SGRA 16th Sustainable Shared Growth Seminar
The Urban-Rural Gap and Sustainable Shared Growth
August 23, 2013
College of Engineering
University of the Philippines

THE DIRI MODEL: A MODEL FROM NEGROS

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関口グローバル研究会

www.aisf.or.jp/sgra-in-english

DIRI Model

- Downstream-Integrated Radicular Import-Substitution Model (in cooperation with Dr. Joe Medina, Mr. Nonoy Moraca, and Mr. Ramon Uy)
  - To make the model widely available to practitioners and researchers
- Quotes from Mr. Ramon Uy (social entrepreneur of Negros)

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

There is a saying that " a person who wakes-up early in the morning and works all day deserves to be rich" but how come our farmers are still poor today?

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

DIRI Model

Where are these machines made?

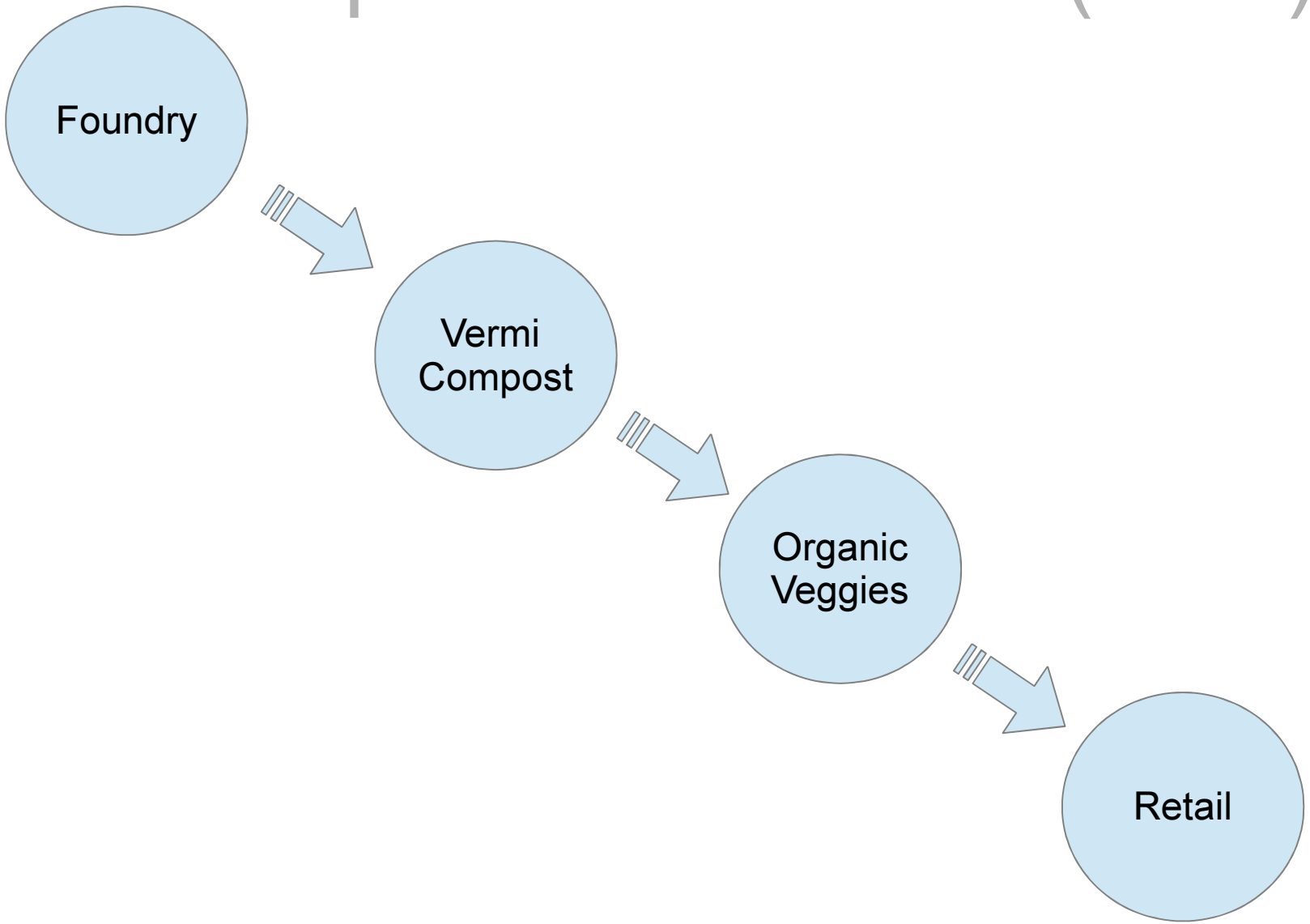
Diri – many (vs. Germany)

Originally,

“Diri man ini” (it's made here) – based on interview with Mr. Nonoy Moraca

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

Downstream Integrated Radicular Import-Substitution (DIRI)



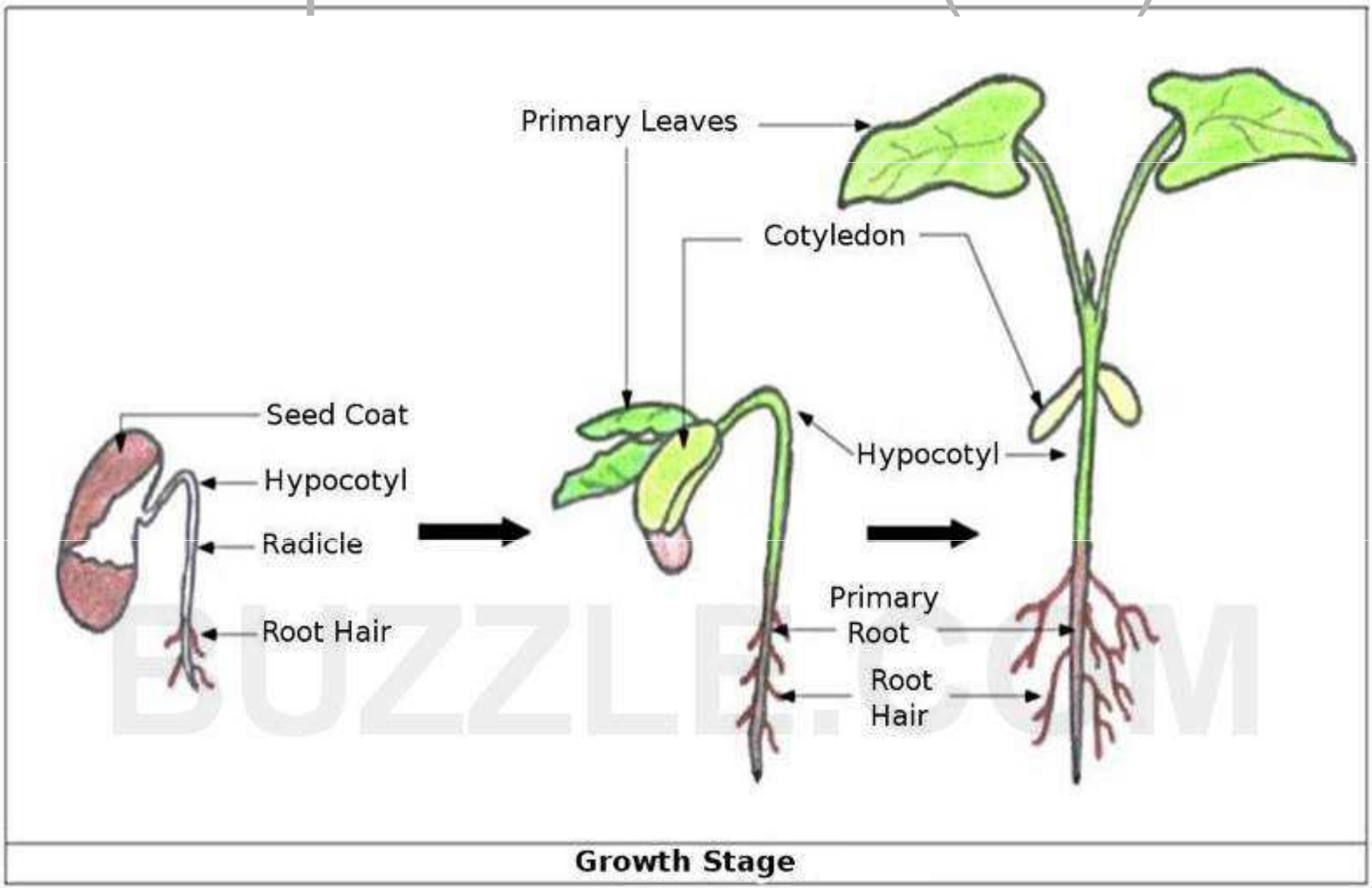
Manufacturing of Support Facilities for SA

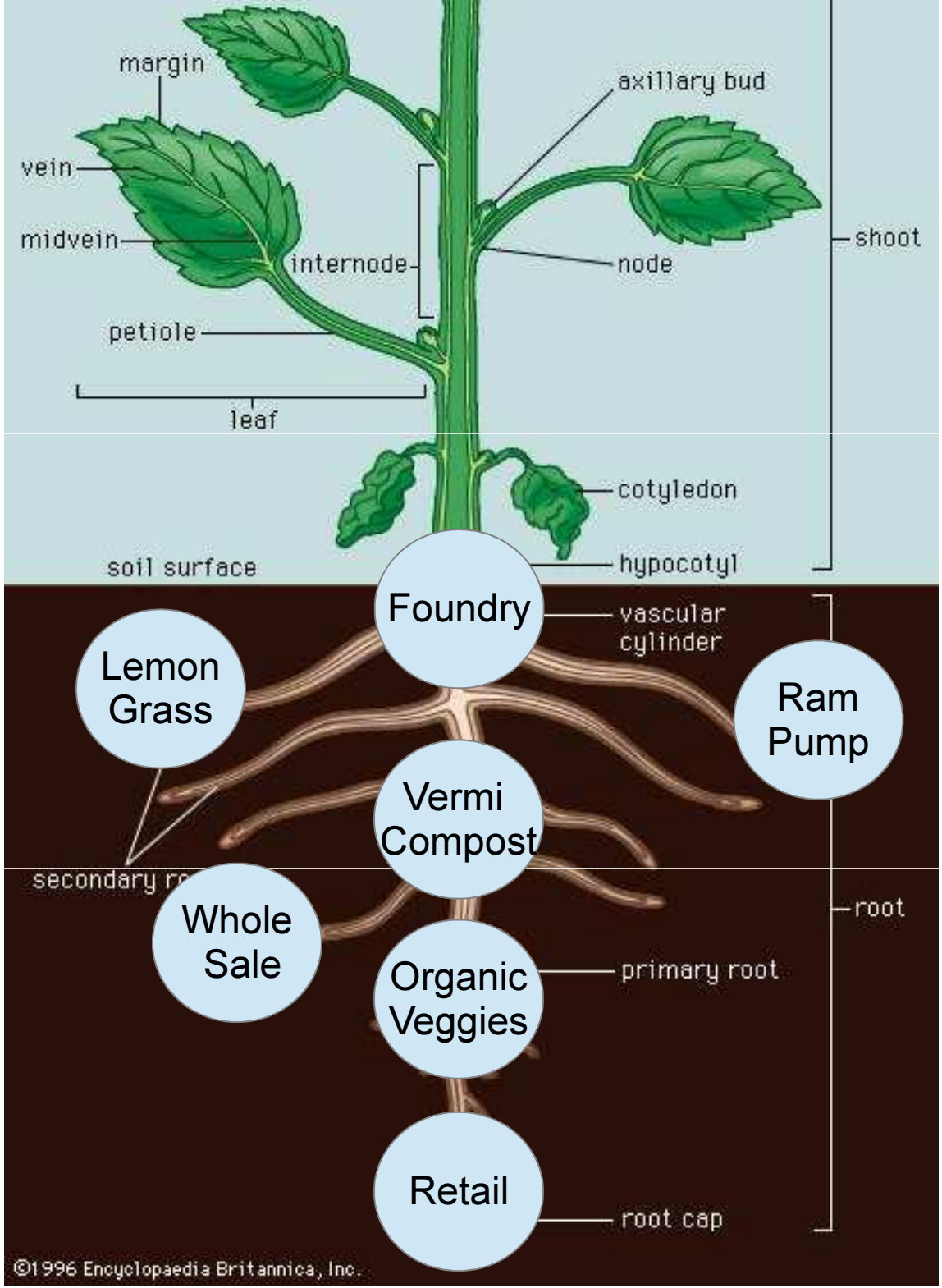
RU Foundry and Machine Shop Corporation

Production Area

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

Downstream Integrated Radicular Import-Substitution (DIRI)





Downstream Integrated **Radicular** Import-Substitution (DIRI)

Shredder Machine (Heavy Duty)

Hydraulic Ram Pump

Essential Oil Extractor

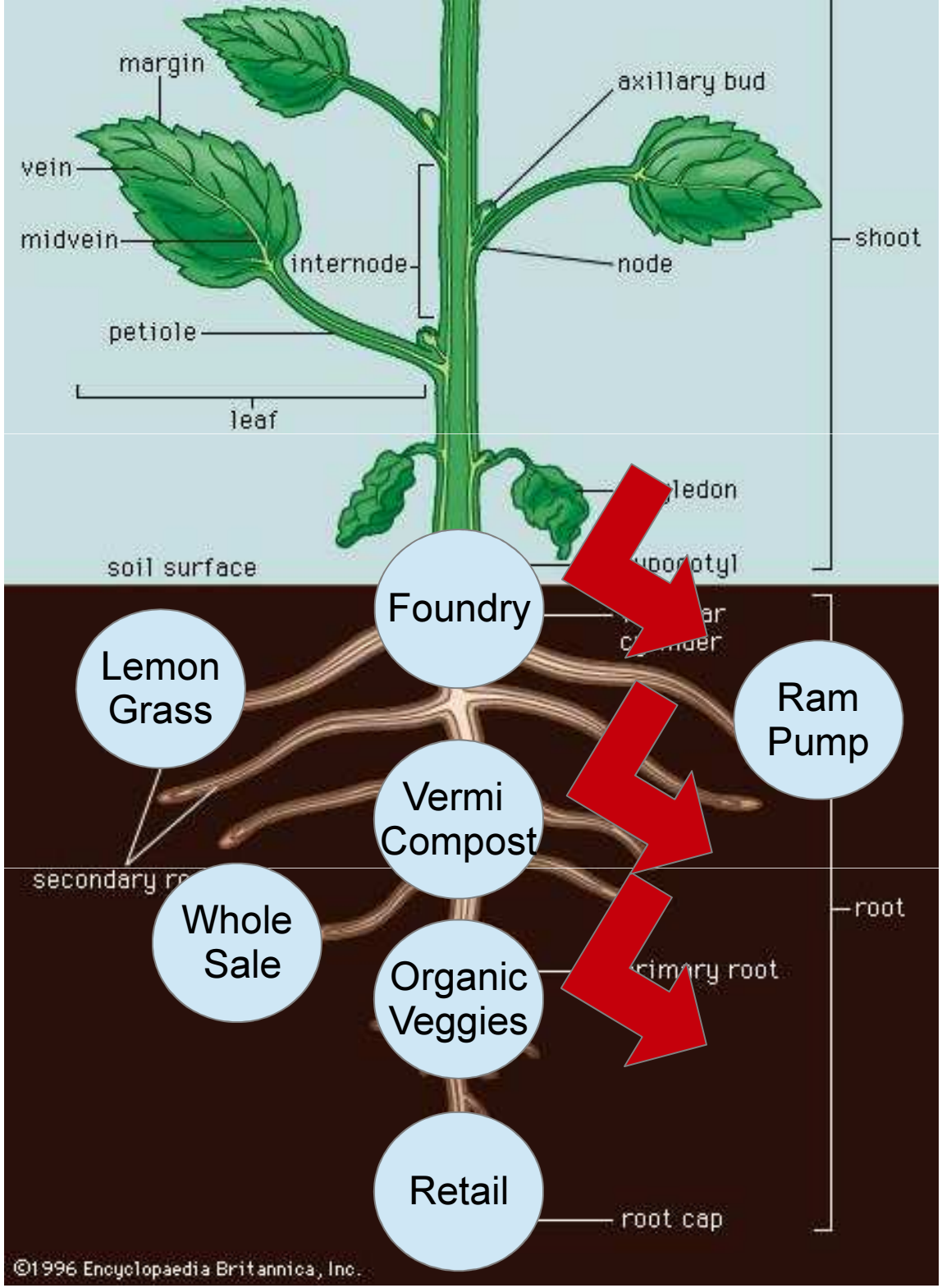
Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)

C. Hydraulic Ram Pump

A seventy two (72) year old woman and a boy fetch water everyday for drinking and households uses.

Source: MORACA and UY @ SGRA 15th Sustainable Shared Growth Seminar (Feb. 8, 2013)



Downstream Integrated Radicular Import-Substitution (DIRI)

Some Significance of the DIRI Model

Rethinking of Import-Substitution Strategy

1950's – 1960's: Import-Substitution Industrialization (ISI)

1970's – present: Export-Promotion Industrialization (EPI)

General View: ISI and EPI are independent

Flying Geese View (Japan's Development Model): ISI and EPI are dependent

Import Dependence → Import Substitution → Export Promotion → ...

Some Significance of the DIRI Model

The DIRI Model pushes Sustainable Agriculture

- 15th Sustainable Shared Growth Seminar: "Import-Substitution in Manufacturing for Sustainable Agriculture", Feb. 8, 2013, University of the Philippines http://www.aisf.or.jp/sgra-in-english/2013/02/seminar_15.html

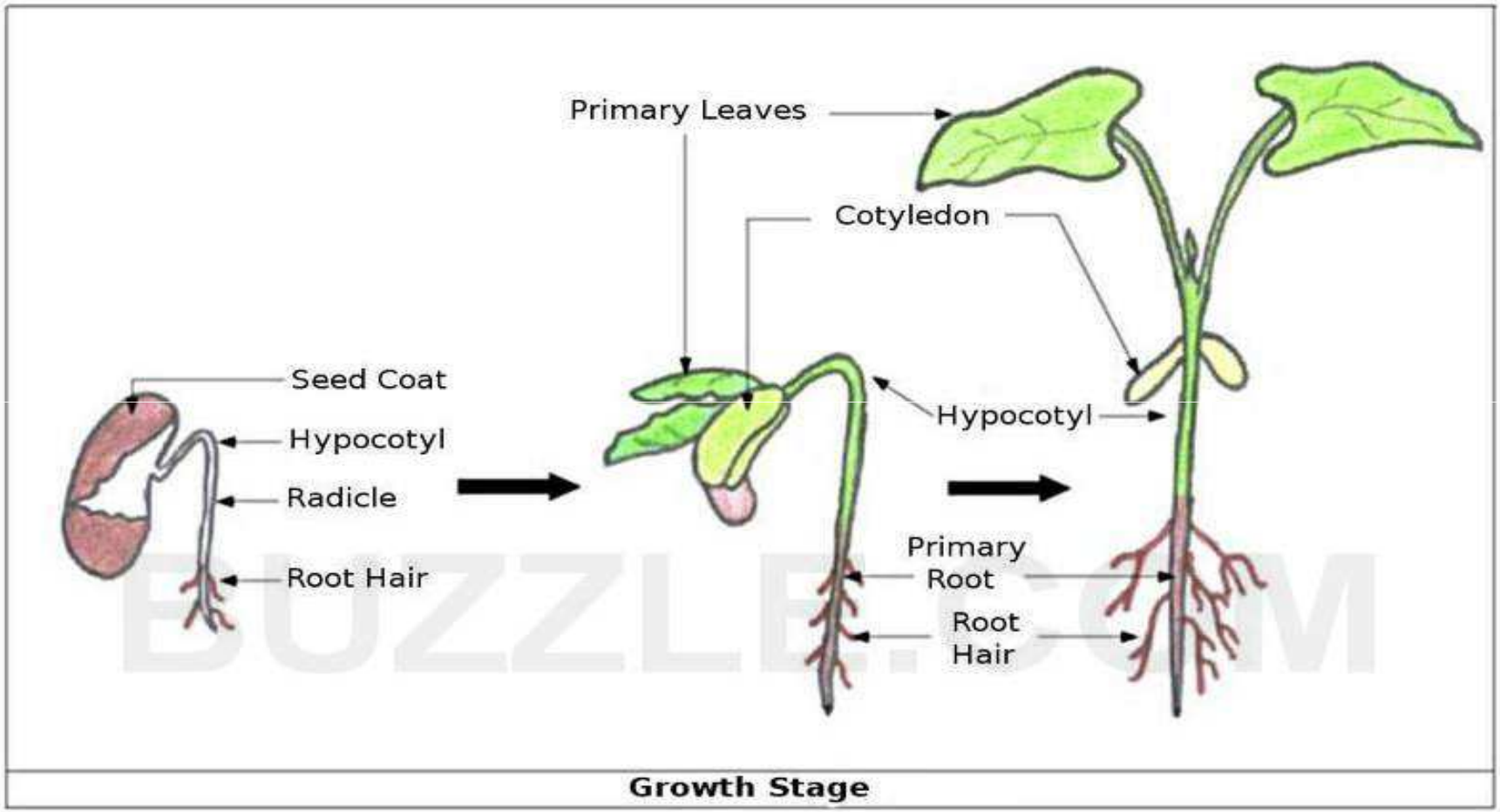
- Sustainable Agriculture is a good vehicle for delivering Sustainable Shared Growth (= Efficiency + Equity + Environment)

  = 効率 (Kouritsu) + 公平 (Kouhei) + 環境 (Kankyou)

  = Kahusayan + Katarungan + Kalikasan (KKK)

Some Significance of the DIRI Model

May lend itself well to Social Network Analysis → Sustainable Shared Growth



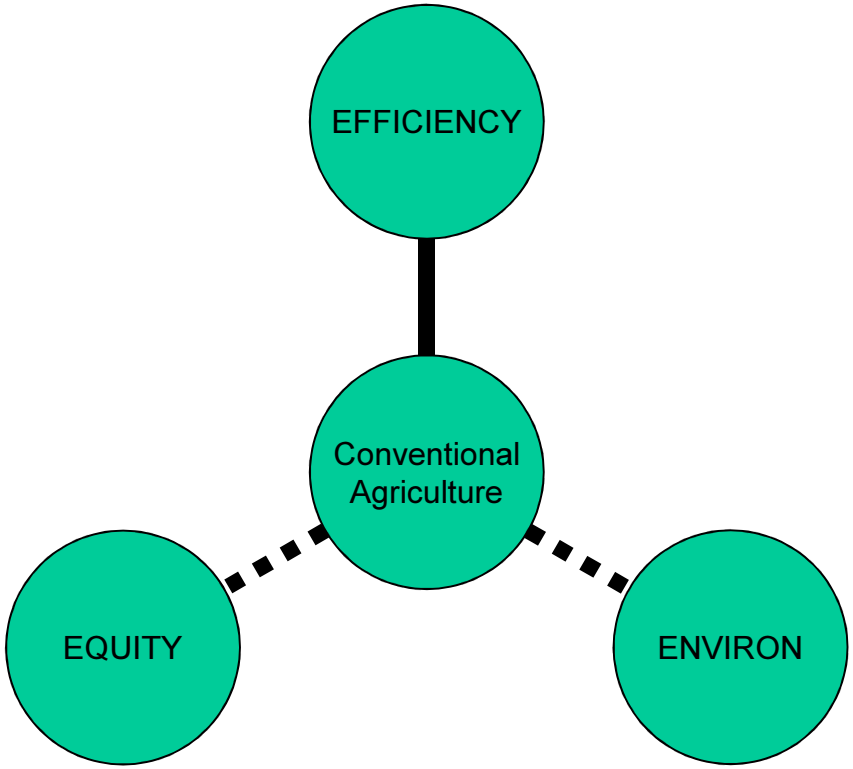
Conventional VS Sustainable Agriculture (Stylized Facts)

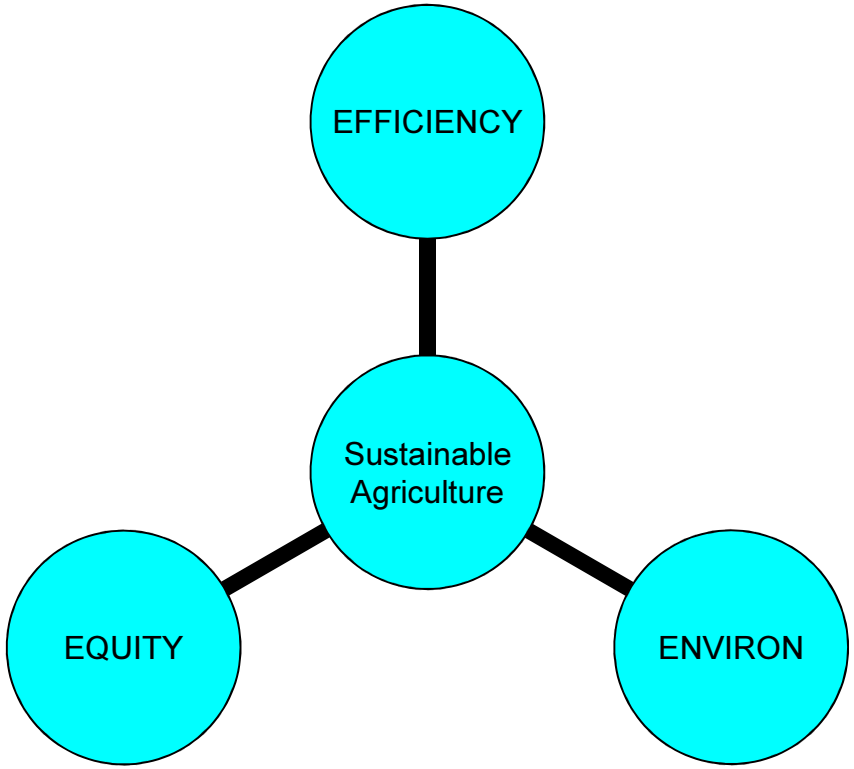
- High-Yield Seeds
- High dependence on external inputs
  - Irrigation
  - Agro-chemicals (e.g., herbicides, pesticides, inorganic fertilizers)
  - Tends to use more mechanization and fossil fuels
- Tends toward mono-culture
- Example: The Green Revolution

- Traditional/Indigenous or non-genetically modified seeds
- Low to zero dependence on external inputs
  - Harnessing instead of dominating nature
  - Tends to be labor-intensive
- Tends toward multi-culture
- Example: Organic Farming

While the adoption rate remains high, the overall adoption level is still low—only about 0.7 percent of all U.S. cropland and 0.5 percent of all U.S. pasture was certified organic in 2008

Conventional VS Sustainable





Comparison: Efficiency
Rodale Institute (2011)

Founded in 1947 by organic pioneer J.I. Rodale to study the link between healthy soil, healthy food and healthy people. He moved from NYC to rural Pennsylvania in the late 1930's where he was able to realize his keen personal interest in farming.

RODALE INSTITUTE

THE FARMING SYSTEMS TRIAL

Celebrating 30 years

OUR MISSION

Through organic leadership we improve the health and well-being of people and the planet.

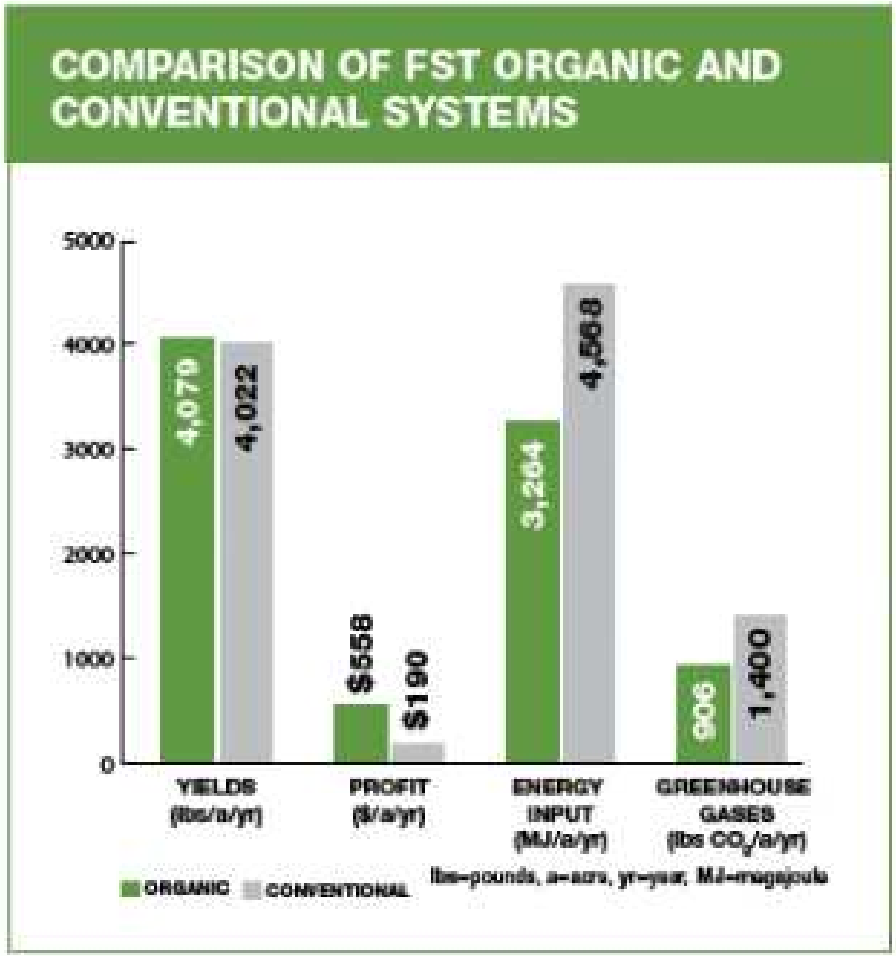
CORE VALUES

We empower each other to live our mission.
Our farm is a destination for inspiration.
Our research is a catalyst for change.
We are a clear voice for informed choice.

Comparison: Efficiency Rodale Institute (2011

FST FACTS

- Organic yields match conventional yields.
- Organic outperforms conventional in years of drought.
- Organic farming systems build rather than deplete soil organic matter, making it a more sustainable system.
- Organic farming uses 45% less energy and is more efficient.
- Conventional systems produce 40% more greenhouse gases.
- Organic farming systems are more profitable than conventional.

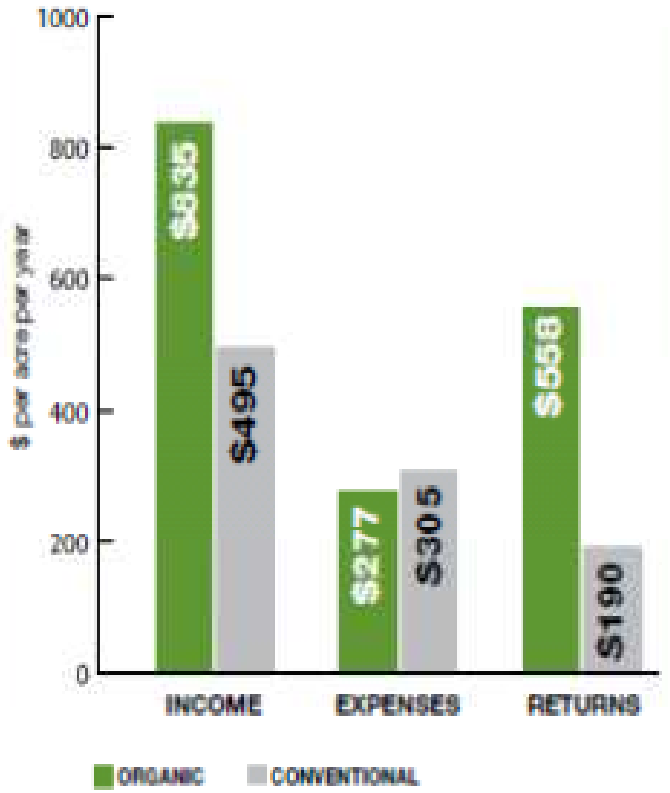


Comparison: Efficiency Rodale Institute (2011

FROM FST, we have found that:

- **The organic systems were nearly three times more profitable than the conventional systems.** The average net return for the organic systems was $558/acre/year versus just $190/acre/year for the conventional systems.
- **Even without a price premium, the organic systems are competitive with the conventional systems.** Marginally lower input costs make the organic systems economically competitive with the conventional system, even at conventional pricing.
- The most profitable grain crop was the organically grown wheat netting $835/acre/year.
- No-till conventional corn was the least profitable crop netting just $27/acre/year.

INCOME, EXPENSES & RETURNS IN FST ORGANIC AND CONVENTIONAL SYSTEMS



The economic analysis covers only the time period 2008-2010 to reflect data collected for the most recent cropping system comparisons.

Comparison: Equity

What is the effect of conventional agriculture on poverty reduction (→↑equity) ?

Let's use the Green Revolution to represent conventional agriculture adopted to developing countries

Green revolution is claimed to be scale-neutral

- It could be adopted by farmers irrespective of their farm size
- **T**he adoption of High-Yield Variety (HYVs) occurred quickly.
  - By 1970, about 20 percent of the wheat area and 30 percent of the rice area in developing countries were planted to HYVs
  - by 1990, the share had increased to about 70 percent for both crops.

Comparison: Equity

- Studies have shown mixed results
  - Early studies indicated that the GR was bad for small (poor) farmers
  - Recent studies cites some counter-examples
- International Food Policy Research Institute (IFPRI): GR also worked for small (poor) farmers, depending on their access to
  - Land, with secure ownership or tenancy rights
  - Efficient input, credit, and product markets
  - Policies that do not discriminate against small farms and landless laborers (e.g., no subsidies on mechanization, no scale biases in agricultural research and extension)

Comparison: Equity (Comment)

However, conditions cited by IFPRI do not tend to be scale-neutral but scale-biased (in favor of large farms), especially in (but not limited to) the case of developing countries

- Large farms tend to have more secure ownership
- Large farms tend to have easier access to credit, inputs, and product markets
- Large farms tend to have more political clout

Comparison: Equity (Comment)

Deninger and Squire (1998): LDCs 1960s to 1990s → land distribution is not optimal (WB)

- There is a strong negative relationship between initial inequality in the asset distribution and long-term growth
- Asset (land) distribution inequality reduces income growth for the poor, but not for the rich
- There is little support for inequality to improve as a country develops

Comparison: Equity (Comment)

Gupta, et. al. (1998): LDCs 1980s-1997 → corruption (ability of powerful people to influence government policies) is not good for improving income inequality and poverty (IMF)

- Reduction in
  - economic growth
  - progressivity of the tax system
- Perpetuates
  - an unequal distribution of asset ownership
  - an unequal access to education

Comparison: Environment Rodale Institute (2011)

- **Soil health in the organic systems has increased over time while the conventional systems remain essentially unchanged.** One measure of soil health is the amount of carbon contained in the soil. Carbon performs many crucial functions such as acting as a reservoir of plant nutrients, binding soil particles together, maintaining soil temperature, providing a food source for microbes, binding heavy metals and pesticides, influencing water holding capacity and aeration, and more. More carbon is better!

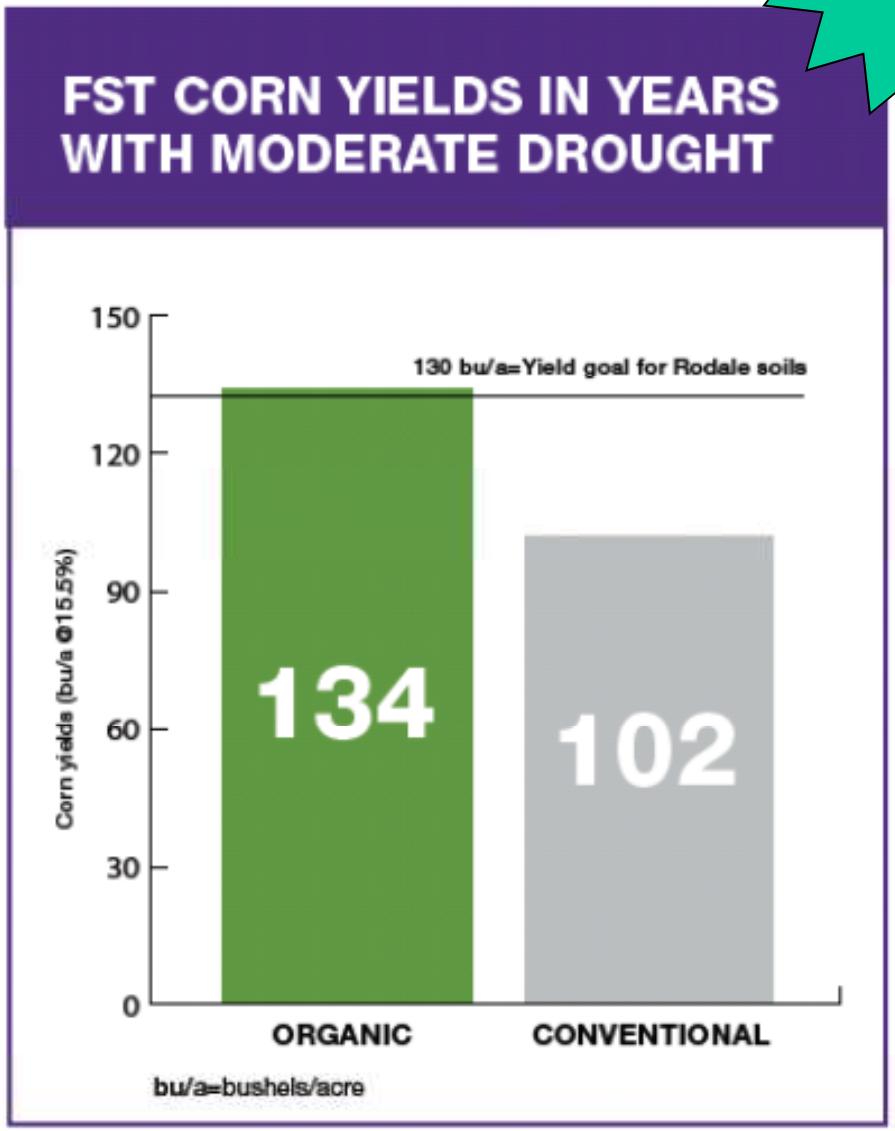
Soils in the organic and conventional plots are very different in appearance due to the increase in soil organic matter in the organically managed soils. The organically managed soil is darker and aggregates are more visible compared to the conventionally managed soil.

Comparison: Environment Rodale Institute (2011)

BONUS

- **Organic corn yields were 31% higher than conventional in years of drought.** These drought yields are remarkable when compared to genetically engineered "drought tolerant" varieties which saw increases of only 6.7% to 13.3% over conventional (non-drought resistant) varieties.

- **Corn and soybean crops in the organic systems tolerated much higher levels of weed competition than their conventional counterparts, while producing equivalent yields.** This is especially significant given the rise of herbicide-resistant weeds in conventional systems, and speaks to the increased health and productivity of the organic soil (supporting both weeds and crop yields).



Comparison: Environment
Rodale Institute (2011)

BONUS

GENETICALLY MODIFIED CROPS

According to the Department of Agriculture, 94% of all soybeans and 72% of all corn currently grown in the United States are genetically modified to be herbicide-tolerant or express pesticides within the crop. So, in 2008, genetically modified (GM) corn and soybeans were introduced to FST to better represent agriculture in America. GM varieties were incorporated into all the conventional plots.

We incorporated the GM crops to reflect current American agriculture, rather than to specifically study their performance. Our data only encompasses three years, but the research being done in the community at large highlights some of the clear weaknesses of GM crops:

Comparison: Environment Rodale Institute (2011)

BONUS

- **Farmers who cultivated GM varieties earned less money** over a 14-year period than those who continued to grow non-GM crops according to a study from the University of Minnesota.

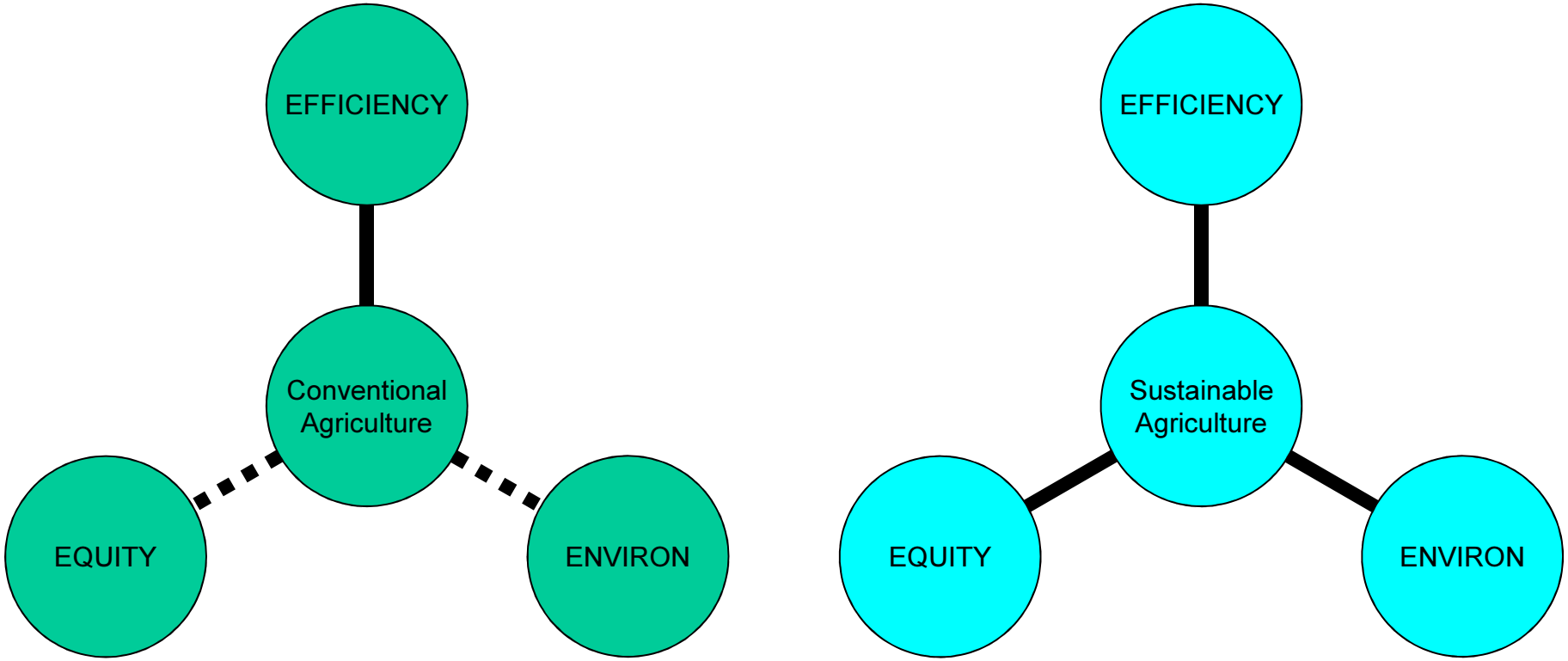
- **Traditional plant breeding and farming methods have increased yields of major grain crops three to four times more than GM varieties** despite huge investments of public and private dollars in biotech research.

- **There are 197 species of herbicide-resistant weeds, many of which can be linked directly back to GM crops**, and the list keeps growing.

Pesticides commonly used in agriculture have been found in drinking water, sometimes at levels above regulatory thresholds.

- **GM crops have led to an explosion in herbicide-use** as resistant crops continue to emerge. In particular, the EPA approved a 20-fold increase in how much glyphosate (Roundup®) residue is allowed in our food in response to escalating concentrations.

Conventional VS Sustainable



DESPITE BEING E-CUBE, WHY IS SUSTAINABLE AGRICULTURE NOT PREVALENT?

Let us work together towards sustainable shared growth for the Philippines!