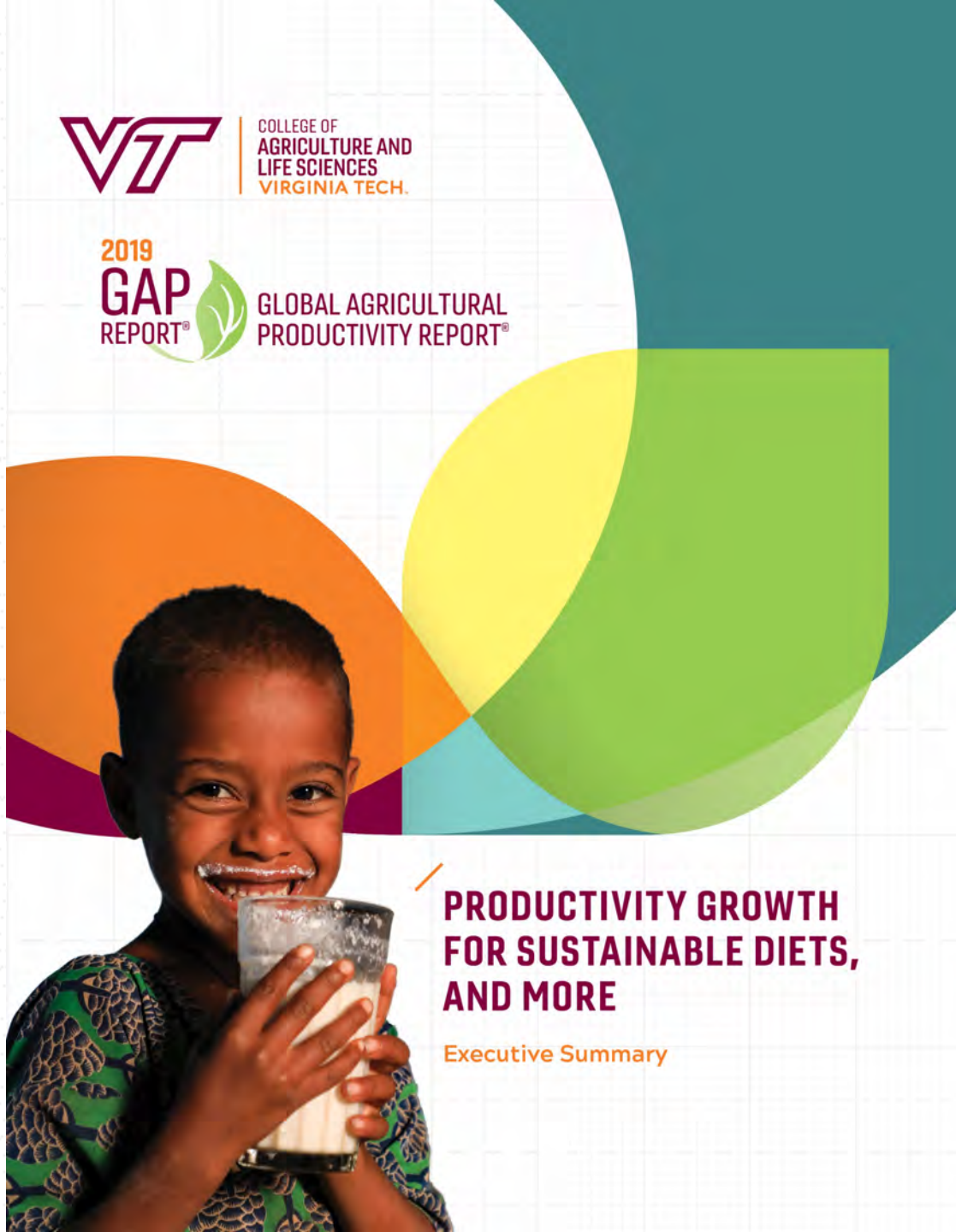
Global Agricultural Productivity Report

presented by

Virginia Tech

College of Agriculture and Life Sciences



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SoAR FOUNDATION

Sustainable agriculture…

- satisfies human needs;
- enhances environmental quality and the natural resource base;
- sustains the economic vitality of global and local food and agricultural systems, and
- improves the quality of life for society as a whole.

Sustainable growth is…

meeting the needs of the present without compromising the ability of future generations to meet their own needs.

ARE WE DOING ENOUGH?

Agriculture accounts for 24% of global greenhouse gas emissions and 71% of fresh water use.

Soil erosion and desertification have cut land productivity in some parts of the world by ½.

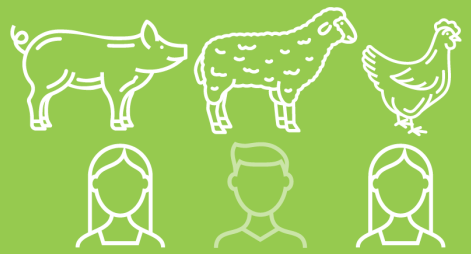
150.8 million children under 5 are stunted and 383.3 million are overweight.

56 million people live in conflict zones and urgently needs food assistance.

Natural disasters in developing countries caused $96 billion in damaged or lost crop and livestock production.

GLOBAL AGRICULTURAL SUSTAINABILITY IMPERATIVE

EAT

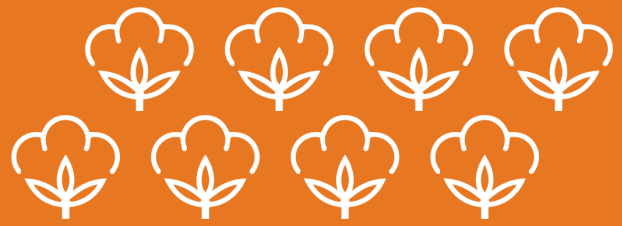


500+ MILLION PEOPLE DEPEND ON LIVESTOCK FOR THEIR LIVELIHOODS; 2/3 ARE WOMEN

4.2 TRILLION GALLONS OF IRRIGATION WATER WOULD BE NEEDED TO PRODUCE THE FOOD WASTED IN U.S. ANNUALLY

USE

1/3 OF GLOBAL POPULATION DEPENDS ON FORESTS FOR INCOME, EMPLOYMENT, FOOD, FUEL & MEDICINE



MOST OF THE INCREASE IN COTTON PRODUCTION IN THE NEXT 10 YEARS WILL COME FROM CULTIVATING NEW LAND

ENJOY

IF U.S. DOGS & CATS WERE A SOVERIGN NATION, THEY WOULD BE THE 5TH LARGEST CONSUMER OF ANIMAL PROTEIN IN THE WORLD

800 COASTAL ECOSYSTEMS ARE STRUGGLING WITH ALGAE BLOOMS OR OTHER PROBLEMS DUE TO EXCESS NUTRIENTS

STRATEGIES FOR MEETING GLOBAL DEMAND

LAND EXPANSION

INPUT INTENSIFICATION

EXTEND IRRIGATION

TOTAL FACTOR PRODUCTIVITY (TFP)

PRODUCTIVITY IS NOT THE SAME AS...

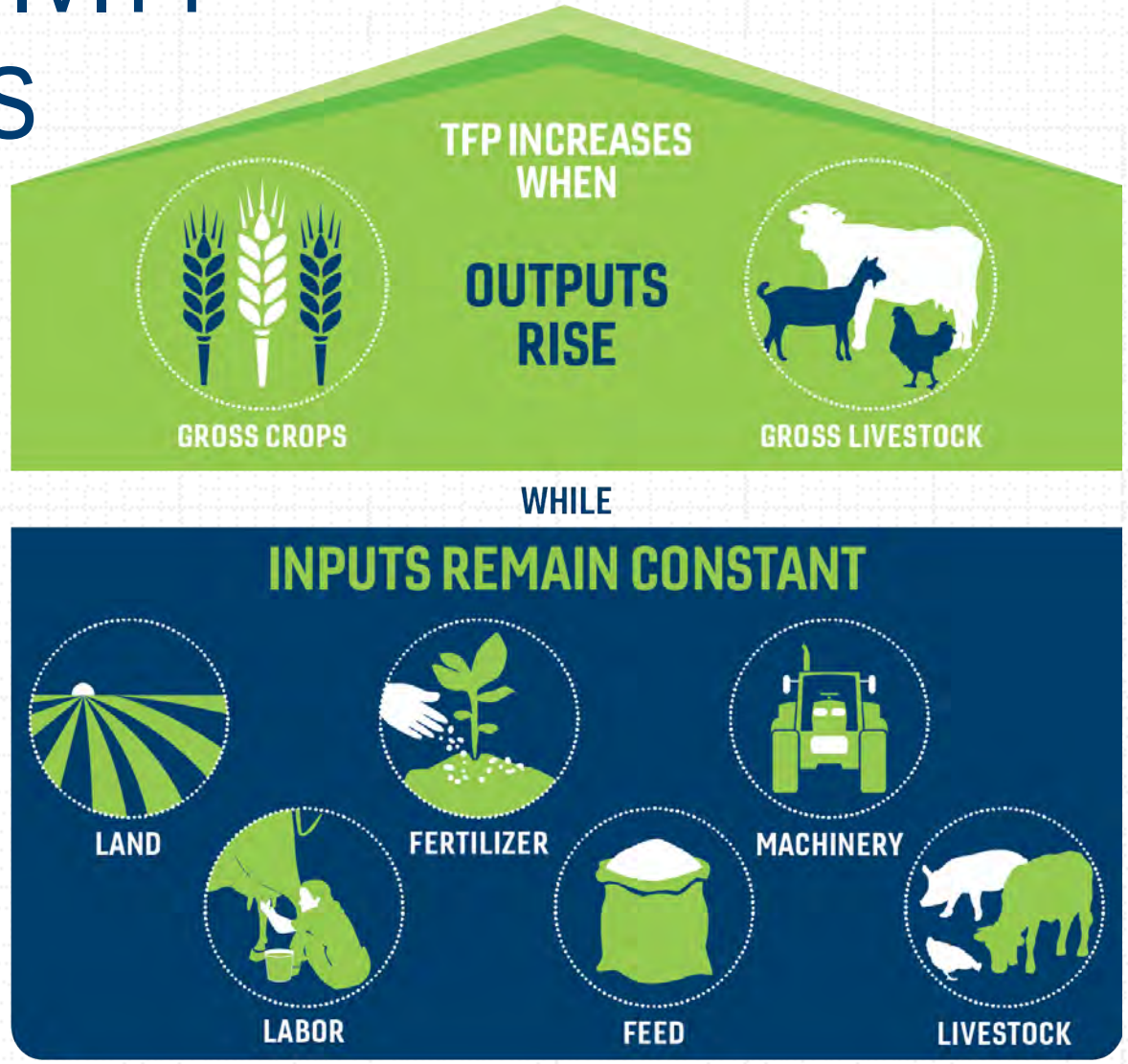
OUTPUT

GROSS AMOUNT OF CROPS OR LIVESTOCK PRODUCED

YIELD

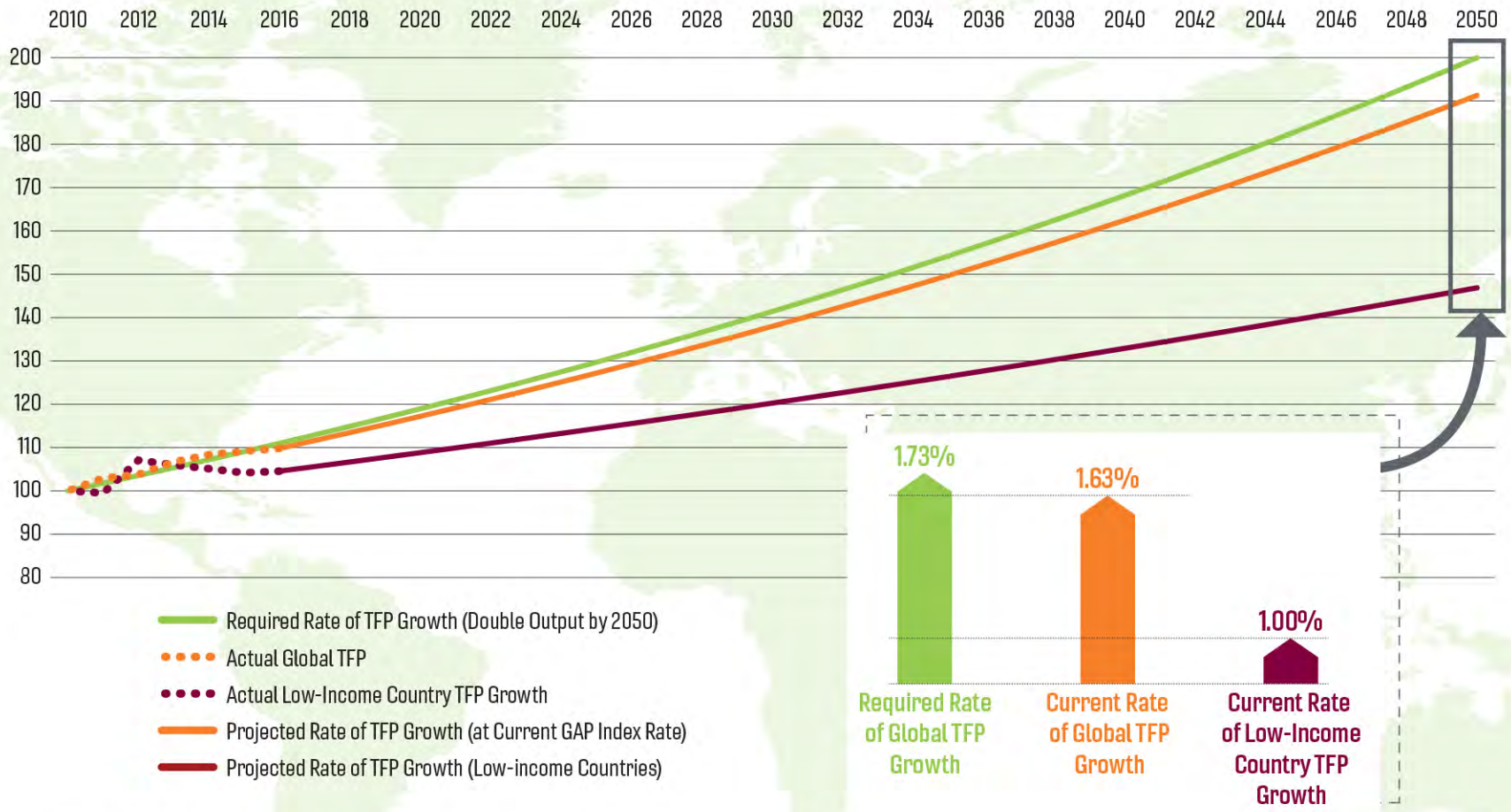
AMOUT OF OUTPUT PER UNIT OF PRODUCTION

TOTAL FACTOR PRODUCTIVITY MEASURES CHANGES IN THE EFFICIENCY WITH WHICH INPUTS ARE TRANSFORMED INTO OUTPUTS



2019 Global Agricultural Productivity Index

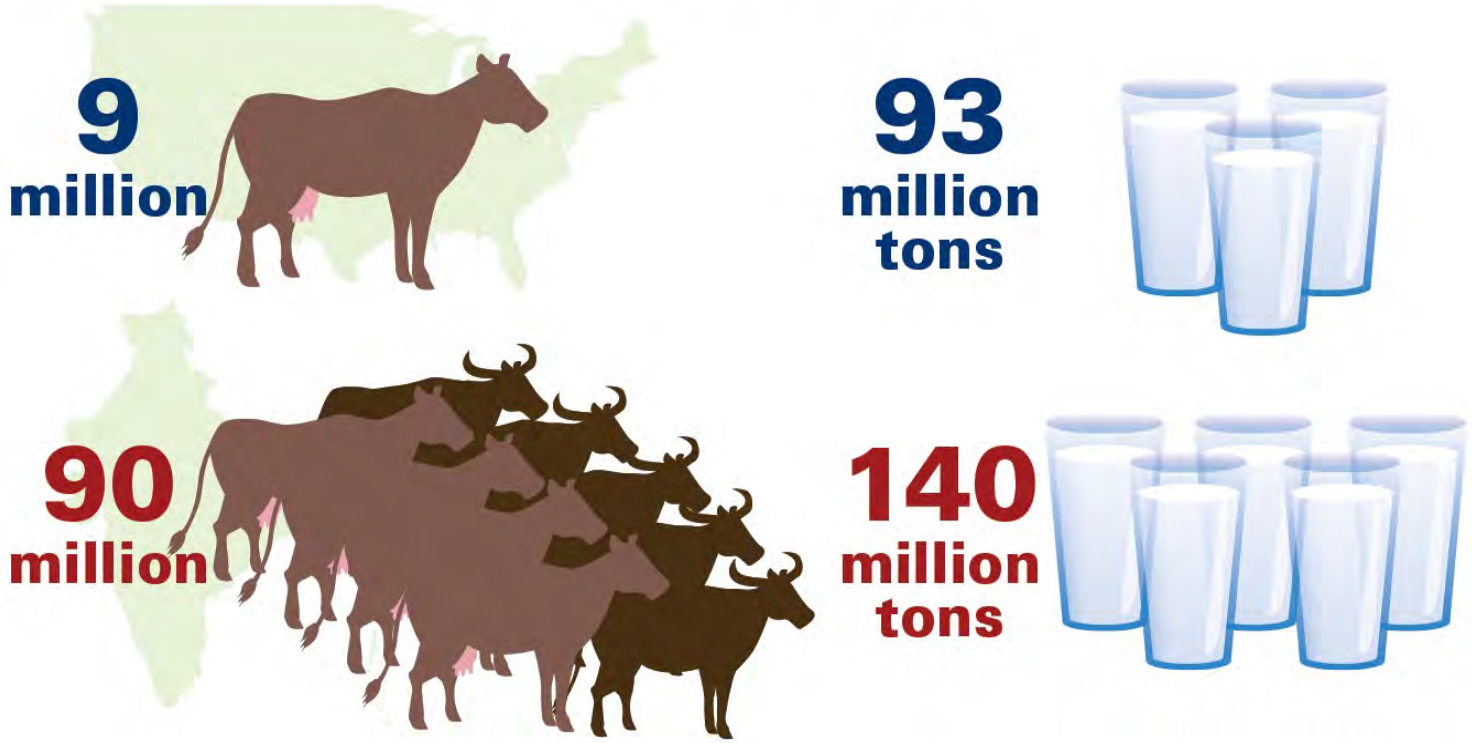
Total Factor Productivity (TFP) is a ratio that measures changes in how efficiently agricultural inputs are transformed into outputs.



Source: Current and projected TFP growth provided by USDA Economic Research Service (2019).

PRODUCTIVITY – FOOD SECURITY - SUSTAINABILITY

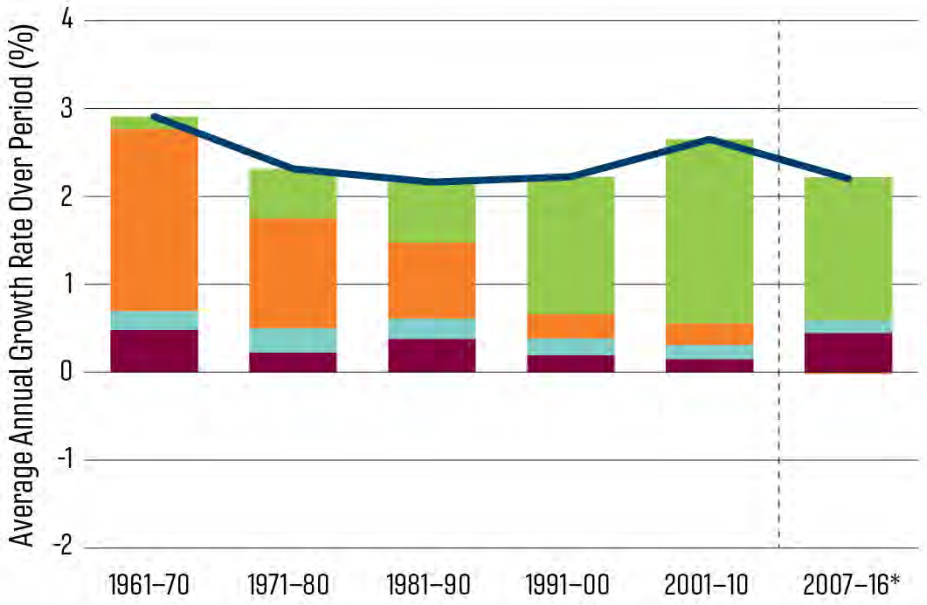
MEETING INDIA'S MILK DEMAND



India has 10 times as many dairy-producing bovines as the U.S., but produces only 50 percent more milk. FAOSTAT (2014).

AT CURRENT MILK YIELDS, INDIA WILL NEED AN ADDITIONAL 20 MILLION DAIRY ANIMALS TO MEET DOMESTIC DEMAND IN THE NEXT 10 YEARS.

Sources of Growth in Agricultural Output: **Global**, 1961–2016



TFP — Gross amount of crop and livestock outputs per inputs of labor, capital and materials

Inputs/Land — Gross amount of fertilizer, machinery, feed and labor per hectare of agricultural land

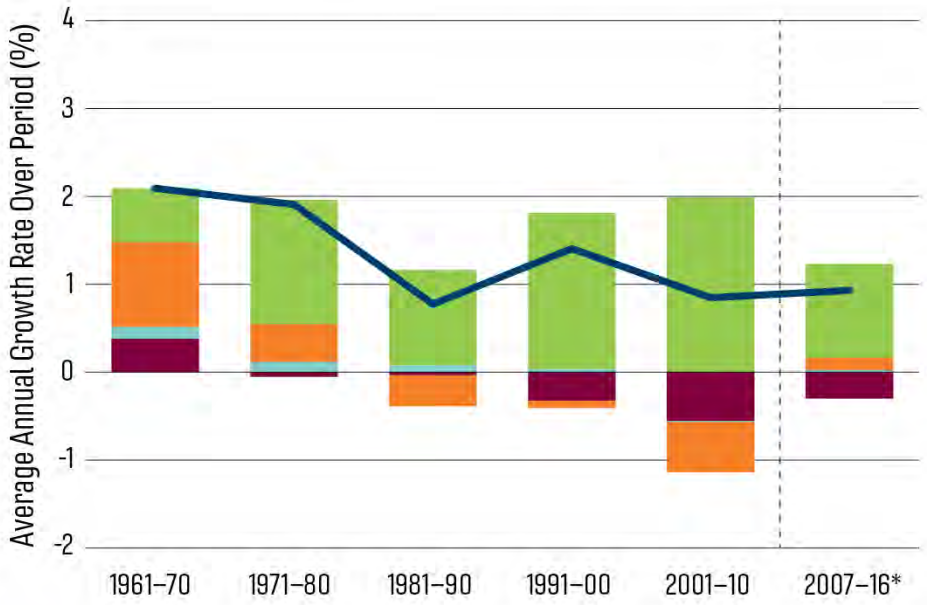
Irrigation — Extension of irrigation to agricultural land

Land Expansion — Extending agriculture to previously forested areas or grasslands

Agricultural Output Growth Rate

*Depicts data for the most recent ten-year period.
Source: USDA Economic Research Service (2019).

Sources of Growth in Agricultural Output: **High-Income** Countries, 1961–2016



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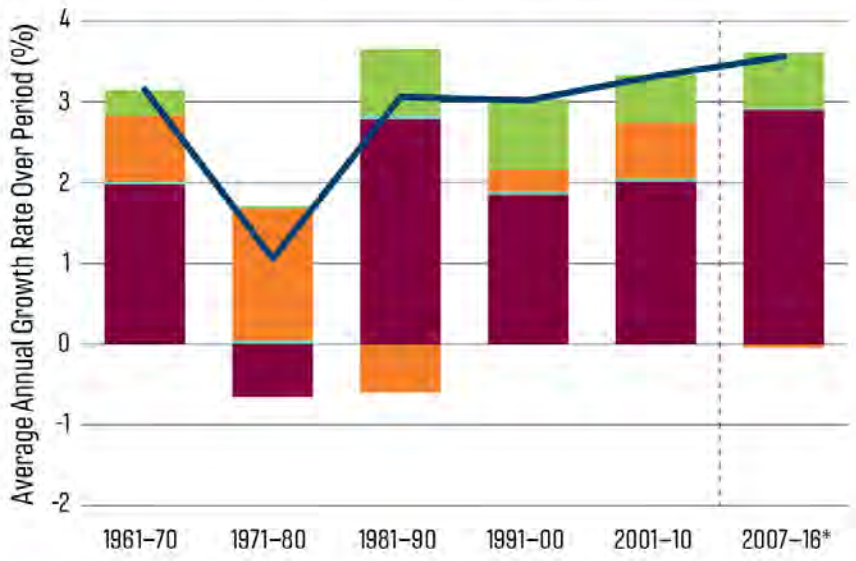
DRIVERS OF LAND USE CHANGE

Changing consumption patterns

Population growth

Levels of agricultural productivity

Sources of Growth in Agricultural Output: **Sub-Saharan Africa**, 1961–2016



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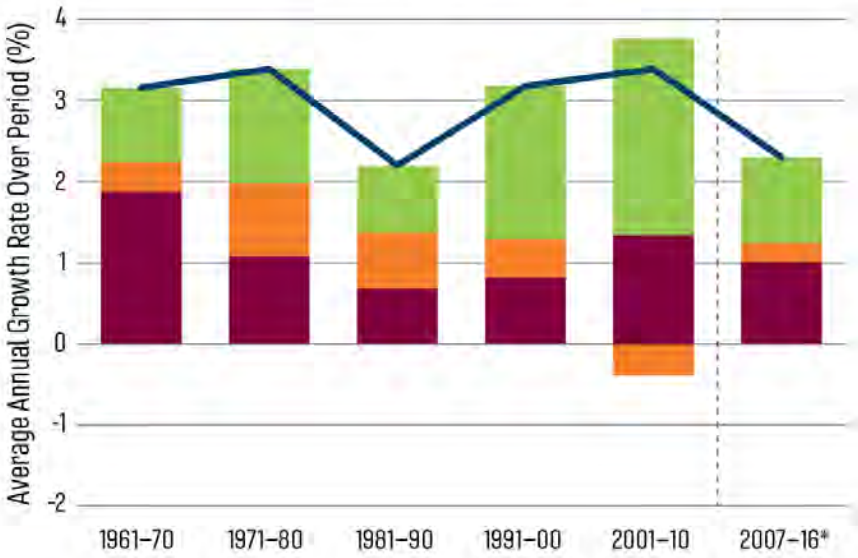
Sources of Growth in Agricultural Output:
Latin America, 1961–2016



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Source: USDA Economic Research Service (2019).

AG TECH + BEST PRACTICES + ATTENTION TO ECOSYSTEM SERVICES = SUSTAINABLE PRODUCTIVITY GROWTH

CROP GENETICS

TILLAGE MANAGEMENT

SOIL HEALTH

DIVERSIFICATION

RUMINANT RECYCLERS

PEST CONTROL AND POLLINATION

INTEGRATED AQUACULTURE

WATER & NUTRIENT MANAGEMENT

Reduce post-harvest loss and food waste

Improve access to markets for agricultural inputs and outputs

Invest in public agricultural R&D and extension

Expand regional and global trade

Embrace science-based and information technologies

Cultivate partnerships for agricultural development, gender equity & improved nutrition

Power of Partnerships

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