






Current state of food security: Research, Education and Outreach in Burkina Universities

- ▶  Short presentation of Burkina Faso
- ▶  Polytechnical University of Bobo-Dioulasso
- ▶  University of Ouagadougou
- ▶  Research activities
- ▶  Challenges

By

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I. Introduction

- Burkina Faso is a Sahelian West African country
- Climate: tropical dry and hot
- Long dry season (8 months) and high mean temperatures (maximum 45 degrees C).
- Population is 16 million and 43.9 % lives below the poverty line
- Burkina Faso is classified as both a least developed country and a low-income, food-deficit country.



II. GENERAL INFORMATION ON BURKINA FASO

Economie

- The economy of BF is largely dependent on the primary sector, which contributes to a third of GDP and generates 80 % of export revenue.
- Livestock contributes to 20 % of export revenue and is fundamental to household food security, but this sector receives low investments.

Food and nutrition

- Food insecurity affects 50 % of households, and is increasing in the urban areas.
- The nutritional status of children under 5 is a concern: prevalence of global acute malnutrition is above 10 % and stunting nearly 30 %.
- Prevalence of obese people : 7,3 %
- The nutritional quality is poor in Faso (2140 against 3000 Kcal/person/day)
- Burkina

In the North region of Burkina Faso

- **Acute malnutrition levels are above the "serious" 10% threshold.**
- **WFP has launched an emergency operation to reach 1.1 million people in Burkina Faso with food assistance and nutrition support (WFP repport on Burkina Faso, 2012).**

Situation of importations

Food imported food concerns mainly some cereals and animal products.

- **Cereals (mainly rice and wheat) about 200 000 tonne per year**
- **Milk and egg about 10 000 tonnes per year**

III. GOAL OF THE FOOD AND NUTRITION POLICY

Increase agricultural production to be self/sufficient

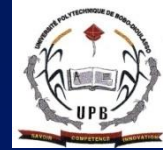
BF is one of the country that respect the 2003 Maputo's declaration's call to invest at least 10 percent of the budget in agriculture,

in order to increase agricultural production and attain food self-sufficiency

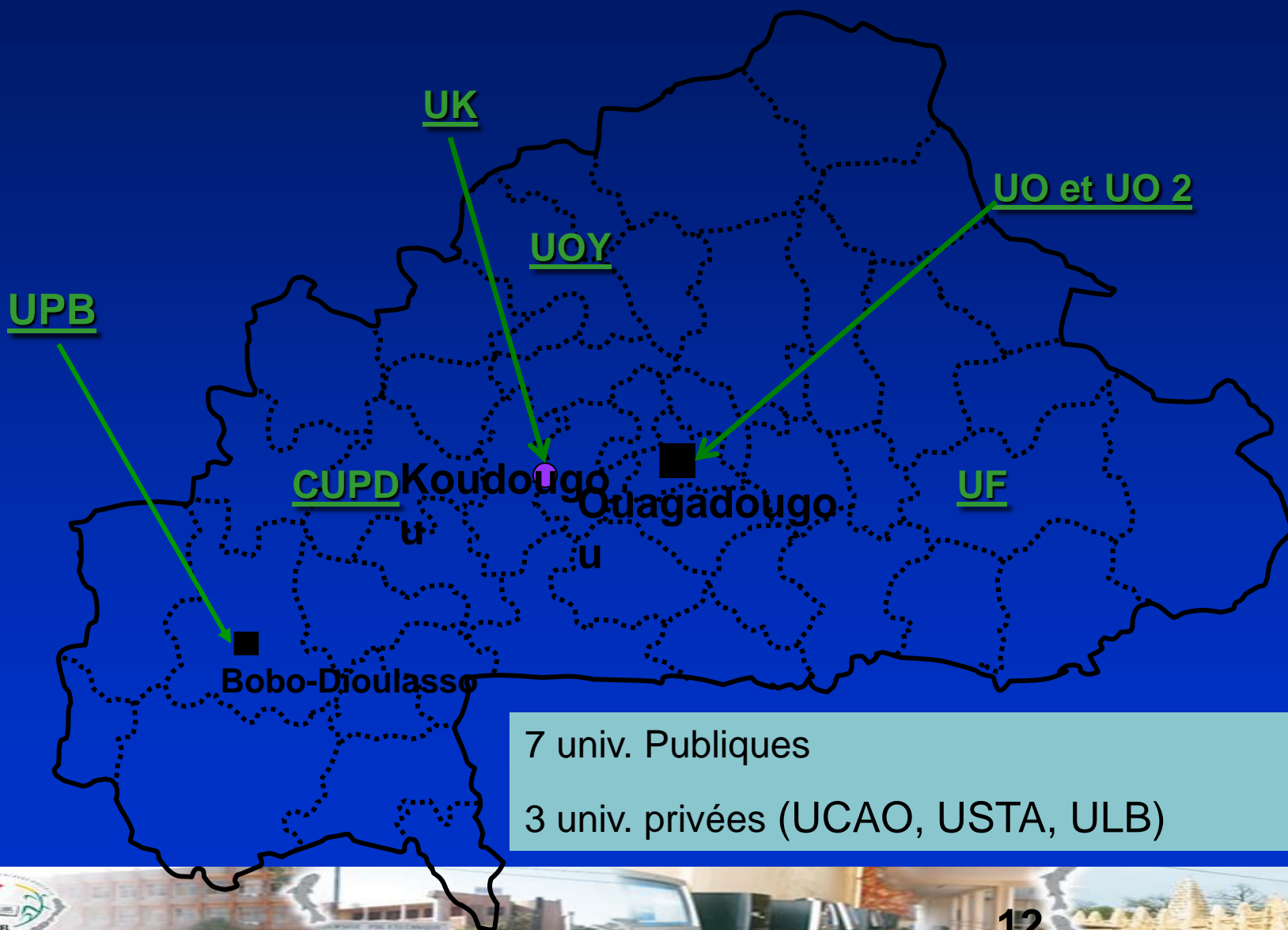
Strategic plan

- A 10/year programme of building small dams to support irrigation was introduced
- Production of improved seed has been reinforced and a national seed center was created to produce improved seed.
- Government is also supplying producers with free seed (cost:13 million USD per year) as well as heavily subsidised fertiliser, tractors and pumps (cost: 30 million USD per year) for irrigation.

IV. THE POLYTECHNIC UNIVERSITY OF BOBO DIOULASSO AND ACTIVITIES ON FOOD SECURITY IN THE COUNTRY



Universities in Burkina





The polytechnic university of Bobo Dioulasso

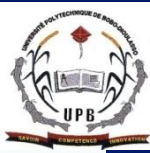
- Created en 1995 by the transfert in Bobo Dioulasso of 2 institutes et 1 school of UO
- Localisation : 15 km from the city (1000 ha). Laboratories and one institute are localised in town

- 5 Institutes , 1 school
- total number of student : 3 000





Institutes and school of the PUB



1. **Institute of rural development**
2. **School of computer science**
3. **Institute of technologies**
4. **Institute of exact and applied sciences**
5. **Institut e of natural and life sciences**
6. **Institute of health sciences**





The institute of rural development

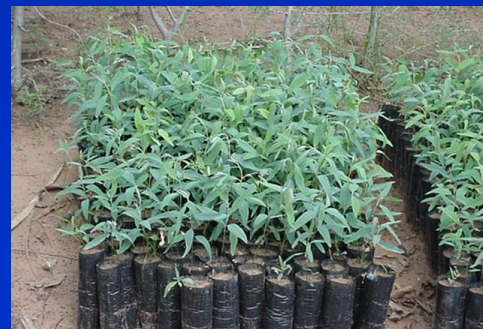


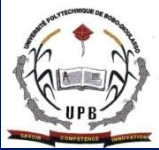


6 départements



- ✓ Agronomy
- ✓ Animal husbandry
- ✓ Water and forest sciences
- ✓ Sociology and rural economy
- ✓ Agricultural extension service
- ✓ PhD training





Education and research in the institute of rural development

- ✓ 23 permanent lecturers (assistant/ professor to full professor)
- ✓ Temporary lecturers (technical ministry) and foreign lecturers
- ✓ 3 research stations for training the students and also for the research (Gampéla, Léo, Bama)
- ✓ 8 laboratories



VI. VISION OF THE PUB ON FOOD SECURITY TROUGHT EDUCATION /TRAINING & RESEARCH

Education and training on food production

- Animal production (ruminant, pigs poultry)
- Crops production
- Aquaculture and forest production

Maize, cowpea, poultry meat and eggs are produced in the station and are sold in the country

Education and training on food processing

- Post/harvest technologies
- Technologies of meat and fish
- Technology of milk and milk products
- Technologies of fruits and vegetables
- SAFE (Sassakawa Africa Fund for Extension Education) is promoting the introduction of Value Chain Approach in the curricula of the department of agricultural extension education

Research on food security in the institute of rural development

Research on food security concerns

- Improvement of animal health and production in the rural areas to increase production and intake of animal food protein by the population (meat and eggs)
- Evaluation of locally available by/products in animal nutrition to reduce cereal intake by animal
- Research on new varieties of cereal seed suitable for arid environment
- Research on soil fertility for a sustainable agriculture production

Conclusion

- Burkina Faso need an organisation to improve the management of small-holders' harvest, in order to reach self sufficiency.
- Education in the universities need to be more practical and practical training materials are needed

- **Practical topic such as value chain approach need to be added in the curricula**
- **Technical ministries and international donors must support the universities**

University of Ouagadougou (I+II)

www.univ-ouaga.bf

Public University

 Physics_Chem, Maths: 3500 students

 Life and Earth Sciences: 5800 students

 Medicine and Pharmacy

 Art and Communication

 Human and social sciences

 Economy and accounting

 Law and political sciences

Faculties (7)

(53 000 students,
72% of students
from Burkina
Faso)

 Lecturer staff: 450 prs

 Administration: 500 prs



Faculty of life and earth sciences

After 2 years of
Biological chemistry

DEPARTEMENT OF BIOCHEMISTRY AND MICROBIOLOGY

After 2 years

Bsc Natural
substances

Bsc Biochemistry
and Microbiology

Bsc Food Technology
and Human Nutrition

Msc
PhD

Msc, PhD,
BIOTECHNOLOGY

Msc, PhD
Agrotech and
Food Science

Msc, PhD
Human Nutrition



Curricula of Food Technology and Human Nutrition

FONDAMENTAL (45 credits)

- Structural Biochemistry
- Enzymology and Metabolism
- Immuno-chemistry
- Bioenergetic
- Analytical sciences
- Computer Science

APPLIED (75 credits)

- Epidemiology
- Physiology of nutrition
- Food composition Tables
- Food technology 1
- Food microbiology and hygiene
- Enzymes and nutrition
- Physico-chemistry of food



Curricula of Food Techno and Nutrition, cont.....

FONDAMENTAL (300 hrs)

- Molecular Biology
- Biophysics
- Structure of Macromolecules
- Molecular Enzymology
- Computer Science (ITC)

APPLIED (500 hrs)

- Community nutrition
- Research technics and methods in nutrition
- Nutrition assessment
- Food technology
- Food microbiology and hygiene
- Quality assessment
- Accounting and management



Curricula of Master in Agrotechnology and Biochemical Engineering of Food Process

FONDAMENTAL (45 credits)

- Applied physical-chemistry
- Analytical Methods
- Molecular Biology (GMO)
- Immunology
- Food Physics
- Biochemistry of Macromolecules
- Food Biochemistry

APPLIED (75 credits)

- ITC and Biostatistics
- Enterprise
- Monitoring agricultural and industrial waste products
- Food Toxicology
- Quality managing
- Biosecurity
- Physico-chemistry of food



Curricula of Master in Agrotechnology and Biochemical Engineering of Food Process cont.....

FONDAMENTAL (350 hrs)

- Food Technology
- Biophysics
- Structure of Macromolecules
- Molecular Enzymology
- Computer Science (ITC)
- Bioinformatics (gene banks, phylogeny, simulatons, etc.)

APPLIED (550 hrs)

- Applied Microbiology
- Research technics and methods in Agrotech
- Research Proposal and Literature search
- Food microbiology and hygiene
- Accounting and management



Job opportunities

- **Further Msc and PhD enrollment:** average only 5 nationals and 5 foreigners p/y
- Lecturer of Food Technology and Human nutrition at secondary school (started 2003)
- Food industries (beverage, bakeries, milk industries)
- NGOs related to Nutrition & Food science (FAO, UNICEF, GTZ, IRD, etc..)
- Small scale food enterprises
- Public function at ministry of AGRICULTURE or Animal breeding
- Creation of private food enterprises



General origin of foreign students

- Benin
- Cameroon
- Centrafrica
- Congo
- Côte d'Ivoire
- Guinée
- Djibouti
- Gabon
- Niger
- Mali
- RDC (Zaire)
- Tchad
- Togo



Research facilities Laboratories at University and Research centres



CTA workshop, Ede-Wageningen, 2012

RESEARCH ACTIVITIES

- Food consumption of children 6 – 36 months old in rural area in relation to micronutrients rich food availability
- Vitamine A supplementation and weaning food energy intake of infant between 6 and 10 months
- Dietary intake and anaemia prevalence in women of childbearing (17-40 yrs) age
- Novel sources of lipids from wild grains of Burkina
- Biochemical and hygienic qualities assessement of street foods in Burkina Faso



RESEARCH PROJECTS cont.....

- *Nutritional quality evaluation of sorghum and millet varieties: application in weaning food preparation
- *Nutraceuticals (Antioxidant activities) of staple food and medicinal plants of Burkina Faso
- Molecular epidemiology of Aflatoxin and fumonisin contamination of maize in Burkina Faso
- * Tables of Food Composition,



Research and training collaborations in Food, Agrotech and Human Nutrition

Main collaborators for training and research

- Wageningen University
- Institut National de Recherche pour le Développement IRD, France
- University of Marseille (3 Prof.)
- Benin, Côte d'Ivoire, Togo

Others for training

Africa: Benin, Niger, Côte d'Ivoire, Togo and Senegal

Europe/USA: Cornell University (USA), Wallone Center of Industrial Biotech (Belgium); Leeds University (England)



International meetings for nutrition and Food Science

22-24 Novembre 1999: Small scale food industries for a healthy Nutrition in West Africa. International Foundation for Science (Sweden, Stockholm). Wageningen University, Institut de Recherche pour le Développement

23-28 Novembre 2003 : Food-based approaches for a healthy nutrition in West Africa: the role of food technologists and nutritionists. Wageningen University, Institut de Recherche pour le Développement, FAO.



Regional distinction and Awards

- 1998. UNESCO chair of Biotechnology
- 2000. Association of African University (AAU) regional center for Biotechnology
- 2004. African Centre of Excellence For Biological, food and Nutritional Sciences by Association Universitaire pour la Francophonie (AUF) .
- 2006. UEMOA Centre of Excellence in Biotechnology
- 2011. Partner of International Master degree training in distance in Biotechnology (with UCAD)
- 2012. UEMOA Centre of Excellence in Biotechnology and Molecular Biology



Menu

CHALLENGES for Food Science and nutrition

A. EDUCATION

- Maintain the Centre of Excellence because it is annually audited to check if we meet the standard to be founded
- Increase the number of students with a goal of 50 p/y
- Improve the number of student in TANH because of a permanent demand and need. Social need in the country as well as neiggboring ones but incapacity of training a huge number of students
- Increase the number of labs, equipement and chemicals for praticals. Ex. Insuffisant recycling of chemicals. Research labs are robed by pratical labs for students training



CHALLENGES for Food Science and nutrition

A. EDUCATION

- ITC: increase number of computers and incorporate ITC in training. At the time being: no portals, no blackboard and no distance training in Nutrition and Food Sciences. Only ppts and small Internet access are available
- Tutorial books are expensive. Free books and lectures from other universities are available in the Internet but printing is expensive. The education is almost free (less than 150 UDS/year at public universities) but students are mostly from low income families.



CHALLENGES cont.....

B. Staff

- Increase the number of permanent staff, because enough PhD in Agrotech, food techno and nutrition but no permanent positions. 4 PhD in Nutrition and Food Science are currently available without positions
- Recruit more tutors for practicalities because they are currently carried out by graduate students
- Lack of updating of staff with respect to ITC and research
- Low salary of staff, so no stimulation from the government. Without projects, no academic life. Plan for academic promotion is clear but difficulties to carry out research because of students supervision and lectures



CHALLENGES cont.....

C. Research

- Necessity to include incubators at University
- Lack of the maintenance of equipments
- Lack of qualified research assistants
- Problem of application of the research, e.g. Food Science, Agrotec, and Nutrition interventions are difficult
- Food research counters ethic problem, sociologic approach and reticence of population
- The low literacy of rural area population makes survey and interventation studies difficult
- Need of long term projects instead of short term project
- Need pragmatic projects instead of theoretical ones
- Encourage Incubation projects.



MERCI BEAUCOUP

"FOFO"