

World Food Problems

September 9, 2009

<http://www.apec.umn.edu/faculty/kolson/apec4103.html>

The World's Population

<u>Population</u>	<u>Year</u>	<u>Years to add a billion</u>
1 billion	~1804	-
2 billion	1927	123
3 billion	1960	33
4 billion	1974	14
5 billion	1987	13
6 billion	1999	12

6.7 Billion people

>0.9 Billion people malnourished

1.1 Billion people obese or overweight

United States' Population

0.3 Billion people (in Oct. 2006)

0.2 Billion people (in 1967)

0.1 Billion people (in 1915)

One person every 14 seconds.

(a birth every 8, a death every 12 & an immigrant every 31)

St. Paul Pioneer Press article, 13 Jan. 2006

Population Control

War

Starvation

Disease

Pests

Society

World Population

188 births / minute / day
100,000,000 births per year or 1 Billion in a decade
“In 20 year one-half the world’s population will live in mega-cities.”

World Population Density

32 Billion acres
16 Billion acres of ice
8 Billion acres of grazing land
8 Billion acres of potentially arable land
(of which 4 Billion is currently used)

‘~ 1 acre of arable land per person today.’

United States = 9 total acres / person
Bangladesh = 0.3 total acres / person

The Major Problem

Is not how can we produce the food,
but
how to distribute the food we produce.

More food by:

1. More land in production
2. More production per acre

1998 Video: World Agriculture & Population: Seeking a Balance

Characteristics of a Global Village

388 Asians
165 Africans
161 Indians
92 Europeans
84 Latin Americans
55 Russians
51 North Americans
4 Australian/New Zealanders

1000 (Increasing by 18 people / year)

330 are children
60 are over 65 years of age

143 from N. America and Europe (75% of income)
353 labor pool (Asia, receive 2% of income)

500 subsistence farmers on small plots
700 are illiterate
500 Suffer from some form of malnutrition

Haves

25% of the population uses 40% of the arable land
and 83% of the fertilizer to producer 8X greater yields.

Have nots

75% of the population uses 60% of the arable land
and 17% of the fertilizer to producer only enough food for their families.

1998 Video: World Agriculture & Population: Seeking a Balance

Google: Global Village of 1000 People

Where Food is Produced

Percent Area of World

17.6	Southeast Asia
15.2	China
14.2	North America
13.1	Europe
11.1	Russia
10.4	Central & South America
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81.6	Total for the 'Big 6'
18.4	Remainder of the world

Major Factors Limiting Food Production

Effective climate

Land – physical & chemical properties, terrain, soil type

Land – fertility, organic matter

Soil stability – erosion status

Moisture management (+ or -)

Pests – weeds, diseases, insects

Access to appropriate technology

Economic conditions

Social infrastructure – education, land tenure, customs

1998 Video: World Agriculture & Population: Seeking a Balance

Biological Diversity for Food: a largely untapped resource

~ 250,000 plant species are known:

more than 30,000 are edible
about 7,000 have been used primarily as food
some 130 are cultivated today
9 provide more than 75% of human food
only 3 provide more than 50% of human food.

Plants Utilized by Humans:

Number of species of plants known	381,000
Number of species utilized by humans	1,000-3000
Number of potentially useful species	25 to 30%
Number of species important to world trade	300
Number used for bulk of world food	15
Number important to U.S. food	36
Number important in diet of average country	11
Number important of food deficit countries	6

Twenty most important Crops (according to area occupied):

<u>Name</u>	<u>Part</u>	<u>Name</u>	<u>Part</u>
Wheat	cereal/grass	White potato	tuber
Rice	cereal/grass	Peanut	seed-legume
Maize	cereal/grass	Rye	cereal/grass
Barley	cereal/grass	Sweet potato	tuber
Pearl millet	cereal/grass	Sugar cane	stem/grass
Sorghum	cereal/grass	Cassava	tuber
Soybean	seed-legume	Pea	seed-legume
Cotton	seed	Chick pea	seed-legume
Oats	cereal/grass	Grape	fruit
Field bean	seed-legume	Canola	seed

Sources of Calories, Protein, Vitamins & Minerals

Cereal grains provide humans 60% of calories and 50% of protein:

Rice	Oats
Wheat	Barley
Maize	Rye

Legumes provide humans with 20% of their protein:

Soybean	Cowpea
Field bean	Chickpea
Pea	Pigeonpea

Food animals provide 20% of protein (5% from fish).

Tuber & root crops along with fruits, nuts and vegetables provide the balance of calories, protein, vitamins & minerals:

Potato	Cassava
Sweet Potato	Cocoyams

Source: Wittwer, S.H. 1998. *The Changing Global Environment and World Crop Production*. *Journal of Crop Production*. 1:291-299.

Regional Variation in Percent of Total Calories by Source

<u>U.S.A.</u>	<u>South America</u>	<u>Central America</u>
32% Animal	18% Animal	32% Maize
20% Oils	18% Sugar	12% Animal
16% Sugar	14% Starch	12% Wheat
14% Wheat	14% Wheat	9% Oils

<u>South Asia</u>	<u>Middle East/ North Africa</u>
33% Rice	46% Wheat/Barley
16% Sorghum	20% Other cereals
10% Legumes	10% Oils

<u>West Africa</u>	<u>Equatorial Africa</u>	<u>East Africa</u>
46% Sorghum	54% Starch	28% Maize
14% Millet	11% Legumes	18% Cereals
10% Legumes	10% Maize	12% Sorghum
		10% Starch

The class web page:

<http://www.apec.umn.edu/faculty/kolson/apec4103.html>

Leathers and Foster's book web page:

http://www.arec.umd.edu/People/faculty/Leathers_Howard/index.cfm

Statistics clock:

<http://www.poodwaddle.com/worldclock.swf>

Home 1h33min (by Europa)

<http://www.youtube.com/watch?v=jqxENMKaeCU>

Goggle search of 'world hunger' in video gives lots of hits.

Sorry, these links below don't go directly to the intended video...

World Hunger Udesh Cooray 5:00 min

http://video.google.com/videosearch?client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4#client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4&start=0

World Hunger Awareness 1:51 min

http://video.google.com/videosearch?client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4#client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4&start=30

Daniel Quinn on Facts of World Hunger

http://video.google.com/videosearch?client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4#client=firefox-a&rls=org.mozilla:en-US:official&channel=s&hl=en&source=hp&q=world+hunger&um=1&ie=UTF-8&ei=4MimSrDuCtCinQev8JS2Bw&sa=X&oi=video_result_group&ct=title&resnum=4&start=20