



SCIENTIFIC DATA AND SUSTAINABLE DEVELOPMENT

22ND INTERNATIONAL CODATA CONFERENCE

24-27 OCTOBER, 2010

STELLENBOSCH, CAPE TOWN, SOUTH AFRICA



African Traditional Medicines and Indigenous Knowledge Systems



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Core message:

Building a digital library of African Traditional Knowledge
through existing databases and networks,
and translating data into innovation

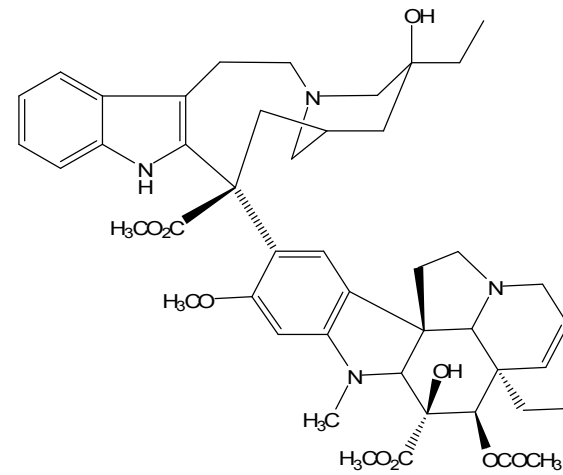
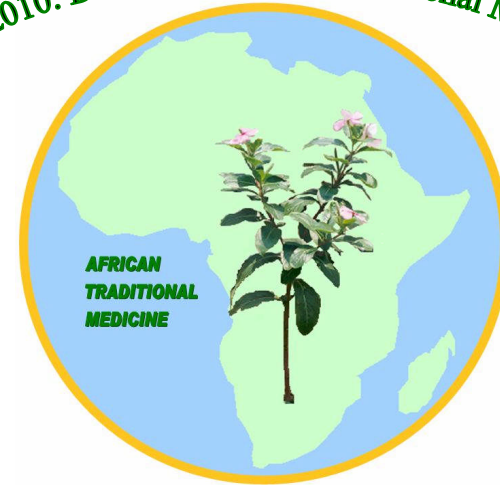
Presentation outline

- ➔ Brief background of Biodiversity and African Traditional Medicine
- ➔ Existing Databases on African Medicinal Plants
- ➔ Existing Networks on Traditional knowledge and related subjects in Africa
- ➔ Critical analysis
- ➔ Which way forward?



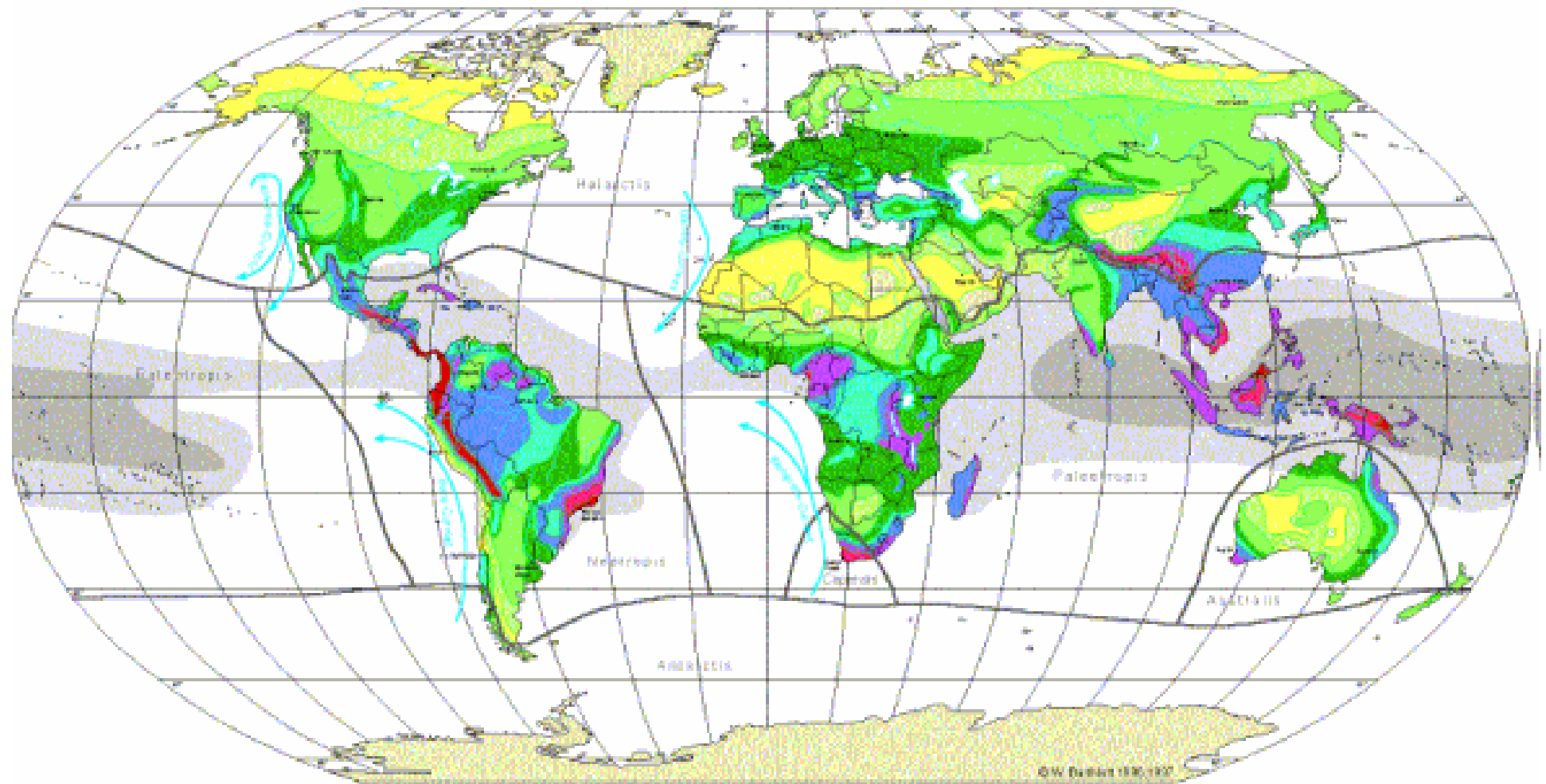
Biodiversity is Life

2001-2010: Decade of African Traditional Medicine



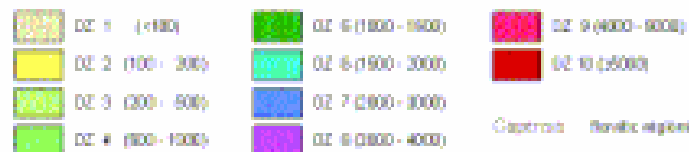
Madagascar periwinkle:
Source of anticancer drugs
Vinblastine and Vincristine

GLOBAL BIODIVERSITY: SPECIES NUMBERS OF VASCULAR PLANTS



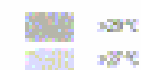
Robinson Projection
Standard Parallels 30°N and 30°S
Scale 1: 60,000,000

Diversity Zones (DZ): Number of species per 10,000km²



Caprosia: Borealis region

Sea surface temperature



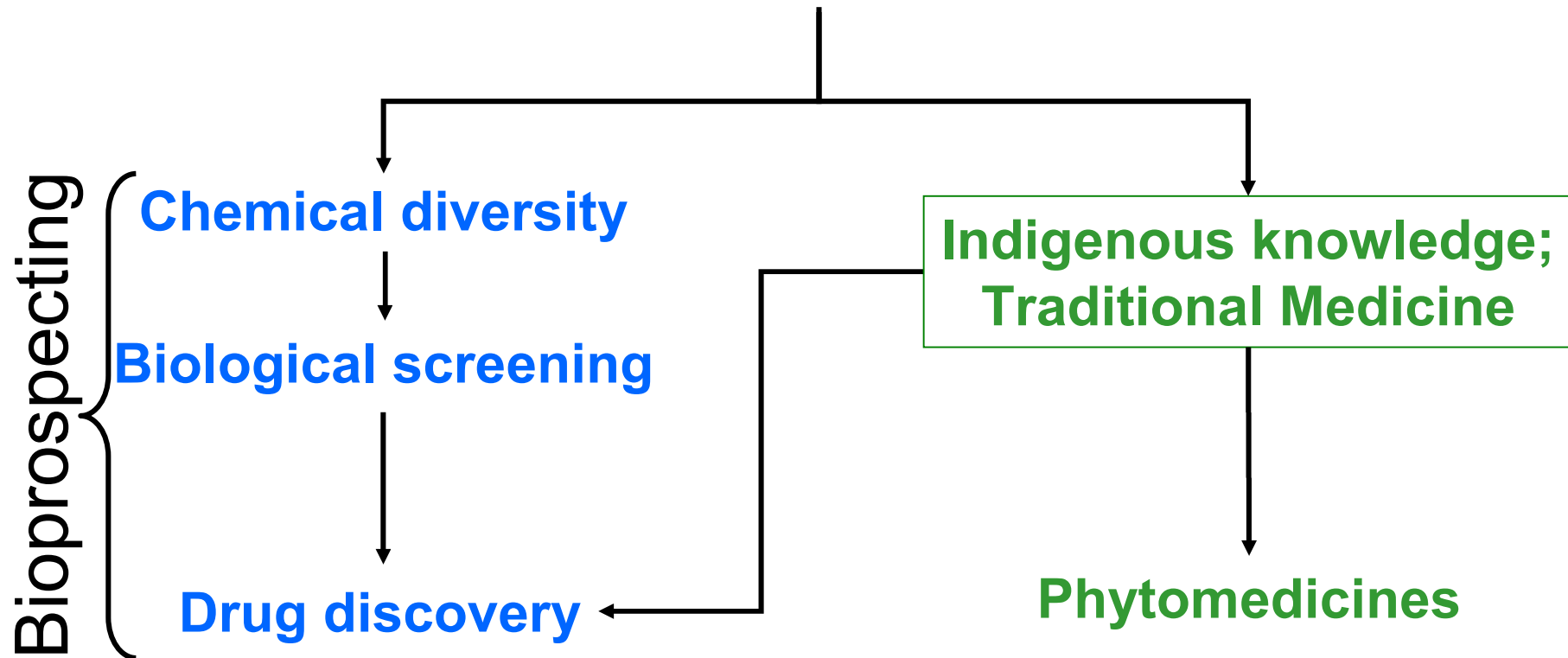
 cold currents

W. Barthlott, G. Heidegger, G. Brown,
F. Paig, O. Hen, W. Lauer & J. Mathe 1997
modified after
W. Barthlott, W. Lauer & A. Stadler 1995
Department of Botany and Geography
University of Bonn
German Aerospace Research Establishment, Cologne

Cartography: M. Graf
Department of Geography
University of Bonn

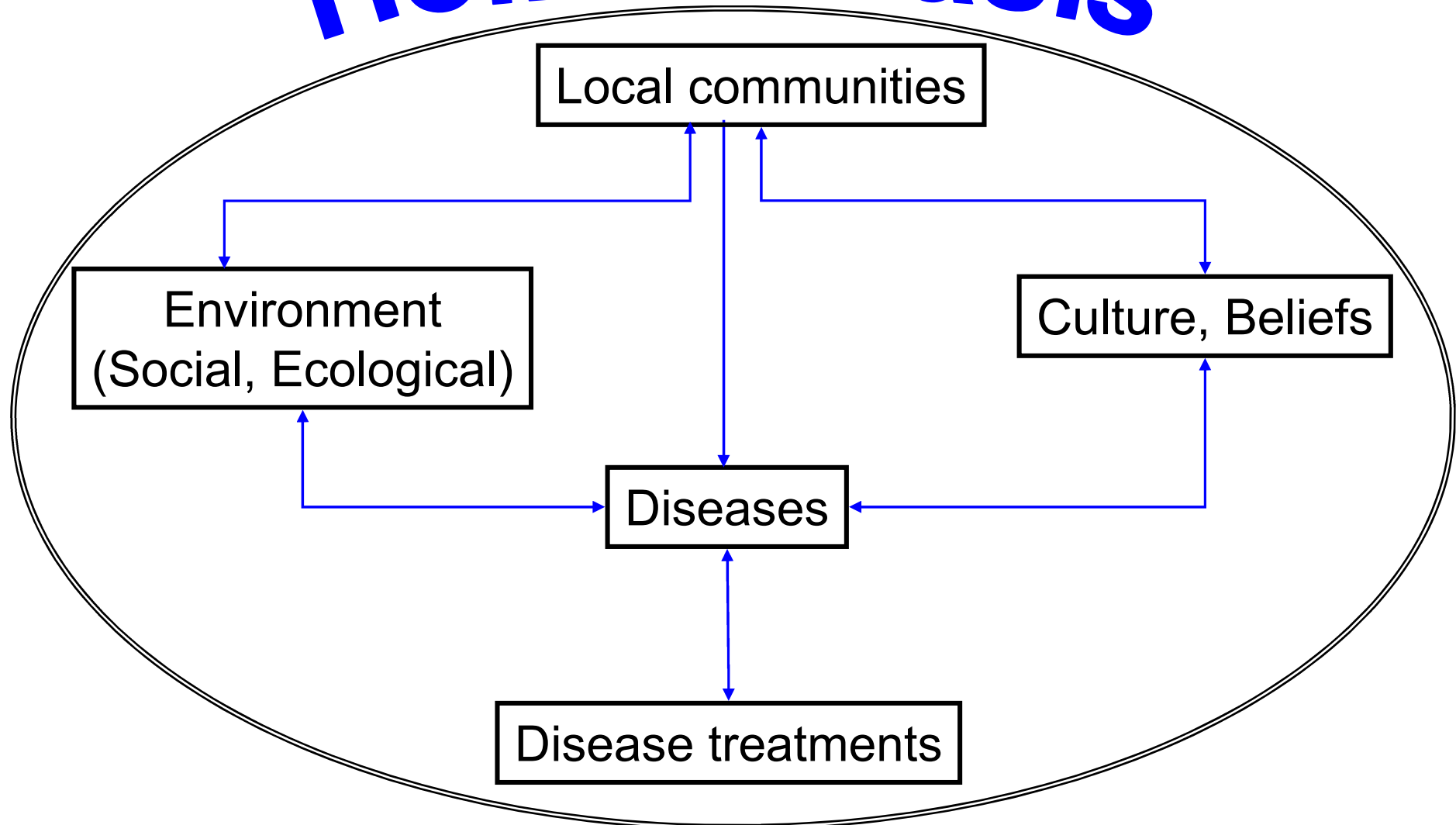
Vast amount of African biodiversity waiting to be translated into new therapies

African Biodiversity



African System of Traditional Medicine

Holistic basis



Disease treatments

Spiritual
(Diviners)



Physical
(Herbalists)



Pretoria, 2005

Databases on African medicinal plants

I- Francophone database

PHARMEL (PHARMACOPÉE ET MEDECINE TRADITIONNELLE) **Database**
on African Traditional Medicine and Pharmacopoeia

- 19,691 recipes from 24 African countries;
- 4000 medicinal plants recorded;
- 51 references.

<http://www.ulb.ac.be/sciences/bota/pharmel.htm>

- Adjanohoun E., Cusset G., Issa LO, Keita A., Le Bras M., Lejoly J.
Agence de Coopération Culturelle et Technique (ACCT).
- Laboratoire de Botanique Systématique et de Phytosociologie, Université
Libre de Bruxelles, CP 169, 50 Avenue F. Roosevelt, 1050 Bruxelles, Belgique.
E-mail: jlejoly@ulb.ac.be

Databases on African medicinal plants

II- Bilingual databases

PRELUDE Database on traditional veterinary and human medicine plants in sub-Saharan Africa.

This database contains information on **thousands of plants** used for treating animals and humans in rural areas in different regions of Africa. Each listing includes, among other things, the plant's botanical name, the African countries where the plant is used for veterinary purposes, and the animal diseases it is used for.

<http://pc4.sisc.ucl.ac.be/prelude.html>

- Jean Lehmann, Laboratoire de botanique médicale de l'Université de Louvain, Institut Carnoy, 4 place Croix du Sud, 1348 Louvain-la-Neuve, Belgium.

E-mail: lehmann@fyndu.ucl.ac.be

Databases on African medicinal plants

II- Bilingual databases (cont'd)

PROTA (Plant Resources Of Tropical Africa) DATABANK.

The PROTA databank is the basic output of the program to survey, compile, edit, publish and disseminate existing knowledge on some **7000 useful plants** of Tropical Africa with estimated **200,000 references**, an estimated **30,000 photographs** and drawings and 6,000 geographic distribution maps

<http://www.prota.org/PROTASTartframes.htm>

Wageningen University (WU), Haarweg 333, PO Box 341, 6700 AH
Wageningen, the Netherlands.

E-mail: PROTA@pros.dpw.wag-ur.nl

Databases on African medicinal plants

III- English databases

TRAMED (**T**raditional **M**edicine **D**atabase).

The Traditional Medicines Database incorporates: material gathered from the contemporary scientific literature on medicinal plants and their pharmacology and toxicology; material from collections, such as books, published articles, theses and databases already available, concentrating on African plants.

<http://www.healthnet.org.za/tramed/gen/tramedsearch>

- South African Traditional Medicines Research Unit, Department of Pharmacology, Faculty of Health Sciences, **University of Cape Town**, 7925 Observatory, South Africa.

E-mail: satmerg@uctgsh1.uct.ac.za

Databases on African medicinal plants

III- English databases (cont'd)

NTRAP (The Database of **N**atural & **T**raditional **P**esticidal Materials Pest Control in Sub-Saharan East Africa).

This database covers both natural products used, and with potential uses, for crop protection in sub-Saharan East Africa. The majority of these products are botanicals.

<http://www.ippc.orst.edu/ipmafrica/db/index.html>

- Dr. Richard E. Ford, Executive Director, CICP, N417 Turner Hall, University of Illinois, 1102 S. Goodwin Avenue, Urbana, IL 61801, U

Databases on African medicinal plants

IV- National Databases from institution initiatives

CESRIKI (Center for Scientific Research, Indigenous Knowledge and Innovation)

Based at the University of Botswana, CESRIKI has an ongoing project to document Botswana's IK systems and is working with nearly **100 IK owners** and has constructed a 'smart-system' database.

IMRA (Institut Malgache de Recherches Appliquées)

IMRA has a database containing a computerized ethno-botanical data of over **4000 Madagascan plants**.

Networks on Traditional knowledge and related subjects in Africa

The **A**frican **E**thnobotany **N**etwork/ Le Réseau Africain d'Ethnobotanique

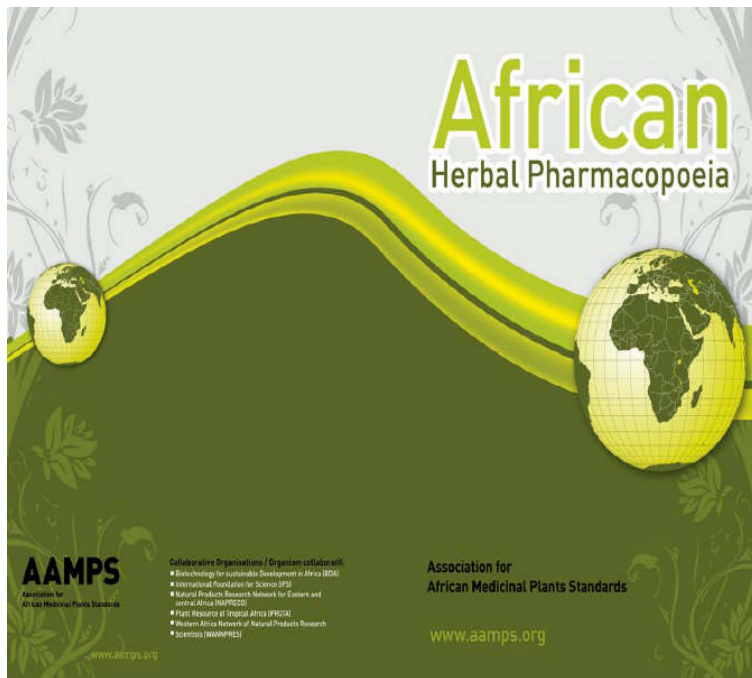
The African Ethnobotany Network was founded at the 15th AETFAT Congress held in 1997 in Harare.

More than **4,600 bibliographic references**.

The area under study comprises **27 countries**

Networks on Traditional knowledge and related subjects in Africa

AAMPS (African Association of Medicinal Plants Standard)



Most up-to-date and extensive publication on the uses, quality, safety and efficacy of **52** of most important African medicinal plants.

www.aamps.org

Networks on Traditional knowledge and related subjects in Africa

Networks on Natural Products with significant presence in Africa

NAPRECA (Natural Products Research Network for Eastern and Central Africa)

<http://www.napreca.ne>

WANPRES (West African Network of Natural Products Research Scientists)

www.wannpres.org

The aims and objectives of NAPRECA and WANPRES are :

- ★ To initiate, develop and promote research in the area of Natural Products in Africa;
- ★ To encourage collaboration in all areas of natural product research in Africa;
- ★ To exchange information among scientists working on different aspects of natural product research.

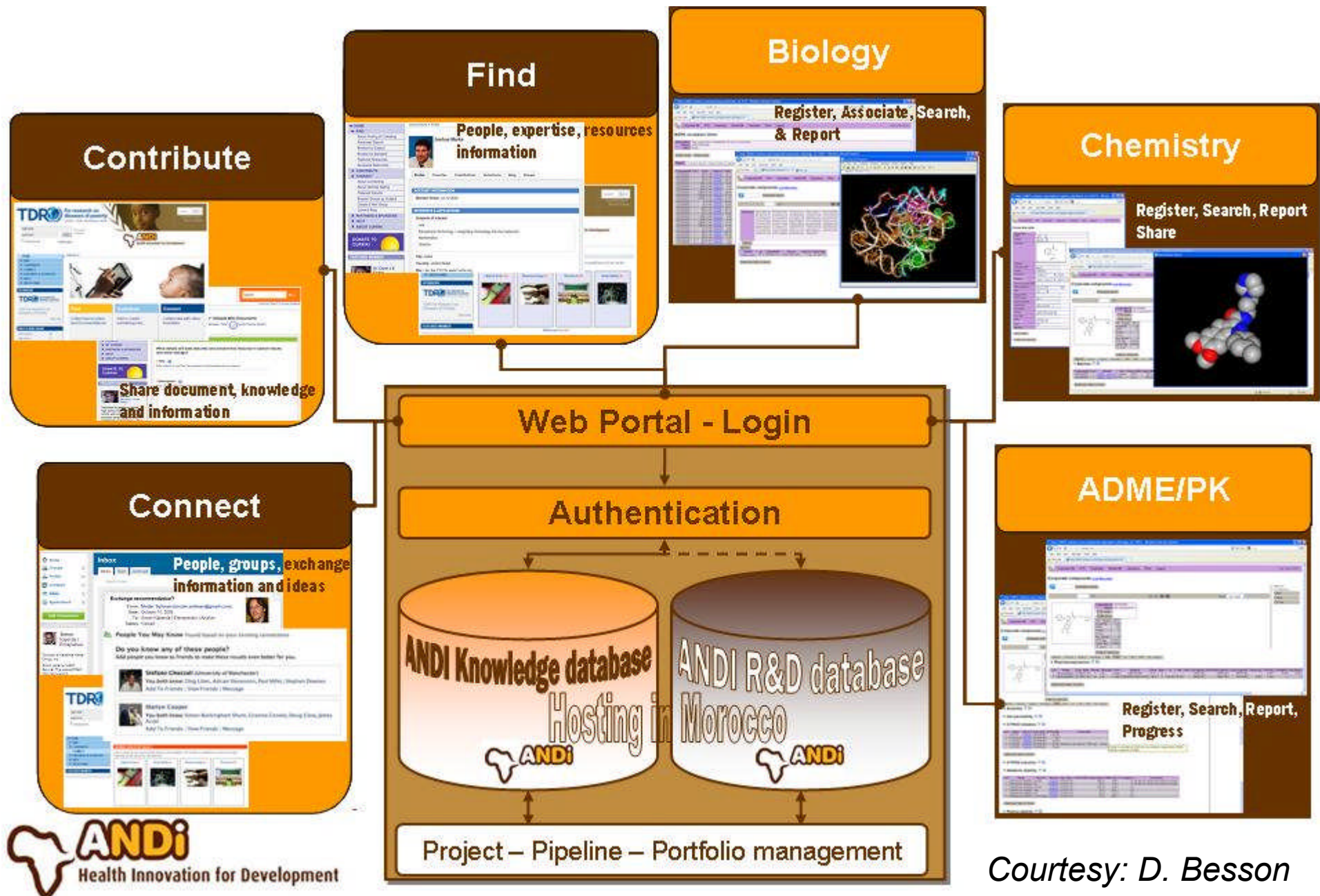
Networks on Traditional knowledge and related subjects in Africa

ANDI (**A**frican **N**etwork for **D**rug and Diagnostic **I**nnovation)

Mission Statement:

*"To promote and sustain African-led Health Product Innovation to address African public health needs through efficient use of **local knowledge**, assembly of research **networks**, and building of capacity to support **economic development**"*

ANDI R&D and Knowledge Management Databases



Courtesy: D. Besson

Critical analysis

- ➔ Vast amount of plant biodiversity;
(Sub-Saharan Africa and the Indian Ocean Islands contain approximately **60.000** plant species – roughly a quarter of the world's total)
- ➔ Vast amount of documented ethnomedical knowledge through databases;
- ➔ Existence of infrastructures and expertise for:
 - basic research (botany, chemistry, pharmacology);
 - clinical trials;
 - drug manufacturing.

Critical analysis (cont'd)

- ➔ To date, Africa has only contributed **83** of the world's **1100** leading commercial medicinal plants.
- ➔ Externally-driven projects on databases.
- ➔ Lack of culture of business, mainly in Sub-Saharan Africa.

Which way forward?

Building a digital library of African Traditional Knowledge

- **Tool for defensive protection:**
 - misappropriation of disclosed African traditional knowledge;
 - Bridge between Traditional Knowledge as **prior art** and patent examiners.
- **Users obligations** to avoid bio-piracy.
- **Tool for active research**

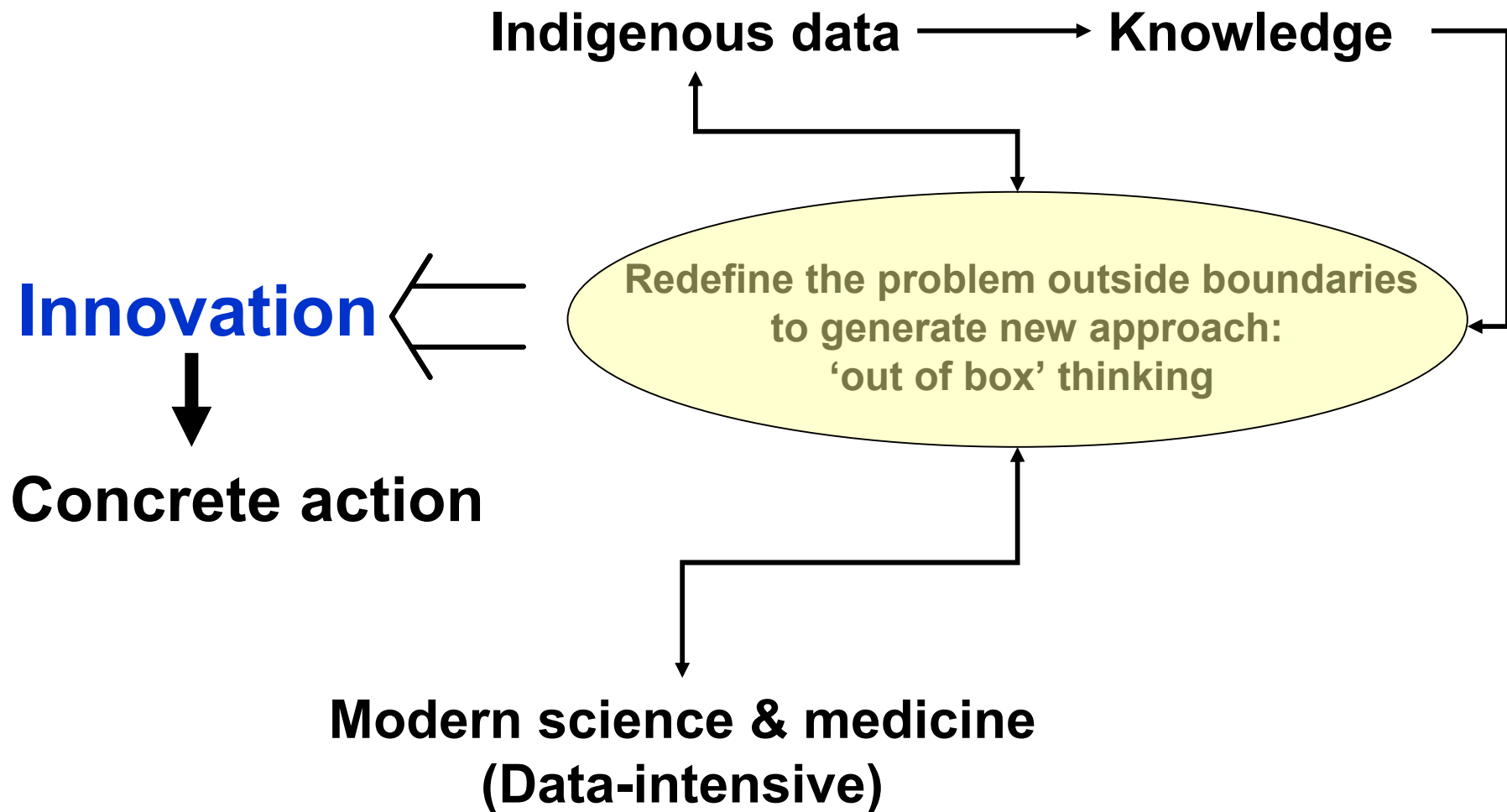
Which way forward?_(cont'd)

CESRIKI, IMRA and TWAS jointly submitted a project to JRS Biodiversity Foundation for Database on African medicinal plants.



“To enhance knowledge and promote the understanding of biological diversity for the benefit and sustainability of life on earth.”

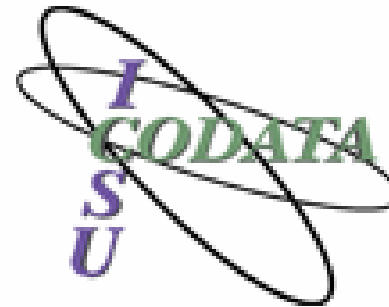
Which way forward? (cont'd)



Acknowledgments



and



HINARI/OARE/AGORA projects, through WHO,
for free access to on-line databases.