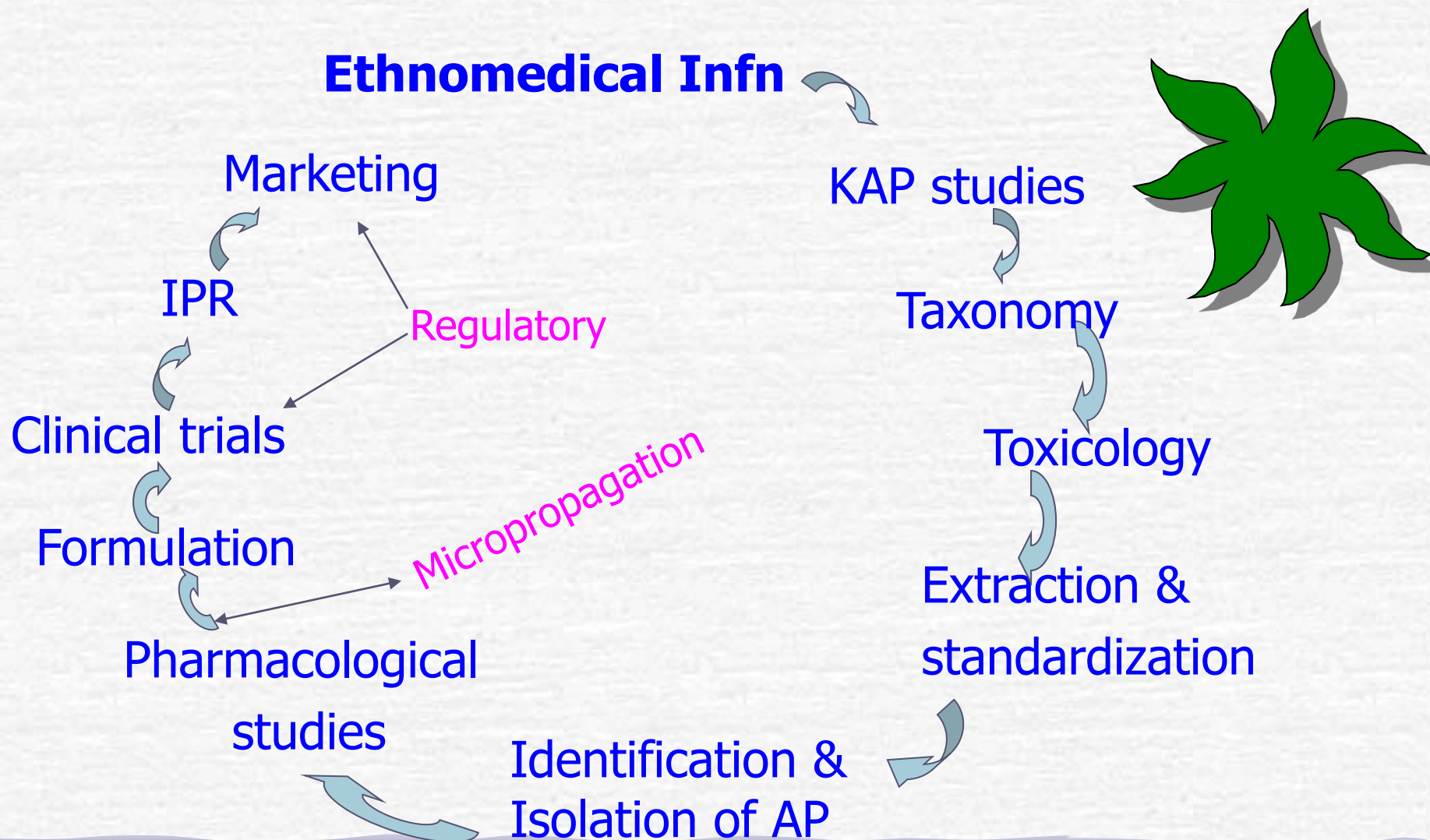
- *"The predominance of fragmented learning/research divided up into disciplines often makes us unable to connect parts and wholes", this should be replaced by learning/research that can grasp subjects within their context, their complexities, their totality.**

**Morin, Edgar, Seven complex lessons in Education for the Future, UNESCO, EPD-99/WS/3, Paris, 1999, p.8.*

Thematic research, why?

- Fosters cross-disciplinary research;
- Promotes a profound understanding of cross-cutting issues or issues that require detailed studies;
- Encourages researchers to become more involved in interdisciplinary and cooperative research programs;
- Enhances networking;
- Contributes significantly to research outcomes with clear potential for
 - Advancement of science and technology;
 - Social or cultural benefits;

Development of phytomedicine from local herbs



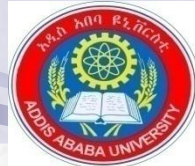
Research output/dissemination

- Journals
 - Local
 - International
- Translation of knowledge
- Mass media
- Seminars
- Workshops
- Communication language (s)

Reform research

"It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change".

(Charles R. Darwin).



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Thank You!