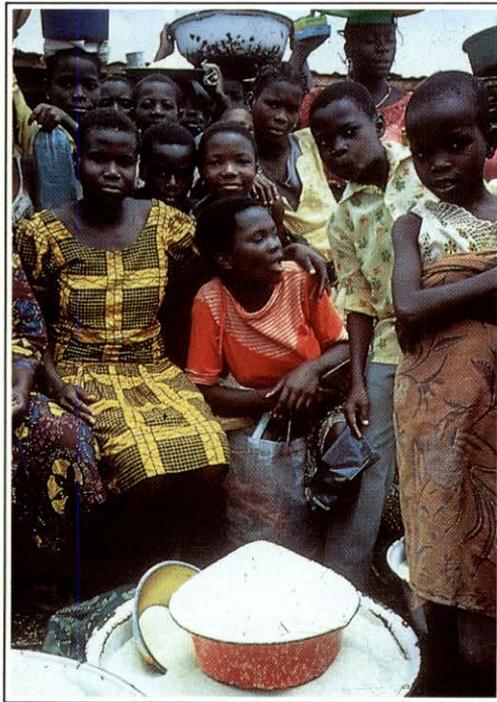
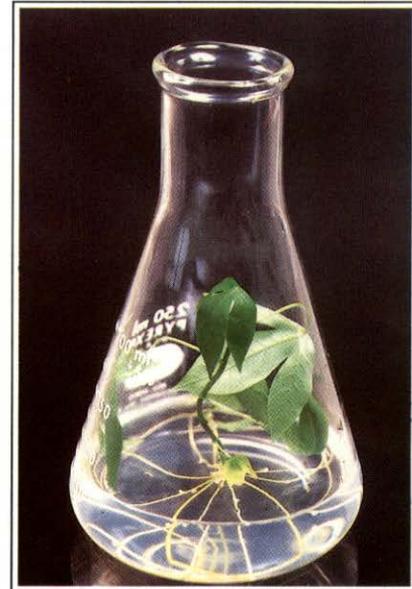


# THE CASSAVA BIOTECHNOLOGY NETWORK

**CIAT**  
16 SET. 2002  
UNIDAD DE INFORMACION Y  
DOCUMENTACION



**CBN**  
A forum for  
cassava  
biotechnology



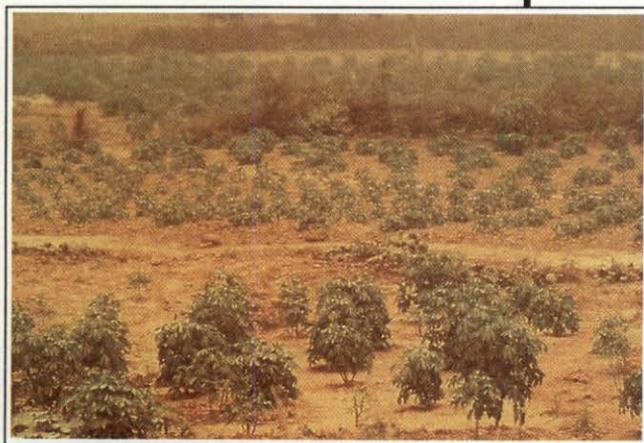
**CASSAVA**  
A mother crop for  
millions

**CBN's goal**  
To mobilize  
biotechnology as an  
instrument to alleviate  
poverty and assist  
development in tropical  
countries



# CBN: The Cassava Biotechnology Network

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## **Cassava, a Mother Crop for Millions**

Cassava (*Manihot esculenta*) is a staple for as many as 500 million people. Its starchy roots produce more calories per unit of land than any other crop, except sugarcane. Cassava leaves provide vitamins and protein when eaten as a vegetable, a common practice in Africa. Cassava has two roles: it is a reliable crop for food security, and it provides a raw material for economic development. Because it tolerates drought and low fertility, cassava is primarily grown by small-scale farmers in areas with poor soils or unfavorable climates. It can be processed into different forms for a wide variety of end uses, and much of this processing can be carried out locally, providing jobs and income in rural areas. In many cultures, cassava production, processing, and marketing are women's activities.

## **Why the Cassava Biotechnology Network was Founded**

Until recently, there was little international awareness of the importance of cassava to millions of

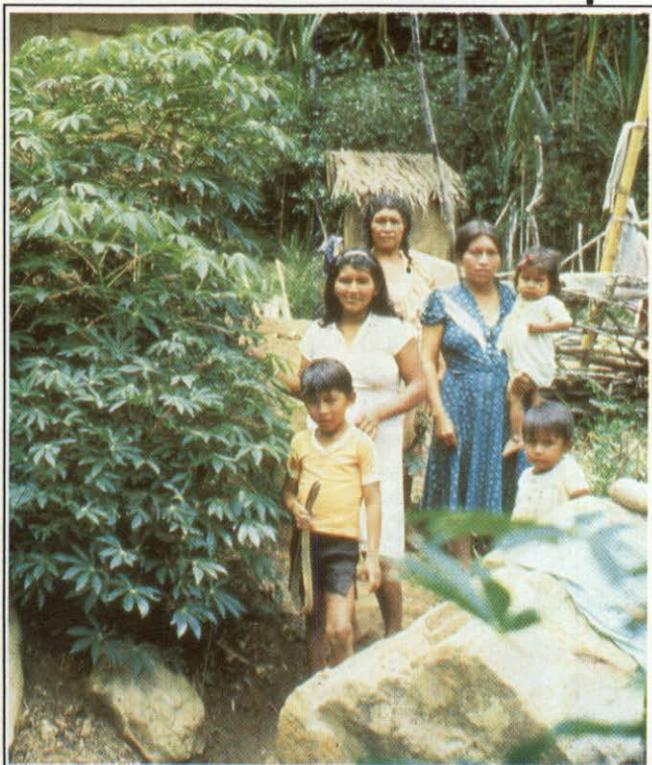
the world's poorest people. Powerful biotechnological tools for agricultural research were developing rapidly, but little was being done to apply these new tools to cassava. The Cassava Biotechnology Network (CBN) was formed in response to the need for a forum on cassava biotechnology issues and to foster use of biotechnology where it can help to address priority areas of cassava research. CBN draws together the experience and efforts of many different organizations and countries; encourages them to collaborate in research and to share techniques, results, genetic materials, and training efforts; and, through broad-ranging dialogue, defines and continually reexamines priorities for research.

To implement its objectives, CBN seeks to provide a communications link between entities such as associations of small-scale cassava farmers and processors; nongovernmental organizations; national agricultural research and development systems in developing countries; other networks that focus on cassava, development, or biotechnology; advanced research laboratories around the world; international agricultural research centers; and agencies that fund international development.



# Objectives of the Cassava Biotechnology Network

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## **1. Integrate priorities of small scale farmers, processors and consumers in cassava biotechnology research planning**

Involve organizations of small scale farmers and processors in setting objectives and priorities for cassava research. Identify those areas of high priority for which a biotechnological approach would offer a comparative advantage in solving problems and opening new opportunities for farmers and national economies.

## **2. Stimulate cassava biotechnology research on topics of established priority**

Coordinate the experience and efforts of a spectrum of organizations in the scientific and donor communities of industrialized and developing countries to address high priority research in cassava biotechnology.

## **3. Foster free exchange of information on cassava biotechnology research, including techniques, results, and materials**

Organize biennial scientific meetings, other meetings, and workshops. Publish scientific proceedings, a semiannual newsletter, and other material.

# How the CBN is Organized

CBN is structured as a research consultation network for cassava biotechnology. Within the CBN, informal working groups have formed around priority cassava biotechnology research themes, according to the technical demands of each theme and the comparative advantages of various groups. CBN supports these working groups through facilitating contact and encouraging meetings to clarify progress and coordinate planning.

CBN is advised by a Steering Committee and a Scientific Advisory Committee. Their members represent national programs of cassava-growing regions, international centers, donors, and biological and socioeconomic sciences. The CBN Coordinator organizes (1) formulation of cassava biotechnology research priorities and integration of perspectives of cassava end-users; (2) exchange of information within the Network; (3) Network publicity; (4) working group facilitation and meetings.

The Coordinator also represents CBN to the research and donor communities. A small core budget provides seed money and training funds to enable high priority projects to start. The further funding of a project comes from individual donors or institutions. *CBN is not a donor agency.*

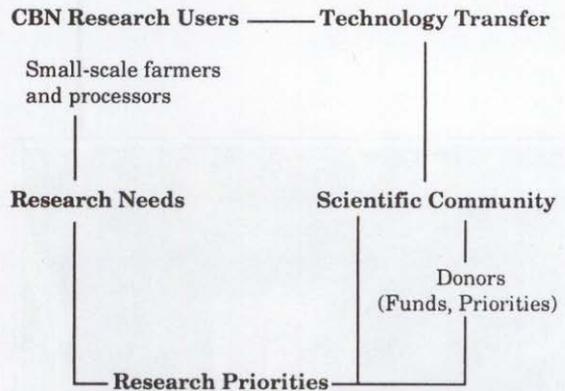
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## STRATEGIES

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## CBN

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# Cassava Biotechnology Research Priorities

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Priority level H, high;  
M, medium; (low priority  
research areas are omitted)

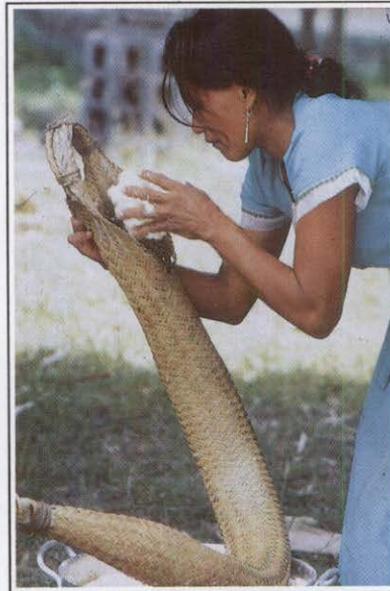
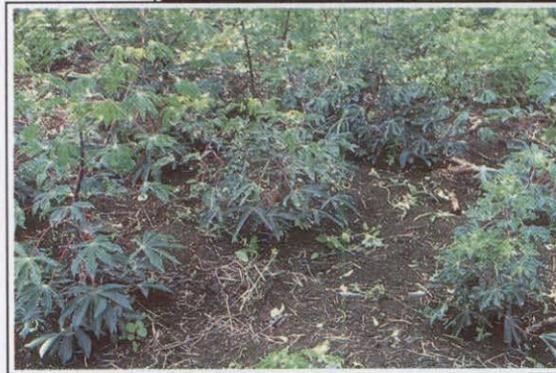
## ***Biotechnology applications: For realizing cassava opportunities***

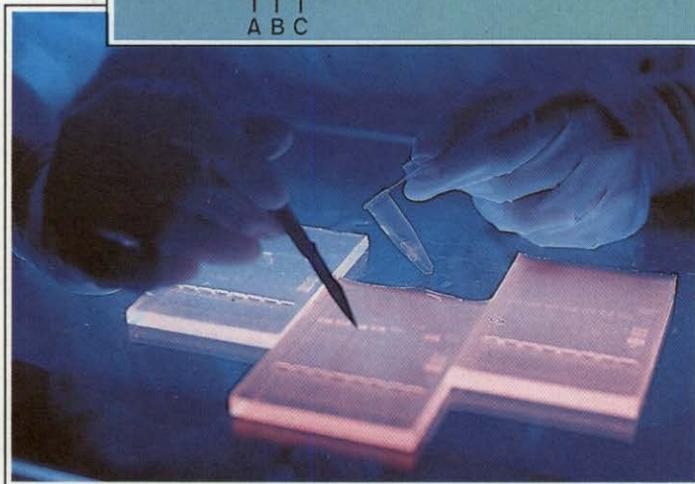
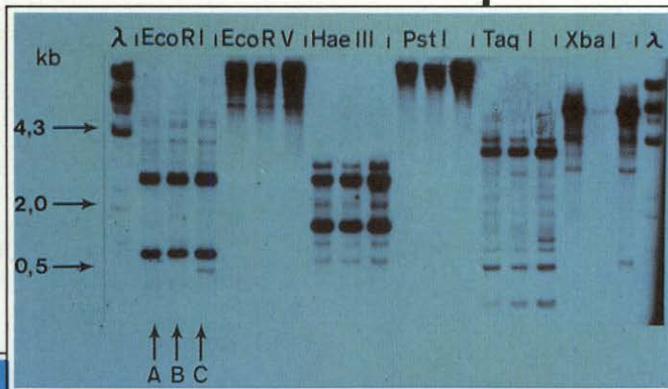
- H Starch quantity and quality for diverse end uses
- M Fermentation, biochemistry, and molecular genetics for:  
(1) new product development and (2) desired texture, taste, and nutritional value
- M Plant nutrient cycling efficiency
- M Extended range and increased productivity in suboptimal agroecological zones through research on photosynthesis under stress and enhanced mycorrhizal interactions, biofertilizers

## ***Biotechnology applications: For solving cassava problems***

- H Integrated pest management, including host/pathogen and host/pest interactions

- 
- H Resistance to important viral diseases
  - H Modified cyanogen biochemistry for optimal cassava production and use
  - M Enhanced fermentation systems for: (1) cyanogen reduction and (2) waste management
  - M Delayed postharvest deterioration
  - M Development of true seed for cassava production





***Biotechnological tools: For genetically improving cassava***

- H Molecular and cytological characterization of *Manihot* species genomes
- H Molecular genetic map and international database of genomic data
- H Useful genes and gene promoters, characterized and cloned
- H Improvement of plant regeneration systems
- H Improvement of genetic transformation techniques
- M Techniques for regulation of reproductive biology (flowering, pollen conservation, haploid production, apomixis)

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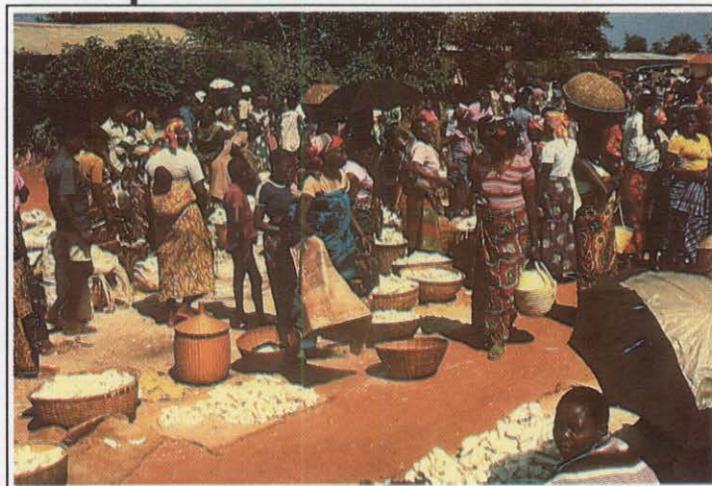
***Biotechnological tools: For conserving and exchanging Manihot genetic diversity***

- H Diagnostic methods for clear germplasm transfer
- M Cryopreservation for long-term conservation of genetic resources
- M Tissue culture for germplasm conservation and micropropagation



***Setting priorities for cassava biotechnology research***

CBN places *high priority* on ***socioeconomic studies***, which provide knowledge of the perspectives of small-scale cassava farmers and processors and of cassava problems and opportunities, and on ***interdisciplinary studies*** to understand complex issues such as cyanogenesis, rapid postharvest deterioration of cassava, and the use of true seed as a means for commercial propagation.



# Cassava Biotechnology Research Projects 1993

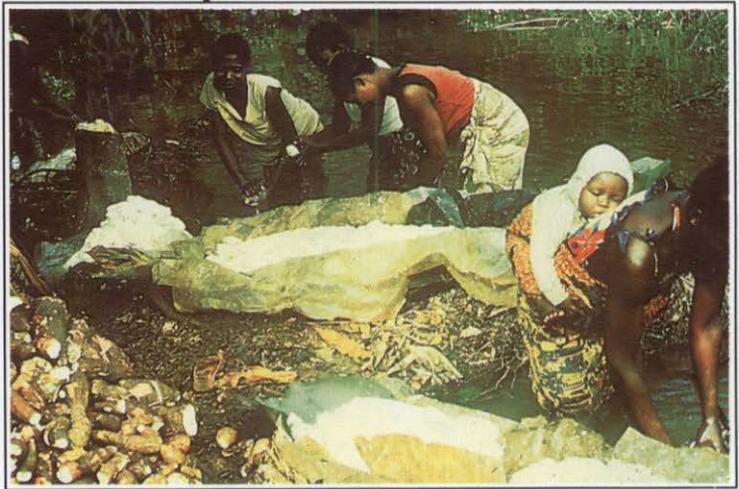
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Research Area	No. of Projects	Countries & IARCs
Tissue culture, micropropagation	Many	Barbados, Cameroon, Cuba, China, Indonesia, Nigeria, Panama, Peru, Samoa, Venezuela, Zaire, and others; CIAT, IITA
Regeneration	9	China, France, Netherlands, UK, USA, Zimbabwe; CIAT, IITA
Transformation	7	Canada, Brazil, UK, USA; CIAT, IITA
Molecular mapping, markers, fingerprinting	6	France, UK, USA; CIAT, IITA
Virus resistance	3	Netherlands, USA, Zimbabwe
Cyanogenesis	7	Denmark, Netherlands, Thailand, USA; CIAT, IITA
Photosynthesis	2	Australia, USA
Cryopreservation	2	France; CIAT
Processing	Many	Argentina, Brazil, CIAT, Colombia, Congo, France, Ghana, India, Nigeria, South Africa, Tanzania, UK, and others

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## Support for CBN

CBN coordination is supported by:  
*The Special Programme for Biotechnology  
and Development Cooperation,  
Directorate General for International  
Cooperation (DGIS), The Netherlands*



## How to contact CBN

The CBN can be contacted through the Coordinator or any Steering Committee member.

The Coordinator, CBN  
c/o CIAT  
A. A. 6713

Cali, Colombia

Fax: (57-23)-647243  
E-mail: CGI456 or CGI098  
Telex: 05769 CIATCOL  
Telephone: (57-23)-675050

African correspondents can also contact CBN through IITA:

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c/o Program Leader, TRIP, IITA  
PMB 5320  
Oyo Road, Ibadan, Nigeria  
Fax: (234-1) 611896  
E-mail: CGI072  
Telex: 31417 TROPB NG  
Telephone: (234-22) 400300-317  
874-177-2-276

# **CBN Steering Committee**

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## **LATIN AMERICA**

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e Fruticultura Tropical, Brazil

## **CIAT**

William M. Roca  
Biotechnology Research Unit

## **IITA**

Robert Asiedu  
Root and Tuber Improvement Program

## **DGIS**

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and Development Cooperation, The Netherlands

## **BIOCHEMISTRY-PROCESSING**

Rodney D. Cooke  
Natural Resources Institute, United Kingdom

## **BIOLOGY**

Claude M. Fauquet  
ORSTOM, France and ILTAB/TSRI, USA

## **SOCIOECONOMICS**

John K. Lynam  
Rockefeller Foundation, Kenia

## **CBN COORDINATOR**

(Member ex-officio)  
Ann Marie Thro



**Photographs:**

p. 3, lower photo:

R. D. Cooke  
Natural Resources, Institute, U. K.

P.5, lower photo:

C. M. Fauquet  
ORSTOM, France and ILTAB/TSRI, USA

p.10: M. Bokanga, IITA

Other photos: CIAT



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