CONSULTATIVE GROUP ON
INTERNATIONAL AGRICULTURAL RESEARCH

SNAPSHOT OF CGIAR IMPACTS

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Benefits of Agricultural Research

A recently published study estimating the value of the CGIAR's activities since its inception reports a benefit-cost ratio of 9.0 for the $7.12 billion (1990 US dollars) invested. This ratio rises to 17.3 when extrapolated through 2011 under the assumption that research benefits will continue to be realised at present rates. Thus, for every dollar invested in the CGIAR, $9 worth of additional food has been produced in the developing world, catalysing substantial additional "multiplier effects" for poor producers and consumers in the process.

Source: David A. Raitzer, 2003. *Benefit-Cost Meta-Analysis of Investment in the International Agricultural Research Centres of the CGIAR.* Report prepared on behalf of the CGIAR Standing Panel on Impact Assessment, Science Council Secretariat, Food and Agriculture Organization of the United Nations (FAO), September 2003, p. xv.

Economic Benefits of Crop Genetic Improvement Research

	Annual Benefits[1] ($ million)	Annual Costs ($ million)
Spring Bread Wheat[2]	2,500	70[3]
Rice (Southeast Asia only)[4]	10,800	28[3]
Maize (CIMMYT only)[4]	557–770	7–18

1 Benefits and costs are single year estimates for 1990 for Spring Bread Wheat and for 1998 for the other figures.
2 Byerlee, D. & G. Traxler. 1995. National and International Wheat Improvement Research in the Post-Green Revolution Period: Evolution and Impact. *American Journal of Agricultural Economics* 77: (pages 268–278.)
3 Total investment by CGIAR and National Agricultural Research Systems (NARS).
4 Evenson, R.E. and D. Gollin (eds.). *Crop Variety Improvement and its Effect on Productivity: The Impact of International Agricultural Research.*. Oxon, U.K.: CABI (pages 60, 96, 140, 156.)

CGIAR Contributions

New Rices for Africa (NERICAs)

NERICAs combine the high productivity traits of Asian rice and the ruggedness of native African rice varieties.

Benefits are:

- Labor saving for women farmers.
- Higher yielding (between 25–250%).
- Increased tolerance to droughts, pests and weeds.
- It is estimated that NERICAs are planted on 100,000 hectares and their use is spreading across Africa. In particular, NERICAs have been planted on 60,000 hectares in Guinea and on 10,000 hectares in Uganda.
- In Guinea alone, NERICAs have saved an estimated $13 million in rice imports.

CGIAR impact on prices, production, land use and trade

The following estimates of impact are derived from The International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) model developed by the International Food Policy Research Institute (IFPRI). They show what would have happened to world food production without CGIAR contributions:

- World food production would have been 4–5% lower and developing countries would have produced 7–8% less — exacerbating hunger, malnutrition, and poverty
- World food and feed grain prices would have been 18–21% higher — adversely affecting poor consumers
- Area planted to crops would have been significantly higher for all food crops, as cultivated area in developing countries would have expanded by 11 to 13 million hectares (and 5 to 6 million in industrialized countries), at the expense of primary forests and fragile lands with high biodiversity
- In developing countries, per capita food consumption would have declined by 5% on average, and up to 7% in the poorest regions — causing food, income, and nutrition insecurity
- Some 13–15 million more children would have been malnourished, predominantly in South Asia, where incidence of hunger is highest.

Source: R.E. Evenson and M. Rosegrant, 2003, The Economic Consequences of Crop Genetic Improvement Programmes. Pages 473–497 in R.E. Evenson and D. Gollin (eds.), Crop Variety Improvement and its Affect on Productivity — The Impact of Agricultural Research, CABI Publishing, UK. For more information, please visit www.ifpri.org

Quality Protein Maize (QPM)

- QPM planted on over 600,000 hectares in 25 countries, boosting food, nutrition, health and income security
- Has twice the amount of lysine, tryptophan — essential amino acids
- In Ghana, record yields of 7 tons per hectare achieved

The Green Revolution: Generating a Continuing Stream of Benefits

Yields of major crops in India (kg/ha)

	1961	1970	1980	1990	2000	Yield increase 1961–2000 (%)
Maize	957	1279	1159	1518	1822	90
Rice	1542	1685	2000	2613	2944	90
Wheat	851	1209	1436	2121	2778	264
All cereals	947	1135	1350	1891	2335	146

Source: FAOSTAT

Rice-Wheat Consortium of Indo-Gangetic Plains

Project promotes zero-till farming practices in rice-wheat cropping systems

- Most intensely cropped region in the world, covers 13.5 million ha
- Produces 45% of South Asia's food
- Home to 42% of population (and 400 million poor people)
- Cornerstone of food, income and nutrition security

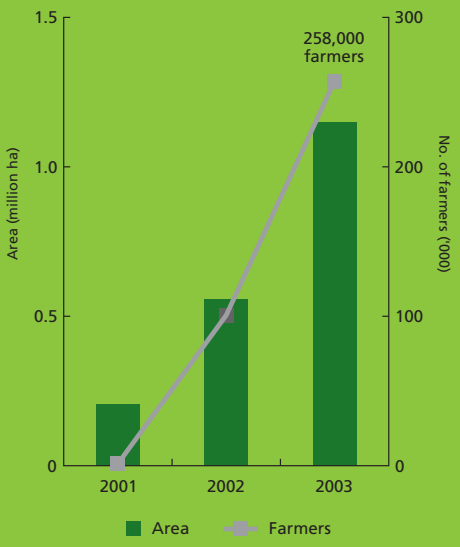
Partners

- Bangladesh, India, Nepal, Pakistan
- 5 CGIAR Centers
- Strong private sector participation (over 20,000 drills provided by 80 companies)
- Over 10 advanced research institutions

Select impacts (wheat)

- Increased yields (10–17% over conventional tillage)
- Reduced production costs ($65–180 per hectare)
- Conserves resources (water, diesel, herbicides)

Zero till area is expanding rapidly and more and more farmers are benefiting from this technology



Source: Rice-Wheat Consortium for the Indo-Gangetic Plains, Highlights 2003–2004.

"There is little doubt of the continued necessity of investment in agricultural research at the global level."

World Bank's Operations Evaluation Department Report, 2003

"We recognize the CGIAR is a
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James D. Wolfensohn, President, World Bank, 2

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Communique, 2003

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