

Status and Prospects of the Green Revolution



IAMA 20th Annual World Forum: Navigating the Global Food System in a New Era

**Session -- Sustainability and Productivity: Are
they Compatible?**

Status and Prospects of the Green Revolution

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Acknowledgements

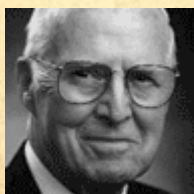
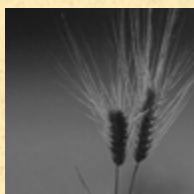
- CAST Issue paper, No. 45, 1/2010
Norman Borlaug, Gale Buchanan,
Robert Herdt and Luther Tweeten
- Father of the Green Revolution
Norman Borlaug
- Task Force for Business and Stability
Operations

Norman E. Borlaug

Nobel Peace Prize 1970

“THE FIRST ESSENTIAL
COMPONENT OF
SOCIAL JUSTICE IS
ADEQUATE FOOD
FOR ALL MANKIND.”

- NORMAN E. BORLAUG



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Today the Borlaug Institute seeks to follow in Dr. Borlaug's footsteps with:

- Bold ideas
- Quick action
- Persistent effort
- Science-based solutions



World Food Insecurity

Underlying conditions causing the world food crisis:

- **Technology fell behind**
- **Land taken out of production**
- **Incomes rising**
- **Population rising**
- **Energy costs trending upward**



World Food Insecurity

Sparks that ignited the world food crisis:

- Accelerated biofuel production
- Bad weather
- Conflict in food growing regions
- Food stocks falling
- Speculative demand



World Food Insecurity

Events reduced the pressure on food prices:

- **Good weather**
- **Expanded production area**
- **Increased fertilizer and other inputs**
- **Reduced incomes**

Underlying conditions remain:

- **Population**
- **Land/water going to other uses**
- **Long-term rising incomes**
- **Technology slow to respond**

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At a cost:

World Hunger however has increased from 854 million persons in 2006 to 1.02 in 2009 (FAO Database)

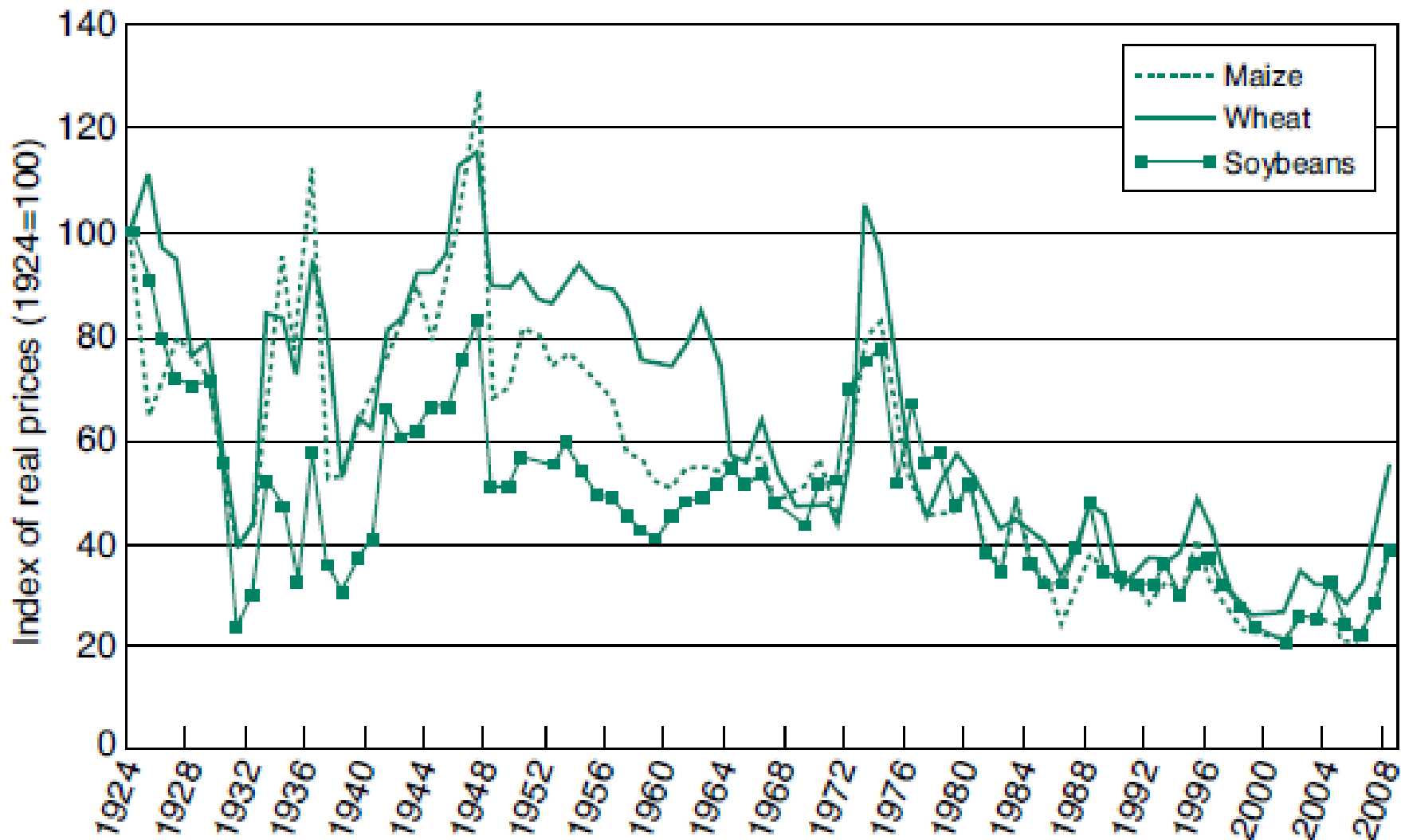


Figure 1. Real U.S. prices of malze, soybeans, and wheat, 1924–2008 (Alston, Beddow, and Pardey 2008).

**Table 2. Growth in agricultural land and labor productivity worldwide, 1961–2005
(Alston, Beddow, and Pardey 2008)**

Group	Land Productivity		Labor Productivity	
	1961–1989	1990–2005	1961–1989	1990–2005
Developing countries	2.60	3.00	1.60	2.56
Excluding China	2.47	2.29	1.49	1.49
Developed countries	1.71	0.27	3.81	2.89
World	2.04	1.84	1.12	1.37
Excluding China	1.93	1.20	1.23	0.42
Excluding China and USSR	1.93	1.58	1.14	0.73
Top 20 producers	2.08	2.18	1.14	1.78
Excluding China	1.98	1.38	1.32	0.63
Other producers	1.83	0.88	1.08	0.07

CAST/Borlaug Recommends for US:

- Take greater advantage of global markets
- Achieve efficiency through research on sustainable agricultural productivity for food, energy, feed, fiber environmental quality
- Seek public support for political action on climate, animal welfare, natural resources, and long term investments in research and education

CAST/Borlaug -- Continued

In view of interrelations of the US economy to global agriculture, especially China, India, Brazil and Sub-Saharan Africa --

Commit to scientific approaches to improve agricultural productivity

CAST: Next Green Revolution

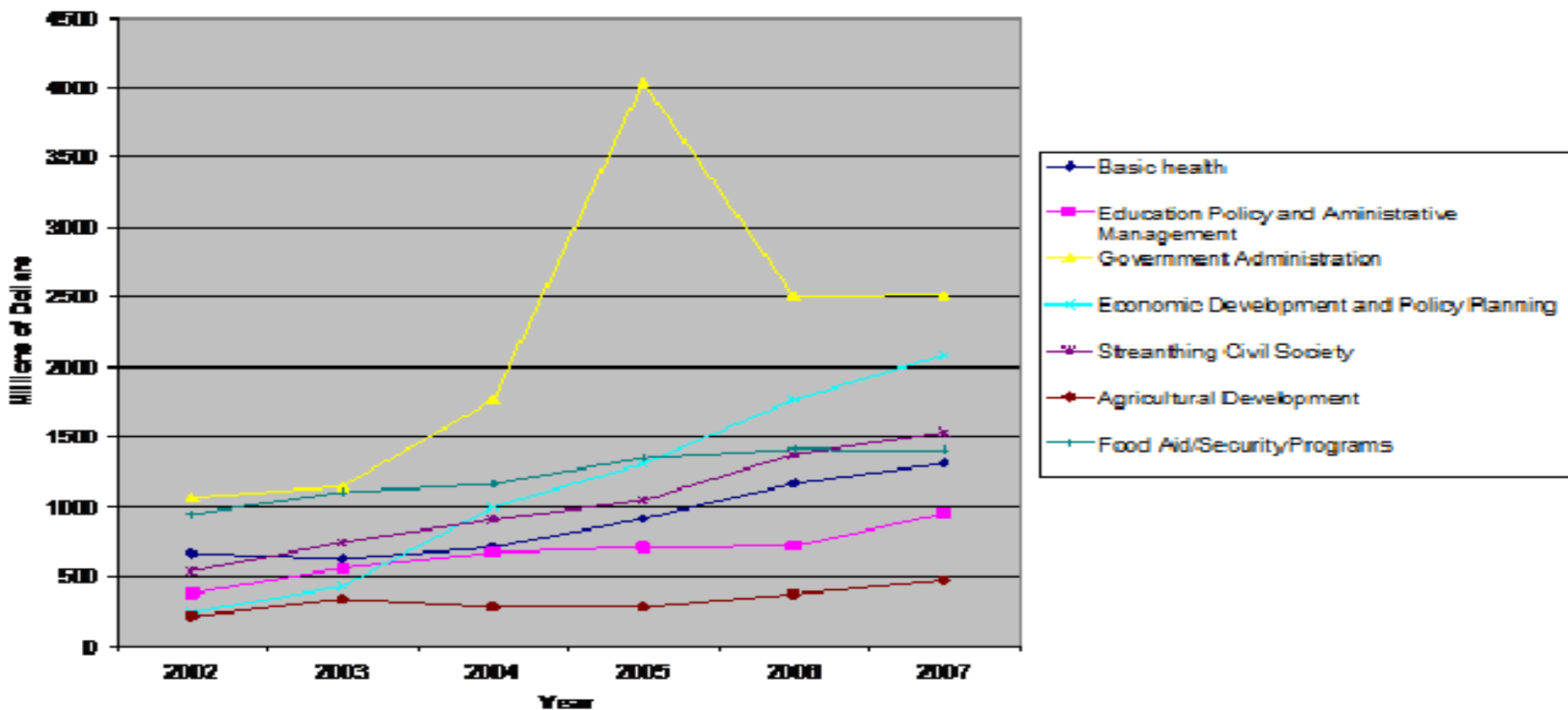
- C₃ plants to C₄ photosynthetic pathway
- N fixation for nonlegumes
- Apomixis for plants
- Better water and nutrient efficiency in crops
- More efficient process for fuel from cellulose
- Improved pest resistance in plants
- Increased energy efficiency in plants
- Commodities with greater health benefits

Developing country perspective on donor country initiatives

- Sustainability – community rights to resources:
Land, water, genetics
- Chemical fertilizer – remains a potent short & long-term way to improve productivity
- Public-Private partnerships – market ready products vs market access; cultural practices vs genetics, disease response, advanced fertilization.
- Bioengineered crops – political litmus test in LDCs, BT Brinjals

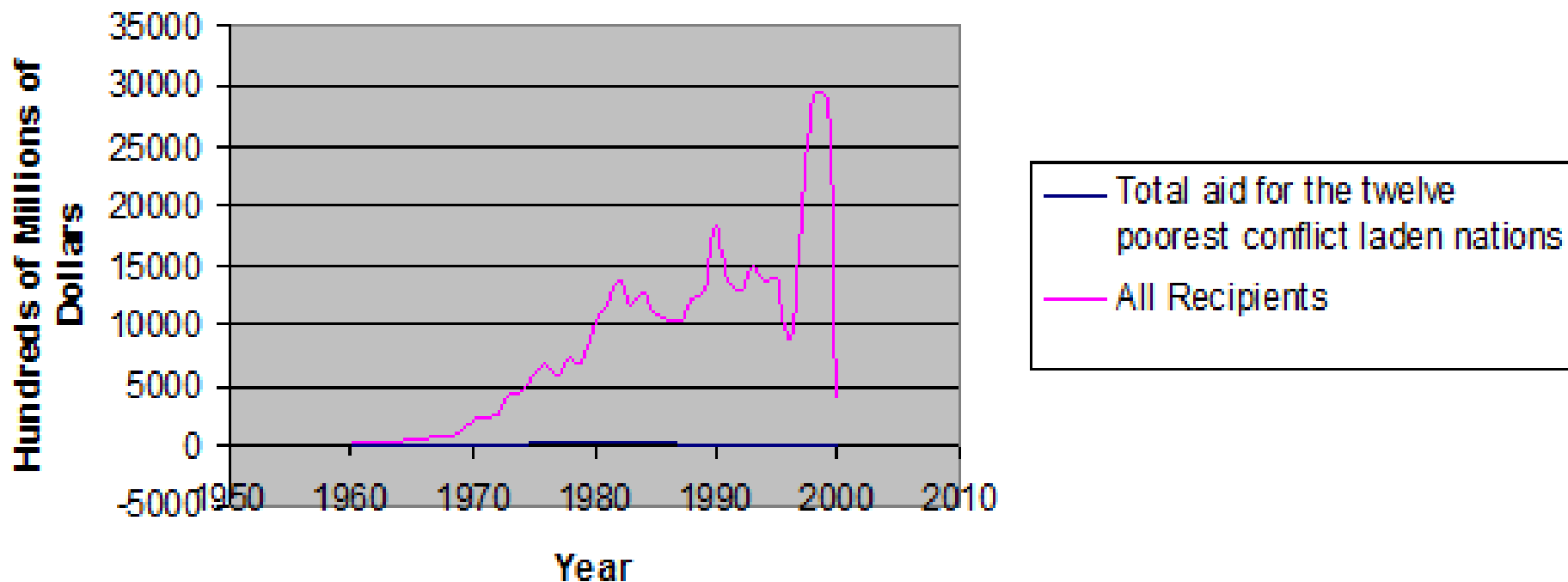
Highest aid goes to Gov. Adm. & Development Policy & Planning and lowest goes to Agriculture (Kibriya, Price et al 2010).

Financial Assistance for Different Sectors



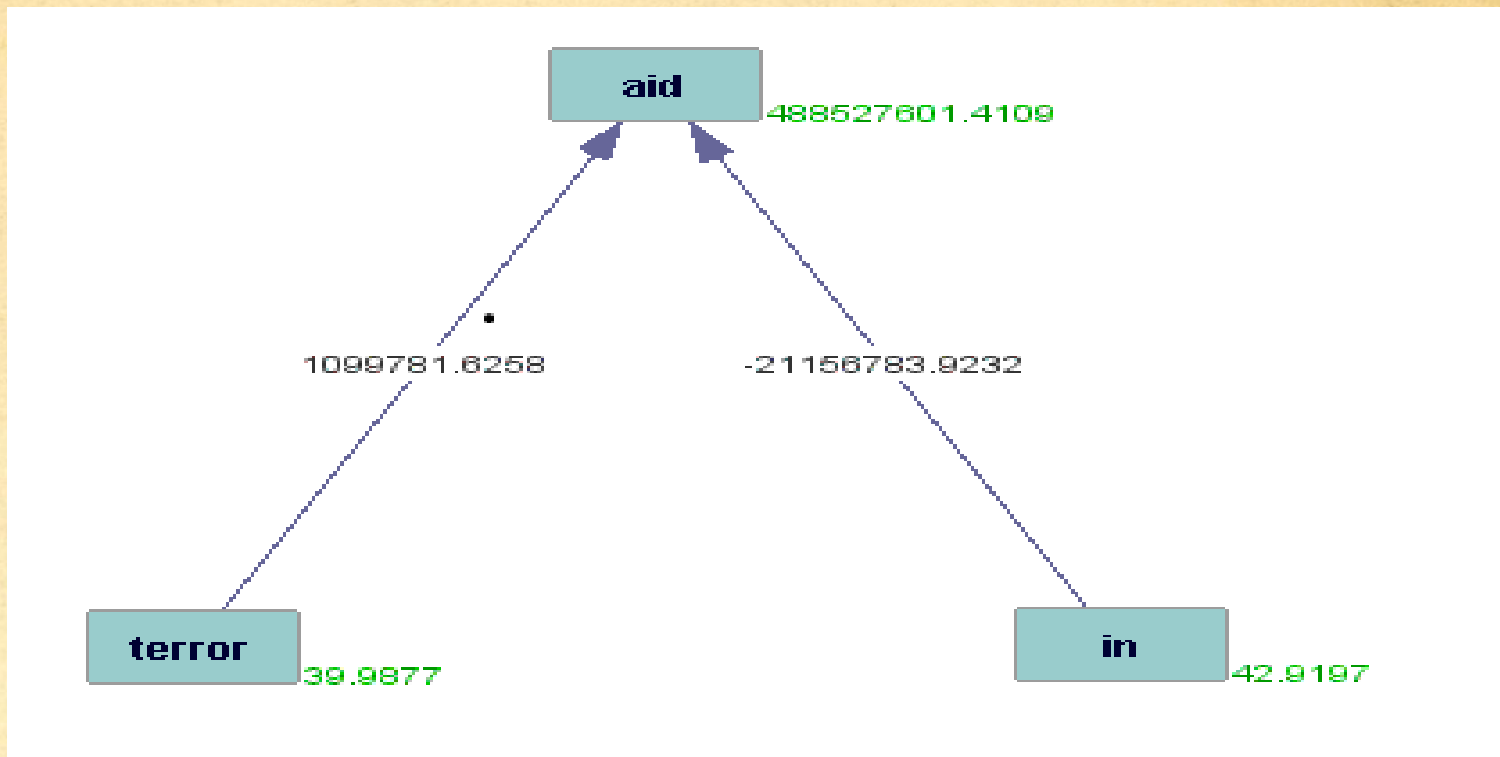
Poorest Countries Burundi, Ethiopia, Afghanistan, Eritrea, Haiti, Kenya, Sierra Leon, Liberia, Malawi, Rwanda, Myanmar and Central African Republic got under 1 % of foreign assistance 1950 - 2010.

Aid Comparison

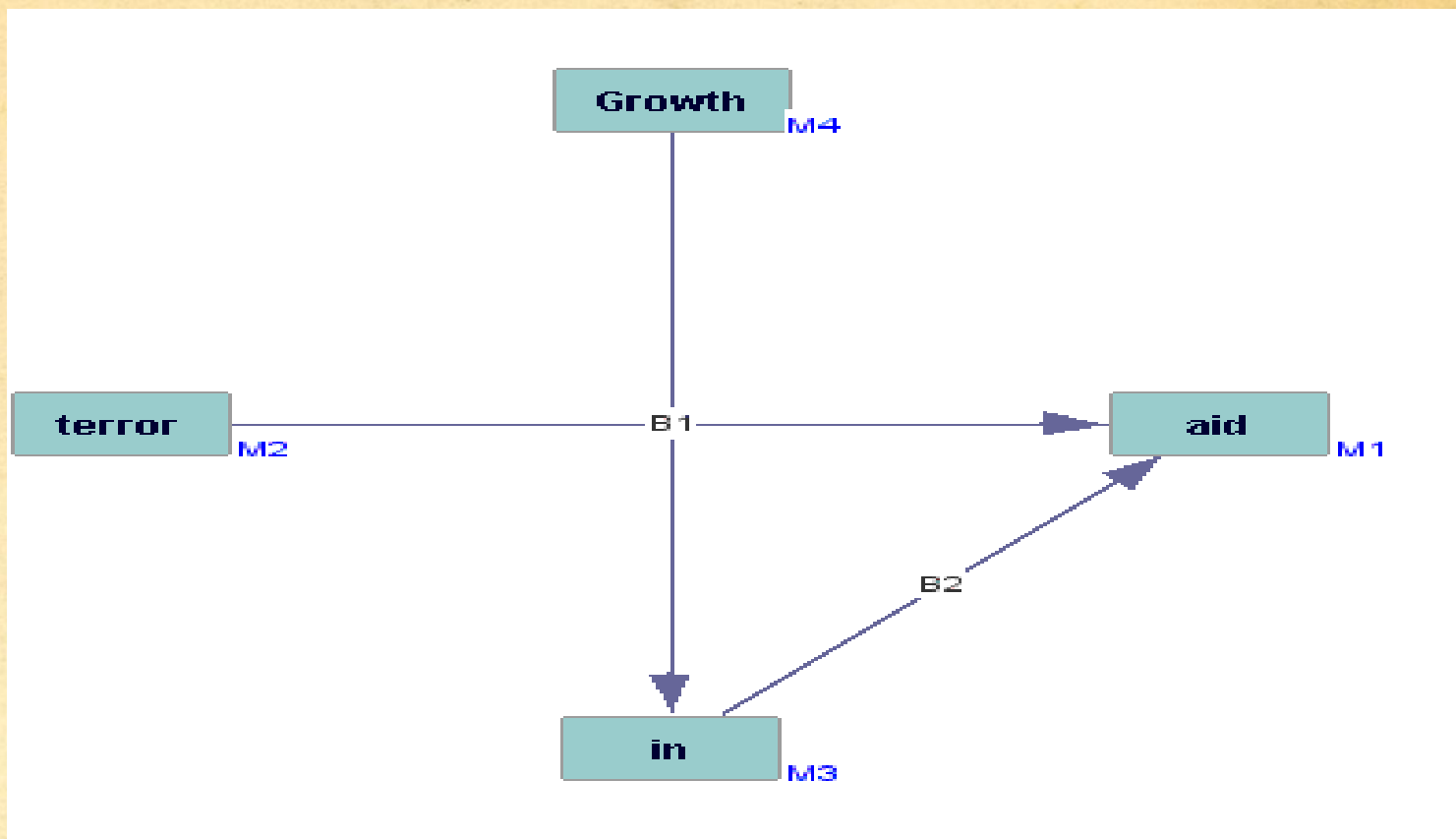


(Kibriya, Price et al 2010).

DAG Results



Dag results



Priorities in Fragile States

- Crop seed quality and varieties
- Animal breeds: Bovine and fish
- Diagnostic laboratory capability
 - Plant Disease
 - Animal Disease
 - Soil quality
 - Seed quality

Fragile States, Priorities Cont'd

- Farmer knowledge
- Tillage
- Varieties/management
- Efficient water use
- Youth programs
- Land rights

Priorities in Fragile States

- Livestock forage and feed
- Oilseed production and processing
- Agricultural credit



Community development by local universities

- Agricultural technology
- Agribusiness
- Youth leadership and entrepreneurship
- Health and Hygiene
- Education
- Natural resource rights
- Governance
- Infrastructure

...peace can not be built on empty stomachs...



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