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**Working Paper**

## Whither global agriculture? Research needs

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# Whither Global Agriculture? Research Needs

**NZ Trade Consortium Working Paper no 28**

**Robert L. Thompson  
Wellington, New Zealand  
9 October 2003**

The New Zealand Trade Consortium  
in association with the  
New Zealand Institute of Economic Research (Inc)

# Outline of Presentation

- Growth in World Food Consumption
- Agricultural Production Prospects
- Implications for Future Agricultural Trade
- The Role of Public Policies
- Trade Liberalization
- Research and Communications Needs

# Growth in Global Food Demand

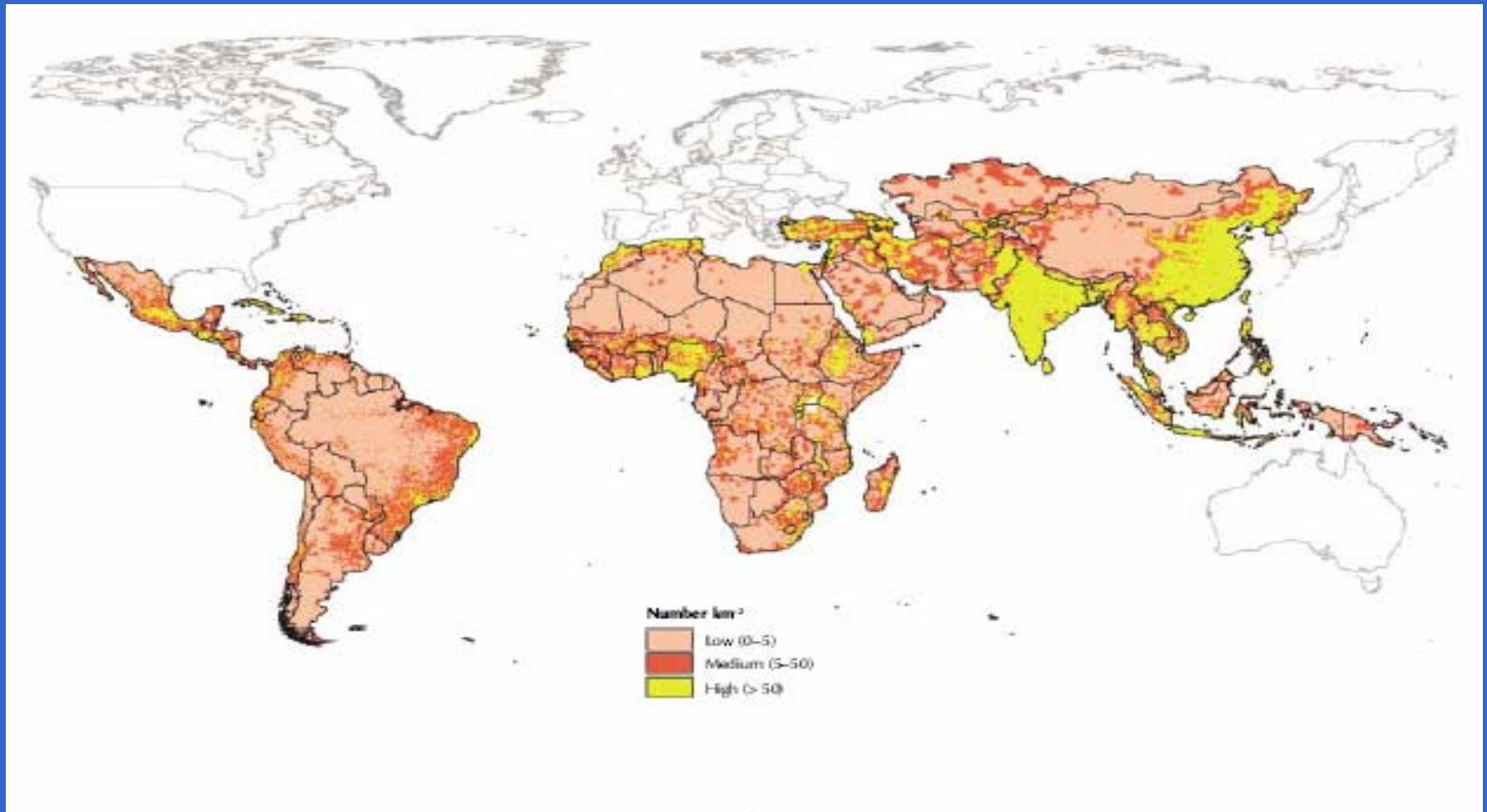
# Population

- The U.N. projects world population will grow from 6.0 to almost 9.2 billion between 2000 and 2050 (median projection)
- The median projection has built in modest reductions for on-going population control programs and HIV/AIDS, esp. in Africa.
- Faster broad-based economic growth, more job opportunities for women outside the home, and broader educational opportunities for girls could reduce population growth rates further.

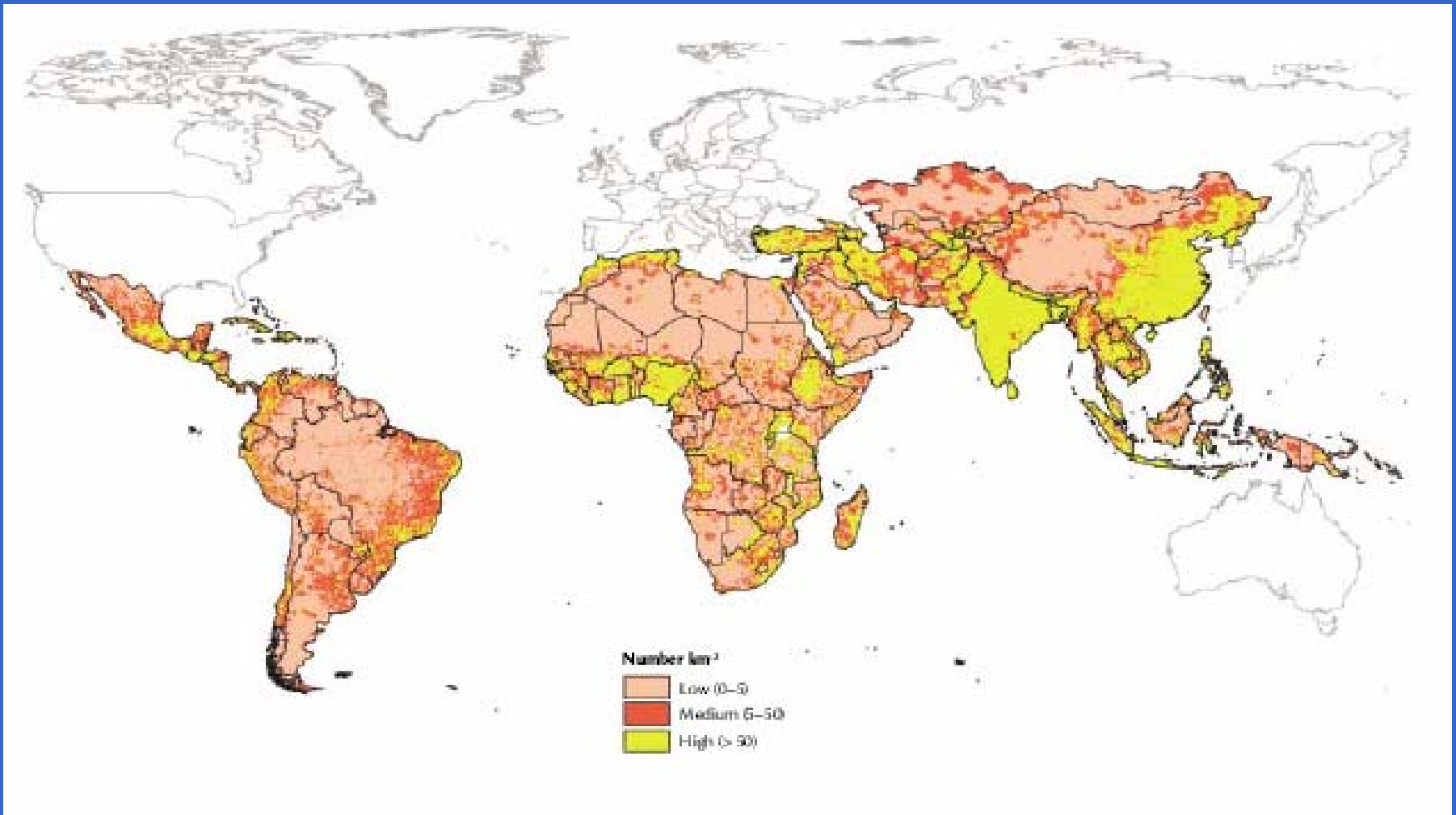
# Population Growth (PRB projections)

• <u>Region</u>	<u>2003</u>	<u>2025</u>	<u>2050</u>
• World	6,314	7,907	9,198
• High Income	1,202	1,260	1,257
• Low Income	5,112	6,647	7,940
• Africa	861	1,289	1,883
• Asia	3,830	4,776	5,353
• Latin America	540	690	789

# Population Density, 2000



# Population Density, 2050

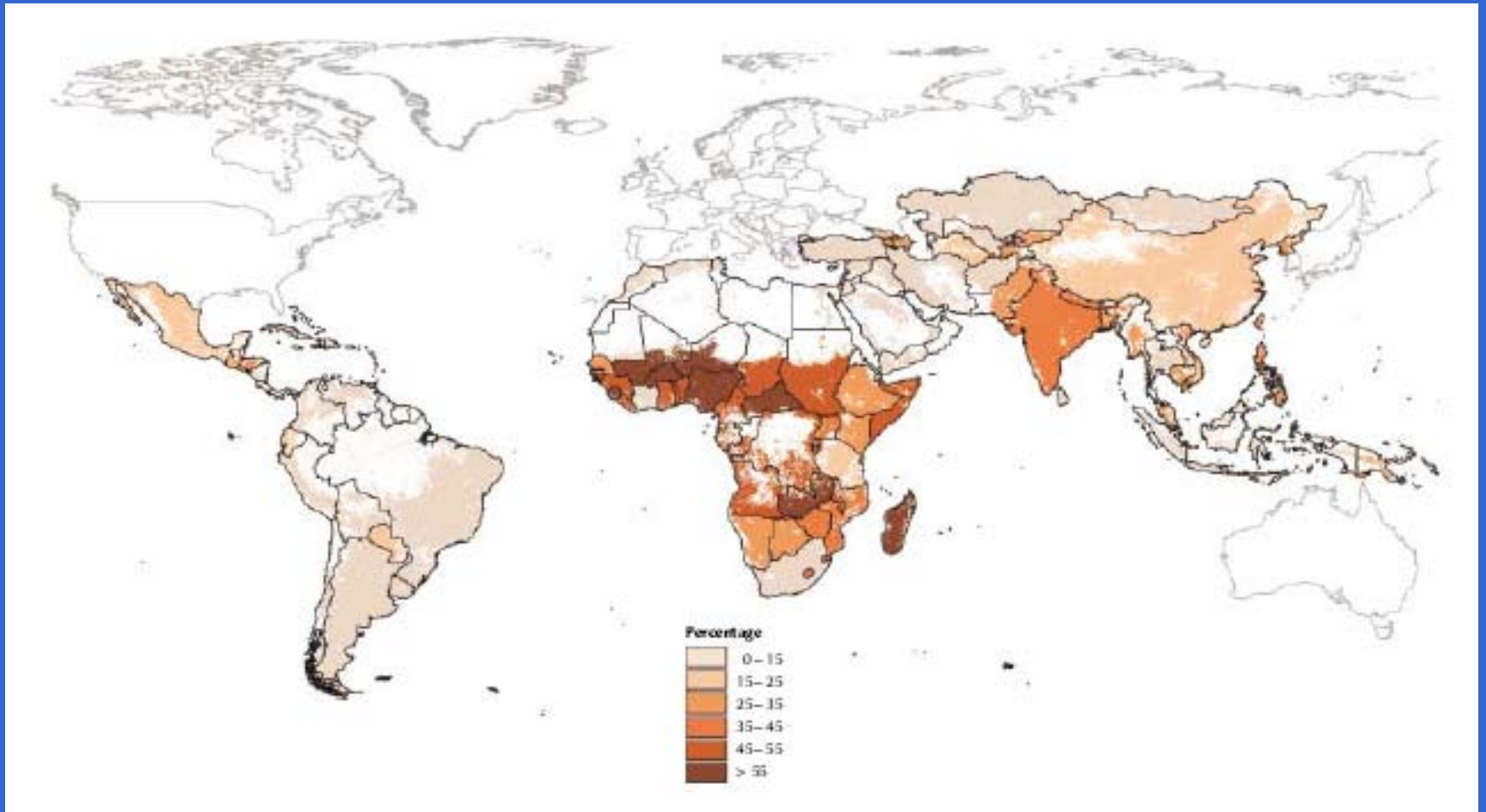




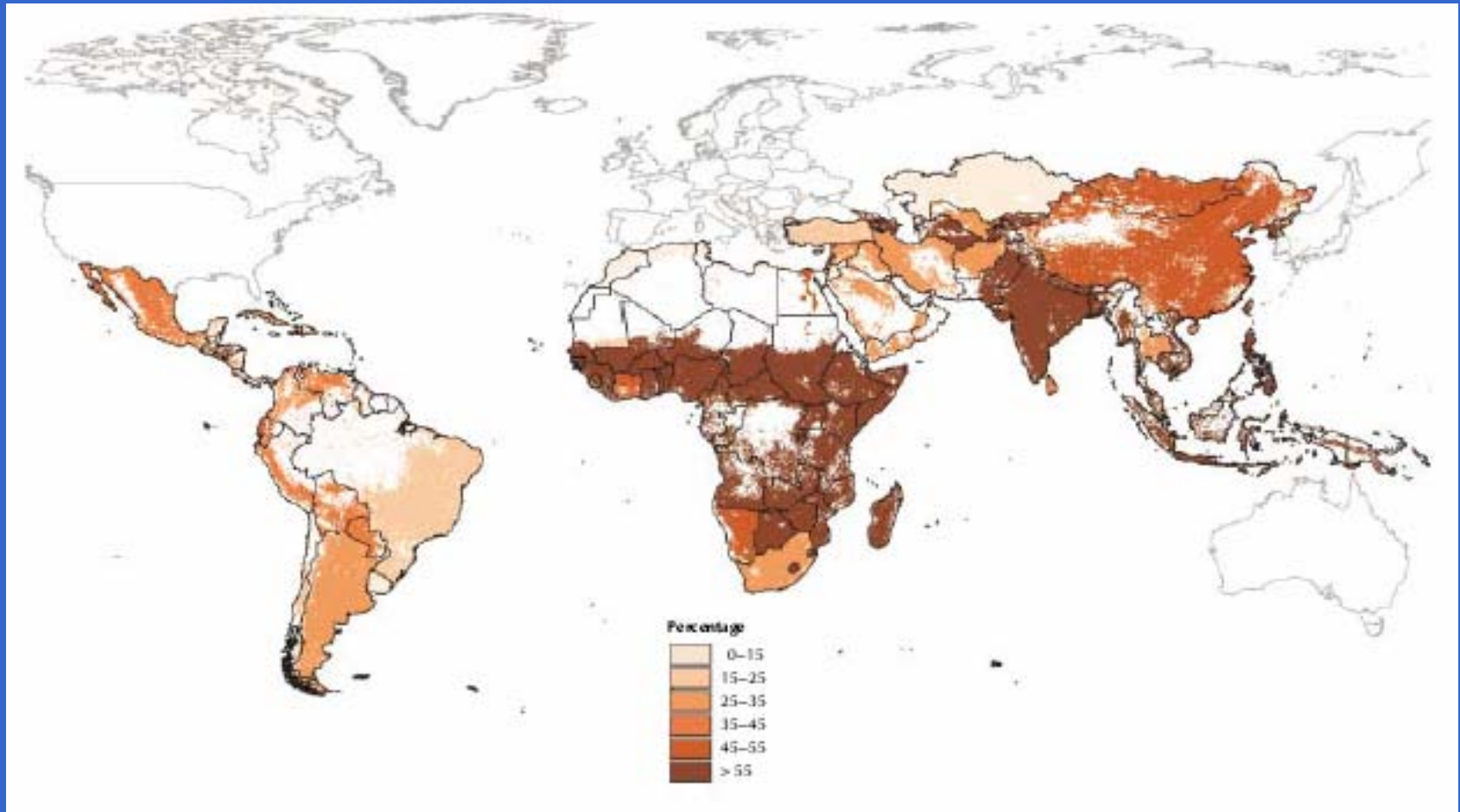
# Poverty and Hunger

- 1.25 billion people live on less than \$1 per day; 70% of them are rural, and most of these depend on farming, forestry or fishing for the meager incomes
- 3 billion (half of the world's population) live on less than \$2 per day.
- 700 million people suffer under-nutrition or hunger.
- Hunger is due mainly to poverty except in times of war, natural disaster or politically-imposed famine.
- Broad-based economic growth that reduces poverty will solve most hunger – and add substantially to world food demand.

# One Dollar Per Day Poverty



# Two Dollars Per Day Poverty



# Effects of Income Growth

- Very low income people spend the first increments in purchasing power on the needs of life, esp. food staples.
- As incomes rise further, diets start to change with addition of fruits, vegetables, edible oils; animal protein
- By US\$3,000 per capita income, people start to purchase processed and packaged foods
- In rich countries further income growth adds little to total demand for agricultural products, but the mix of what products are consumed may change and demand for further processing, convenience, and packaging rises.
- Broad-based economic growth can add as much to global food demand as population growth

# Role of Farming in Poverty Reduction

- Many NGO activists exaggerate potential role of small-scale farming in solving rural poverty problem
- You cannot grow enough on one hectare to feed a family and generate enough cash income to escape poverty
- No country has solved the problem of rural poverty in agriculture alone
- Rural-urban migration is normal and essential.
- The number of farmers must fall.
- All presently rich countries created non-farm rural employment, so that most farm families earn most of their income off the farm.

# Agricultural Production Prospects

# Physical Constraints

- The physical environment – soils, climatic conditions (averages as well as variances) and topography – constrain what can be grown where.
- Investments in agricultural research and irrigation can relax some physical constraints and expand productive potential.
- Public policy then determines whether it is profitable for farmers to adopt a new technology.

# The Land Constraint

- There is at most 12% more arable land available that isn't presently forested or subject to erosion or desertification – and degradation of many soils continues.
- Keen competition is coming for available land among food, fiber and energy production, commercial forest production, and conservation of forests.



# Growing Demands on Forests

- The same forces of population and income growth that increase demand for food also increase demand for things made out of wood, e.g. paper, furniture, building materials; poles.
- In rich countries, growing demand for environmental amenities and preservation of (especially old-growth) forested areas.

# The Only Sustainable Way Ahead

- The area of land in world food production could be doubled...
- But only by massive destruction of forests and loss of wildlife habitat, biodiversity and carbon sequestration capacity
- The only environmentally sustainable alternative is to double productivity on the fertile, non-erodible soils already in crop production.

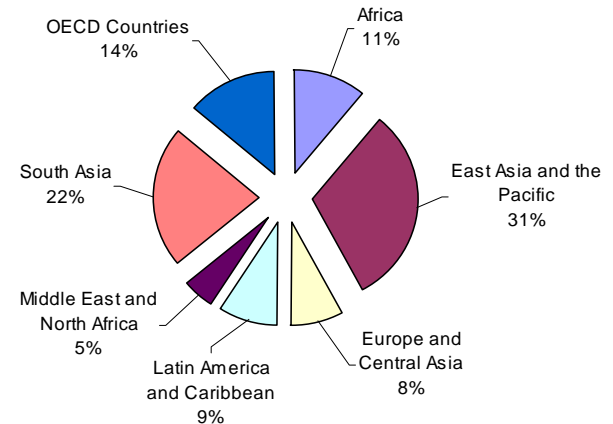
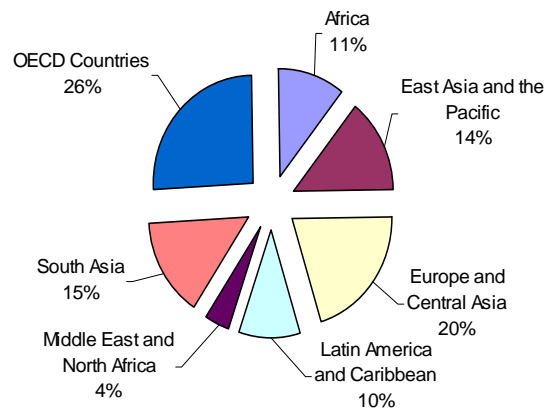
# Water A Growing Constraint

- Farmers use 70% of the fresh water used in the world. They are both the largest users and the largest wasters of water.
- Water is priced at zero to most farmers, signaling that it is much more abundant than in reality. Anything priced at zero will be wasted.
- With rapid urbanization, cities are likely to outbid agriculture for available water.
- The world's farmers need to double food production using less water than today.

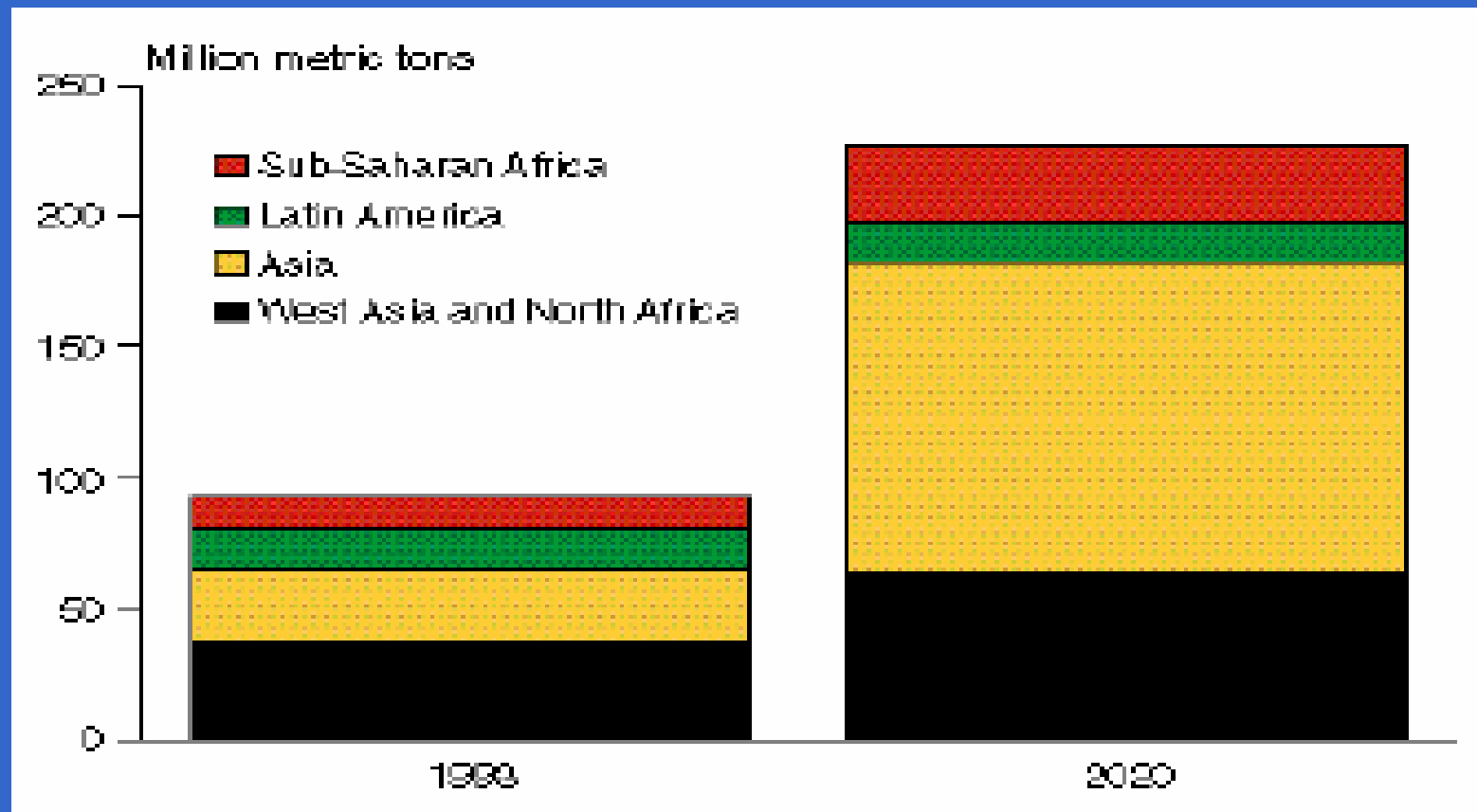
# Growing World Agricultural Trade

- The world's arable land is not distributed around in the world in the same proportions as is population.
- Agriculture in most LDCs is underperforming relative to its potential consistent with economic efficiency and environmental sustainability.
- With population and income growth and urbanization in LDCs, a larger fraction of world food production is expected to move through world trade.
- Broad-based economic development in LDCs will accentuate this via growing commercial trade.
- Stagnating economies and farm sectors will accentuate the trend through growing need for food aid.

# The World's Arable Land (left) Is Distributed Very Differently than Its Population (right)



# 1993 Net Cereal Imports and IFPRI 2020 Projections



# The Policy Environment

# World Agriculture in Disarray

- Distort domestic terms of trade in favor of politically powerful commodities/groups
- Subsidies tied to output of specific commodities stimulate larger production in less efficient locations, depriving more efficient producers of export possibilities
- Subsidies justified on basis of low farm income but distributed in proportion to sales are ultimately bid into land prices, benefiting large farmers & land-owners



# OECD Producer Support Estimates, 2002, in Percent

Switzerland	75
Japan	59
European Union	36
Mexico	22
Canada	20
United States	18
Australia	5
New Zealand	1

# Average Producer Support in OECD Countries, 2002, in Percent

Rice	80
Sugar	48
Milk	48
Beef & Veal	37
Wheat	36
Maize	20
Oilseeds	18
Wool	6

# The Global Trading Environment Hurts LDC Agriculture

- OECD protectionist barriers to LDC goods reduces their foreign exchange earning capacity and economic growth.
- OECD agricultural production and export subsidies depress world market prices below long term trend and increase variance around that trend.
- Food aid is most available in years of OECD surplus, not LDC deficit.
- LDCs haven't gotten much out of past agricultural trade agreements.

# World Market Prices Depressed Below Long Term Trend (World Bank, 2003)

Rice	33 - 50 %
Sugar	20 – 40 %
Dairy Products	20 – 40 %
Cotton	10 – 20 %
Ground nuts (peanuts)	10 – 20 %

# LDCs' Own Policies Also Impede Their Agricultural Development

- Corruption and/or macroeconomic instability.
- Lack of definition and/or enforcement of property rights and contracts
- Underinvestment in public goods, such as rural infrastructure and ag research (Green Box)
- Cheap food policies to keep urban consumers quiescent – often reinforced by food aid or subsidized exports from OECD
- Lack of technology adapted to local agro-ecological conditions (soils, climate; slope)

# Uruguay Round Agreement on Agriculture: Accomplishments

- Increased market access as % of consumption
- Reduced export subsidies (value & volume)
- Converted all non-tariff barriers to tariffs
- Required scientific basis for all SPS barriers
- Acknowledged that some domestic agricultural subsidies can distort trade and categorized them by degree of trade distortion:
  - “Green box” = non trade distorting investments in public goods and decoupled income transfers
  - “Amber box” = trade-distorting (bound and reduced)
  - “Blue box” = trade-distorting, but offset by production controls or set-asides

# Doha Round Must Do Better

- Uruguay Round established a useful framework
- But, it did little to open markets, and OECD countries are still spending close to US\$1 billion per day subsidizing their farmers
- Doha Round can and must be more ambitious than the Uruguay Round by closing loopholes and imposing stronger controls and tighter disciplines to prevent circumvention of the intent of the agreement.

# Research & Communication Needs

- Debunk myths popularized by NGOs and other opponents of trade liberalization
- PSEs for LDCs and developing countries; reconcile negative PSEs with tariff protection; alternative sources of tax revenue in LDCs lowering tariffs
- Link between agricultural trade liberalization and poverty reduction
- Value of preferences to LDCs; Who really gets benefits? Rent seeking?
- Agricultural adjustment
  - design transition strategies to neutralize political opposition to reform in OECD countries
  - Design transition strategies for LDCs to compensate for losses of losers from liberalization and to increase competitiveness



# More Research Needs

- Disequilibrium exchange rates
- Specific tariffs
- How production neutral are “decoupled” income transfers in Green Box?
- Costs of protectionism in commodities important to LDCs, e.g. rice, cotton; sugar
- Welfare effect of depressing ag prices on low income rural households (net sellers or buyers)
- Implications of factor intensity reversals and non-homothetic preferences in agriculture
- Estimate decline in income elasticities for food as incomes rise from very low levels

# More Research

- Impacts (macro and micro) of international commodity market price volatility on LDCs
- Implications of WTO adopting UN definition of “developing country”
- Dynamic effects of ag trade liberalization
- Improve policy variables in GTAP
- With agronomists improve estimates of substitutability among crops in different agro-ecosystems
- Document rural poverty reduction success stories and relate to openness of economies
- Economics of irrigating row crops

[www.agritrade.org](http://www.agritrade.org)

# Addendum:

## IPC Recommendations for Doha Round Agricultural Negotiations

# International Food & Agricultural Trade Policy Council

- 37 former trade negotiators and senior government officials, agribusiness executives, farm leaders, and academics from 21 countries (including Cairns Group, European Union, LDCs, developing countries, Japan; USA)
- Consensus: Despite gaps in national proposals and pessimism in some capitals, there are politically viable compromises to move agricultural trade liberalization beyond Uruguay Round

# Improve Market Access

- Expand minimum market access quotas each year
- Establish a maximum tariff rate and reduce all tariff peaks to that maximum
- Require a minimum tariff cut to *each* product and at least the average tariff cut to *each* tariff chapter
- Eliminate in-quota tariffs immediately
- Reduce escalation of tariffs with degree of processing

# Address Importers' Concerns

- Update national consumption base for minimum market access to recent period
- Institute transparent safeguard mechanism (with bound triggers and time-limits) for both developing and developed countries.
- Ban export embargoes and restrictions
- Address Net Food Importing LDCs concerns through foreign aid, not WTO
- Now is not the time to reopen the SPS Agreement.

# Reduce Trade Distorting Support

- Tighten criteria for decoupled income transfers to be classified as Green Box (non-trade-distorting)
- Reduce Amber Box, Blue Box (supply controlled) and other product specific support
- Make reductions commodity by commodity



# Non-trade Concerns

- It is not WTO's role to question policy rationale, but to discipline policies
- Non-trade concerns best addressed through Green Box measures
- If specific commodity support or on-going subsidies are needed, classify as Amber Box

# Discipline Export “Competition”

- Eliminate export subsidies by date certain
- Discipline export credits, food aid and state trading entities (esp. single desk)
- Reduce and harmonize export taxes

# Special & Differential Treatment for LDCs & Developing Countries

- Definition of “developing” country
- Shallower tariff cuts over longer period
- Eliminate tariffs and quotas for LDCs (transform special preferences into general preferences)
- Don't cap Green Box investments in public goods