WHERE DEMOGRAPHICS WILL TAKE THE FOOD SYSTEM
PACIFIC ECONOMIC COOPERATION COUNCIL

PACIFIC FOOD SYSTEM OUTLOOK 2003-2004

WHERE DEMOGRAPHICS WILL TAKE THE FOOD SYSTEM
The Pacific Food System Outlook extends thanks to its sponsors. For information about the activities of our sponsors see page 28.
This report focuses on the role of demographic change in the region's food system. The population of the member-countries of the Pacific Economic Cooperation Council (PECC) is becoming more urban, increasing in number and getting older. The region's food system must deliver food to an additional 400 million people by 2020. With the over-65 population almost doubling to 370 million in 2020 from 200 million in 2000, food suppliers must adjust to changing food demand patterns and food service requirements. For example, Japan is the number one net importer of food and agricultural products in the world. Its rapidly aging population will begin to decline in 2007, resulting in lower total demand for food but increased demand for different kinds of food.

By 2005 more people in the region will live in urban areas than in rural areas, with growth in the urban population more than double overall population growth. The region will face new challenges in supplying food over greater distances to more densely populated urban areas, especially in the developing economies. China is a case in point, with its urban population projected to grow by a staggering 300 million people between now and 2020. Infrastructure improvements will be critical to providing the needed food.

Participants in the Pacific Food System Outlook Project also addressed the general food outlook for 2003-04. The region's food system is confronted by geopolitical uncertainties arising from the war in Iraq and the Severe Acute Respiratory Syndrome (SARS). While economic growth in the region is expected to be roughly the same in 2003 as in 2002, expectations at the beginning of the year were more bullish than now. In contrast, the outlook for the U.S. economy is quite favorable. Low inflation and interest rates, significant tax cuts, stepped-up government spending, and high productivity growth are fueling strong consumer confidence and industry profits. The U.S. economy will act as the engine of growth for the region and its food system.

Agricultural commodity prices are showing some modest upward trend now, due both to greater imports and weather-induced production shortfalls. In Australia, for example, last season's grain yields were off more than 50 percent. Detailed food system outlook profiles for each PECC economy will

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PACIFIC FOOD SYSTEM OUTLOOK 2003–2004
The population in member economies of the Pacific Economic Coopera-
tion Council (PECC) is projected to increase by more than 400 million people in
the next two decades, a 16-percent increase in the number of people to feed. This increase is equivalent
to the combined populations of both Japan and the United States. While economic growth and
prices are closely-monitored drivers of food demand, demographic
distribution of human populations; and the changes that occur in these phenomena through the
process of fertility, mortality and migration. Making connections between demographic change and
food demand and supply go back 200 years to the days of Malthus when he asserted “the power of
population is infinitely greater than the power in the earth to produce subsistence for man.” His
pessimistic view about the earth’s capacity to produce food was tempered later in the second edi-

Rapid Urban Population Growth
The most significant demographic change in the PECC region in the
next two decades will be the rapid growth of urban populations.
Some urban areas are already dis-
tressing large and confronted by problems of poverty, pollution,
and congestion. Urban growth will test the efficiency and capacity
of the region’s food system to deliver a continuous flow of safe, reasonably priced, fresh and
processed foods.

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system to deliver a continuous flow of safe, reasonably priced, fresh and
processed foods.

changes — urbanization, growth in populations and changes in the
age structure of populations — are subject to less scrutiny, but
may have more profound long-
term implications for the region’s
food system.
This report examines demo-
graphic changes as projected
through 2020, assessing demand
and supply implications for the
region’s food system. The informa-
tion is based on individual
economy reports from PECC
members and discussions at a
three-day conference in
Honolulu, Hawaii, May 20-22,
2003. Population data are drawn
from the United Nations and
from agencies responsible for
tracking these data in member
economies.
Demography is the study of
the size, composition and spatial
tion of “An Essay on the Principle
of Populations,” when he recog-
nized the important future role of
“physical discovery” (Smil, pp.
xxvii-xxviii), or technological
change in raising food supply.
Indeed, human innovation has
steadily increased the “power in
the earth” to produce food. Thus,
at least for the intermediate term,
population growth and other
demographic changes are more
likely to define food markets than
supply constraints.
This report addresses three
major areas of concern for the
agri-food system in the region:
■ Greater population concen-
trations in urban areas;
■ Variability in the size and
growth of populations within
the region; and
■ Influences of aging popula-
tions on food demand.
PECC’s urban population is
projected to grow by more than
590 million people between 2000
and 2020, an increase of about 45
percent, compared to the expected
overall population growth of only
16 percent. After 2005, the
region’s urban population will sur-
pass the rural population for the
first time (Figure 1). This rapid
growth is explained by higher
birth rates, the migration of peo-
ple from rural to urban areas, and
immigration.
Urban growth will be uneven
throughout the region (Figure 2).
Definitions of “urban” vary across
the region; some urbanization
may result solely from changes
over time in the definition of
what constitutes an urban area.
Urban growth is expected to be
the most rapid in China and
Southeast Asia; at intermediate
Figure 1 PECC’s Urban Population Will Soon Surpass its Rural Population

Source: UN

Figure 2 Distribution of Population Growth Uneven in PECC Region

Source: FAOSTAT
WHERE DEMOGRAPHICS WILL TAKE THE FOOD SYSTEM

BOX 1: RURAL TO URBAN MIGRATION AND URBANIZATION IN CHINA

China's urban population is projected to increase from about 450 million in 2000 to 750 million in 2020, an increase of 300 million people. By 2015, China's urban population will surpass its rural population for the first time (Figure 5). Half of this increase will be “natural.” The other half will be through rural-to-urban migration. While the challenges posed by this demographic shift are staggering, this movement of people has already partially been accomplished as China’s “floating” migrant population—estimated between 60 and 120 million—has one foot in the furrow and one foot in the city.1

China’s urbanization will have profound impacts on the economy. Overall agri-food productivity in China will rise as labor exits agriculture. Furthermore, migrants help to ease credit constraints in rural areas through remittances and by facilitating the flow of information, technological change, and investment back to commercial undertakings in rural areas. A key question is whether such productivity gains in China’s agriculture can keep pace with the increases in food demand associated with greater urbanization. It is clear that migration will lead to greater specialization in the Chinese economy, more efficient allocation of resources, and increased rural-urban trade.

In the past two decades, China has relaxed restrictions designed to control or limit rural-urban migration. The household registration (or hukou) system and the collective approach to rural land tenure historically hampered rural to urban migration. These systems underwent reform after the Household Responsibility System (HRS) was introduced between 1978 and 1984. China’s government has become progressively more open in allowing individuals with rural registrations to reside in urban areas. Some speculate that the hukou system may be abolished within the next decade.

The HRS, along with the introduction of market-type incentives, spurred productivity gains in the agri-food sector in the early to mid-1980s. Initial productivity gains freed rural labor and resources for other economic activities, giving rise to a boom in local township and village enterprises (TVEs) in the late 1980s and 1990s. China’s official statistics indicate that the number of rural workers with non-farm employment in local rural enterprises doubled from 67 million in 1985 to 127 million in 1999.

The rural-urban shift has had a dramatic impact on food consumption patterns. On a per capita basis, China’s rural citizens consume almost three times as much grain per capita as urban residents. However, urban residents consume more of almost everything else. This includes livestock, poultry, and fishery products, which contribute to an overall increase in grain demand. Greater access to refrigeration also affects consumption choices, allowing for the purchase of greater volumes of convenience foods, frozen foods, and perishable goods (Gale).

While urban populations are increasing, rural populations are expected to shrink in practically all the region’s economies. The exceptions are Vietnam, Malaysia, Ecuador, Brunei, Thailand and Mexico. South Korea will experience a sizable decline of around 35 percent; Japan and Chile will register declines of more than 15 percent. The largest absolute decline in rural population will occur in China, where about 145 million people are expected to migrate from rural areas to urban centers between 2000 and 2020.

The region’s rapid rate of urbanization is driven by technological, social, cultural and economic changes. Improved efficiencies in rural and farm enterprises and greater opportunities for gainful employment in cities provide the underpinning of this shift. Urban development is an inevitable consequence of agricultural surpluses, economic specialization, more efficient allocation of resources, and higher incomes.

Diets in urban areas are distinct from those in rural areas. Much of this has to do with higher incomes and the predictable substitution of animal products, fruits, and vegetables for more traditional foods, including staple foods in urban diets. However, this may reflect official definitions rather than accurately represent China’s current circumstances. Once China’s migrant population and its relative dependency on both urban and rural income sources is considered, the rural-urban population split is likely to be closer to 50:50.

1 Official statistics still classify 60 to 70 percent of China’s population as “rural” and 30 to 40 percent as “urban.” However, this may reflect official definitions rather than accurately represent China’s current circumstances. Once China’s migrant population and its relative dependency on both urban and rural income sources is considered, the rural-urban population split is likely to be closer to 50:50.
cereals and roots and tubers (Figure 3). Urban residents in the Philippines, for example, eat twice as much “prestige foods” — meat, poultry, eggs, and dairy products — as do their rural counterparts who eat more rice, corn, roots and tubers, and vegetables. Diets in urban areas are more diverse, both in terms of the kinds of foods consumed and their origins. Urban dwellers tend to eat away from home more frequently, and have a greater preference for convenience foods. In developing and middle-income economies, access to superior infrastructure and reliable electricity facilitates the consumption of perishable commodities that have sometimes traveled great distances.

Work and lifestyles in urban areas tend to be more sedentary than those in rural areas, leading to lower per capita energy expenditure and lower per capita caloric requirements. Higher incomes, lower food prices, and the urban consumer’s propensity to consume more food than justified by one’s energy expenditure tend to offset this.

People concentrated in urban areas are dependent on a vast and complex food system, with supply chains spanning great distances, including overseas. This complex system provides greater opportunities for mishandling and spoilage. In addition to raising farm-level productivity, improving food system efficiency beyond the farm gate is necessary to increase available food supplies.

The competing urban claim on water and other resources important to food production raises farm sector costs, encouraging producers to lower costs and increase efficiency. Urban encroachment on prime agricultural land may affect an economy’s agricultural productivity by forcing producers onto more marginal lands. As in the case of Chinese Taipei, a government may promote greater efficiency by encouraging farmers to enlarge operations, providing assistance for older farmers to retire with dignity, and providing training for rural youth contemplating farming as an occupation.

Marketing food products in the Asia-Pacific region will increasingly focus on densely populated urban centers, such as the Hong Kong-Shenzen-Pearl River Delta area, Shanghai, Jakarta, Bangkok, Manila, Santiago-Valparaiso, and Lima-Callao. Many of these urban areas are coastal and have modern port facilities, making them more accessible to foreign suppliers (Figure 4). In some instances, foreign suppliers are more competitive in these coastal urban markets.
than inland producers who confront inadequate supply-chain infrastructure and cost-raising policies. Here are two examples:

- High-quality grapes are produced in Xinjiang (China’s northwest), but shipping them the 2000 miles to Guangzhou, China’s biggest fruit market, is a difficult challenge. It can take longer to get Xinjiang’s grapes to Guangzhou than the two weeks it takes for California grapes to arrive from more than three times the distance. China suffers a disadvantage because of inadequate refrigeration and transportation services, road tolls charged by local governments, and the lack of advanced technology to grade, clean and wax the fruit (John Pomfret and Philip P. Pan, The Washington Post, Nov. 11, 2001).

- In the Philippines, the cost of moving corn from the growing areas of Mindanao to the poultry growers located near metropolitan Manila is estimated at times to be higher than the cost of importing corn from Bangkok, Thailand.

The region’s population is projected to increase by more than 400 million people in the next two decades. This increase is equivalent to the current population of Japan and the United States.

Population growth in the region will not be evenly distributed (Figure 8). At around 160 million people, the largest absolute increase in population by 2020 will occur in China, followed by Indonesia and the United States at about 60 million and 50 million, respectively. Starting in 2007, Japan’s population will actually begin to decline. The Russian Federation’s population is already in decline.

Despite a declining rate of growth in China, the absolute increase in its population relative to other economies in the region will remain large for several decades. Around 2030, China’s population will begin to shrink as will its East Asian neighbors — Korea in 2027, Chinese Taipei in 2029, and Hong Kong, China, in 2025. Surprisingly, the United States will grow at a similar rate as some developing economies because of immigration and the high fertility rate of recent immigrants. In percentage terms, the largest population increases will occur in Singapore, Brunei, Malaysia, the Philippines, Ecuador, Peru, and Colombia, with each of these economies’ populations expected to increase by more than 30 percent between 2000 and 2020.

While population growth in the PECC region is slower than the rest of the world, immigration is relatively more important. In 2000, some 760,000 more people entered the region than left; a number that is still small relative to the annual 24.5 million natural increase in the region’s population. Within the region, however, there is significant transmigration. The most important destinations for migrants are the economies with higher per capita income: Singapore, Hong Kong (China), Canada, New Zealand, Australia, Brunei, the United States, and Russia. Net migration to the United States alone exceeds one million people annually. Japan doesn’t fit into this category because of strict immigration policies that explain its homogeneous population. The middle-income East Asian economies of Korea and Chinese Taipei follow a similar pattern. As one would expect, emigration is most common in the lower-income economies of the Philippines, Peru, Ecuador, Vietnam, Colombia, China,
**Figure 4** Largest Urban Agglomerations in PECC

Agglomerations include a central city and neighboring communities connected by continuous built-up areas and many commuters. Some agglomerations have more than one central city. Agglomerations here are those with more than 4 million population.

**Figure 5** China's Urban Population Will Surpass its Rural Population by 2015


Source: FAOSTAT
Mexico and Indonesia, with net emigration from the latter three equaling 200,000 to 300,000 annually in recent years.

The Philippines also has significant emigration, with a total of 7.4 million overseas workers. Although they are generally better educated and trained people whose emigration represents a drain on the economy, their remittances back to the economy are significant.

Ethnic changes in Southeast Asia and Latin America result less from migration and more from the intermarrying of native groups within an economy or region. For example, 60 percent of Mexico’s population is Mestizo, the result of a mixing of white and native indigenous populations (Table 2). Another important ethnic phenomenon in the region is the role of the Chinese Diaspora: about 30 to 40 million Chinese who live outside of China, the majority in the PECC region. The Diaspora’s contribution to population growth in the region is minor, but its influence on business in a number of economies and its investment role in China is disproportionate to its numbers.

Population growth will obviously place demands on the Pacific agri-food system; more people means increased food consumption. But the changing rates and distribution of growth also have implications. Japan’s declining population implies lower levels of food demand in this affluent nation, which is a leading net importer of food and agricultural products. Russia’s declining population, when combined with its social and economic restructuring, could result in major changes in its role in international agri-food markets. More rapid population

Table 1  
Demographic Indicators for the

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NA = not available
* Ratio of young (0-14 years) and elderly (65 or over) to working population (15-64 years)
Source: UN (medium fertility scenario), FAOSTAT, Pacific Food System Outlook economy profiles
## PECC Region

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and economic growth in developing and middle-income economies will increase their influence in the Pacific food system, altering production, consumption and trade patterns.

Immigration affects food demand in two ways. First, it immediately raises aggregate demand in the receiving economy. Since immigrants often have a higher fertility rate than native residents, they can boost population growth in subsequent years. In the United States, for example, immigration plus the higher fertility of recent immigrants accounted for about 60 percent of the population growth in the 1990s. Second, the rise in the immigrant share of a population can affect an economy’s food preferences. This is observed in Australia (with a rising Asian share of its population), Canada (Asian), and the United States (Hispanic and Asian). These changes may be short-term in nature, with ethnic dietary differences becoming less pronounced over time, as immigrant progeny adopt the food preferences of their new country, and as the new country’s cuisine is, in turn, affected by the influence of successive waves of new immigrants.

A Graying Population: Declining Food Demand and a Tax on the Economy

Between 2000 and 2020, average life expectancy in the PECC region is expected to rise from 72 to 77 years and the median age from 30 to 36 years. The over-65 population will increase from 200 million in 2000 to 370 million in 2020. Virtually all the economies in the region have made the transition from high to low birth and death rates, leading to a projected 8 percent decline in the number of young people between 2000 and 2020, a modest 17 percent rise in the share of the working population, and a very rapid rise of almost 80 percent in the number of elderly. Japan is the most rapidly aging economy in the region (Box 2). This aging phenomenon is not unique to the PECC region, but is happening more rapidly here and in Western Europe than in the rest of the world.

The oldest PECC populations are in East Asia and in the developed economies of Australia, Canada, New Zealand and the United States. In these economies the demographic transition — the decline in the fertility and mortality rates — occurred several decades ago, driven by income growth, medical breakthroughs, healthcare investments, and public policy.
Figure 7: Annual Additions to the PECC Population Declining

![Graph showing annual additions to the PECC population declining over time from 1950 to 2050.](source: UN)

Figure 8: Population Growth Uneven, 2020 Compared With 2000

The most rapidly growing populations are projected for low and middle-income economies. High growth rates in high-income Singapore and Brunei are explained by small populations and high rates of immigration.

![Graph showing population growth changes from 2000 to 2020. The most rapidly growing populations are projected for low and middle-income economies. High growth rates in high-income Singapore and Brunei are explained by small populations and high rates of immigration.](source: http://www.census.gov/cgi-bin/ipc/idbsprd)
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<td>Muslim (1.3%)</td>
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Pacific Food System Outlook profiles
(e.g., in the 1970s, China’s family planning policies, including later marriage, greater spacing between children and fewer children [Goldstein, p. 7]). Increased female labor market participation in these economies has also contributed to lower birthrates. On the other hand, PECC member economies with lower per capita income have more youthful populations; their transition took place more recently and in some cases is not complete. The advantage of slower population growth is fewer dependent young people and a relatively larger productive segment of the population. The declining dependency of young people, however, will eventually shift to greater dependency on older people, as the working segment ages, becomes less productive and retires.

The changing age structure of the region’s population has direct and indirect effects on food demand. One direct effect is lower food demand. All across the region populations are getting older, with women outliving men. With an aging population, food demand declines as activity levels and caloric needs decline. Women’s caloric needs are lower than men’s because of higher body fat levels (Figure 9).

A second direct effect is change in dietary composition and the nature of food service. The effects of population aging on consumption data are already evident. Consumption of livestock products is declining in the developed PECC economies, while consumption of fruit and vegetables is increasing. An aging population generally prefers “quality” to “quantity” and a more healthy diet. Older people prefer convenience, smaller servings, and full-service restaurants.

According to a USDA study, older people consume food prepared at home more often than do younger people, and eat more fresh fruit, fish, eggs, lettuce, and non-fried potatoes (Lin et al., p. 23). A Japanese study concludes that there are three influences on food consumption: the period effect in which income and price changes affect all consumers at the same time; the age effect where changes occur as a person grows older; and the cohort effect, reflecting eating habits common to a particular age group. The analysis, limited by data covering only at-home consumption, suggests that per capita meat consumption may decline as the population ages because of the negative cohort effect — the tendency for older Japanese to eat less meat because “eating habits may be formed generally at a very young age” (Mori, 317). The opposite may be the case for fresh fruit, rice and fish. Older Japanese are clearly more likely to eat their mid-day meal at home, which has implications for lunchtime food service. In Malaysia, consumption of rice and wheat tends to increase until the mid-40s, and declines thereafter. The consumption of meat, fish and fruits, however, tends to increase until the mid-60s, and declines afterwards. The aging of Chile’s population is leading to smaller family sizes and increased demand for ready-to-cook foods, frozen foods and microwave cooking.

The indirect effects of demographic change are felt in the general economy. Changes in the relative proportion of “economically active” and “economically dependent” components of a population influence economic growth, which in turn, has direct effects on an economy’s food demand and supply.

A number of studies demonstrate the strong role demography played in the economic miracles of East Asia and Southeast Asia (Krugman, pp. 62-78). Similar analysis explains the recent strong economic performance of coun-

The oldest PECC populations are in East Asia and in the developed economies of Australia, Canada, New Zealand and the United States.
“boost to development is not automatic...because there is no guarantee that governments, institutions, or individuals will spend the savings wisely.” (East West Center, p. 7) On the other hand, in the richer economies when the dependent component of the population is rising, labor shortages and higher wages may eventually give impetus to capital-labor substitution, and more highly productive workers who are better able to support the relatively larger dependent segment of the population. It may also lead to less restrictive immigration policies.

Age and family structure also affects peoples' propensity to save and invest, which affects an economy's productive capacity. Recent academic work suggests that population aging in Australia, Canada, New Zealand and the United States will reduce savings and investment rates over the next 20 years, with spillover effects on growth and productivity.

Recent research also suggests that entrepreneurial and innovative behavior is highest before an individual turns 40 years of age. Lipset and Meltz (1997) observe that the probability an individual will favor performance over seniority declines progressively with age, dropping slowly but steadily between 18 and 34 years of age, leveling off between 35 and 54, and declining rapidly after age 55.

**Recommendations**

Powerful economic forces generated by demographic changes require the close attention of food system policymakers. Some demographic changes — such as declining fertility and mortality rates and the aging of a population — take years to become clearly visible. Others, like urbanization, may have more immediate impacts. Given these trends:

- Policymakers and the food marketing system must adjust to greater concentrations of people in urban areas.
- Food system efficiency as well as farm-level productivity, must be a fundamental public policy goal.

This is consistent with the Asia Pacific Economic Cooperation Forum's (APEC) Open Food System Initiative (Box 3). Public and private investment in domestic food system infrastructure and more liberal food trade policies will be essential to ensure cost- and operation-efficient food systems. Less centralized distribution systems will play a more significant role in overcoming the high cost of traffic congestion and other

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**BOX 2: JAPAN’S POPULATION IS AGING RAPIDLY AND WILL SOON BEGIN TO SHRINK**

Japan’s population will begin to shrink in 2007, when its death rate surpasses its birthrate (Figure 11). As the largest net importer of food in the world, Japan will serve as a laboratory for understanding the impact of declining population and other demographic changes on the food system. It is expected that Japan’s aggregate food demand will gradually decline with fewer people to feed; per capita food demand will also decline with the rapid aging of the population and a growing share of more sedentary, less active people (Figure 12). Japan’s economic growth will be affected by a declining savings rate, on the one hand, and rising demand for capital to offset growing labor shortages, on the other. As a consequence, this historically capital-surplus economy could see that surplus diminish.

Demographic pressure affects the future of Japan’s agriculture and its approach to trade policy. Japan’s farm population is aging more rapidly than the rest of its population and, as in many Western economies, the distribution of farming enterprises is becoming more polarized. There are fewer farms overall and the numbers of both very large farms and very small farms are increasing. This is explained in part by the rapid aging of the farming population; people aged 65 or older account for more than 25 percent of the total farm household population and almost half of those “primarily engaged in agricultural production.” As the farm population ages, the number of households raising livestock, growing fruit and engaging in greenhouse farming—all very labor intensive enterprises—will decline at a faster rate than other enterprises. For example, some vegetable farmers have stopped growing crops like watermelons and pumpkins because of the physical strength required to handle these commodities (Campbell).

In time, Japan’s agri-food system will face the options of (a) relying more heavily on migrant and tenant workers from overseas; (b) increasing the rate of consolidation in land holdings and the substitution of capital for labor; (c) altering the mix of production agriculture to reflect the capabilities of its farming workforce, thus remaining self reliant but with fewer food choices and nutritional options; and (d) becoming more open to trade liberalization.

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**WHERE DEMOGRAPHICS WILL TAKE THE FOOD SYSTEM**

States will reduce savings and investment rates over the next 20 years, with spillover effects on growth and productivity.

Recent research also suggests that entrepreneurial and innovative behavior is highest before an individual turns 40 years of age. Lipset and Meltz (1997) observe that the probability an individual will favor performance over seniority declines progressively with age, dropping slowly but steadily between 18 and 34 years of age, leveling off between 35 and 54, and declining rapidly after age 55.
**Figure 9** Caloric Requirements* Decline With Age and Are Lower for Women

(FOR PERSON 5' 10, 190 LBS; OR 1.77 M, 86.2 KGS)

*Basal energy requirements — calories needed to maintain basic bodily functions but not daily physical activity

**Figure 10** PECC Dependency Ratios, 2000 and 2020

A dependency ratio tells us the number of dependent members of the population per working member. The ratio .5 indicates that there is .5 dependent per worker or 1 dependent per 2 workers.

Source: http://www.hononline.com/howtocalour.html #TOTALCALORICREQUIREMENTS

Source: Table 1
The higher incomes and greater food demand from urbanization must be balanced against more sedentary lifestyles and lower per capita caloric needs. More affluent and health-conscious consumers will demand greater quality, variety and convenience from the food system. Policymakers need to anticipate the needs for trained professionals to implement and monitor quality control systems, like agri-food HACCP technicians, crop and animal health scientists, and other professionals.

The variability in the growth and characteristics of populations over the next two decades has important implications for public policy, as well as the food marketing and investment strategies of the private sector. The most rapid growth—occurring in the developing markets of Southeast Asia and Latin America—requires policies that support domestic food production or importation. The biggest absolute growth—occurring in the three most populous economies of China, Indonesia and the United States—requires policies to mitigate rural-urban conflicts; to support production, marketing and trade; and to assure sustainability of the food system. Declining populations—such as in Japan and Russia—will require changes in the foods supplied, supported by changes in domestic agricultural policies and more flexibility in trade policies.

For the private sector, food marketing and investment strategies will, more than ever, require customization for each country. Japan is currently the largest net importer of food in the world, but its population is aging rapidly and...
Figure 11  
Japan's Population Begins to Decline in 2007

Source: UN

Figure 12  
U.S. and Japan: Comparing Population Age Structures

Source: UN
will soon decline. Investment and marketing strategies must address an overall reduction in food consumption and changes in the types of foods consumers demand. The United States, where immigration is expected to result in rapid population growth, strategies must target many more consumers, as well as changes in the population’s ethnic mix. The largest absolute growth in population across the region will be in China. This, combined with rapid urbanization, requires a focus on market logistics in a densely-populated area and the changing preferences of higher income consumers.

Aging populations will generate changes in food demand that have significant implications for the food system. The aging of the region’s population will slowly lead to lower per capita food consumption and a shift in the composition of food demand. Changes in the composition of food demand are likely to include more fresh fruits and vegetables, less meat and less eating out. This has important implications for producers, processors, retailers and food service establishments. Policy adjustments must encourage and facilitate needed changes.

Policymakers must work to mitigate the adverse impacts that aging populations will have on economic growth, a leading driver of food demand. Responses may include: extending the working lives of people; raising worker productivity so fewer people can support more retirees; reducing public obligations for pensions and health care services; relaxing controls on immigration; and adopting policies to encourage higher fertility rates.
GLOSSARY OF TERMS

BASE METABOLIC RATE (or BMR) is the number of calories a human being needs to maintain basic bodily functions, such as heart beat, respiration and normal body temperature. The BMR does not account for the caloric requirements for daily physical activity. (http://www.hononline.com/howtocalyour.html#TOTALCALORICREQUIREMENTS)

DEMOGRAPHIC BONUS is the potential economic boost from relatively faster growth in the productive/working segment of the population relative to the dependent segments.

DEMOGRAPHIC TRANSITION is a decline in the fertility and mortality rates of a population that occurs as an economy gets richer.

DEMOGRAPHY is the scientific study of the size, composition and spatial distribution of human populations; and the changes that occur in these phenomena through the processes of fertility, mortality, and migration.

DEPENDENCY RATIO is the number of young and elderly relative to the number of working people in the population.

EMIGRATION is the process of leaving one country to take up permanent or semipermanent residence in another.

ETHNIC refers to a religious, racial, national, or cultural group.

FERTILITY RATE is calculated as the number of births per 1,000 people in a population.

IMMIGRATION is the process of entering one country from another to take up permanent or semipermanent residence.

MORTALITY RATE is calculated as the number of deaths per 1,000 people in a population.

NET MIGRATION is the net effect of immigration and emigration on an area’s population in a given time period, expressed as an increase or decrease.

POPULATION MOMENTUM is the tendency of a population to continue to grow despite reaching a replacement fertility rate because of the growing number of child-bearing females.

RACE refers to a local geographic or global human population distinguished as a more or less distinct group by genetically transmitted physical characteristics.

RATE OF NATURAL INCREASE is the rate at which a population is increasing (or decreasing) in a given year due to a surplus (or deficit) of births over deaths, expressed as a percentage of the population.

URBANIZATION is the increase in the density of settlement and/or business and other activities of an area over time. The process occurs as an expansion of the existing population, incoming migration, or a mixture of both.

A city population is dependent upon its “hinterlands” or foreign sources to supply it with food. Not until agriculture developed could hinterlands provide food for their own populations and enough surplus to feed a city population. And in agricultural societies the surplus was so small that only a tiny proportion of an entire population could live in cities. Up until very recently – about 200 years ago – that proportion was limited to about 5 percent of an entire population. (www.faculty.fairfield.edu/faculty/hodgson/Courses/so11/population/urbanization.htm)

ZERO POPULATION GROWTH is when a population is in equilibrium, with a growth rate of zero, achieved when births plus immigration equal deaths plus emigration.

Sources: Most definitions are taken from Population Reference Bureau (www.prb.org)

ABBREVIATIONS USED IN THE PACIFIC FOOD SYSTEM OUTLOOK

APEC—Asia Pacific Economic Cooperation Forum
BMR—Basal Metabolic Rate
FAO—Food and Agricultural Organization
HAACP—Hazard Analysis and Critical Control Points
HRS—Household Responsibility System
OFS—Open Food System
PECC—Pacific Economic Cooperation Council
TVE—Township and Village Enterprises
UN—United Nations
USDA—United States Department of Agriculture
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In addition to research reports and commodity analyses, ERS publishes Amber Waves, a new magazine covering the full range of the agency’s research and analysis, including the economics of agriculture, food, rural America, trade and the environment.

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http://www.farmfoundation.org
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The East-West Center
http://www.EastWestCenter.org/
The East-West Center is an internationally recognized education and research organization established by the U.S. Congress in 1960 to strengthen understanding and relations between the United States and the countries of the Asia Pacific region. The Center carries out its mission through programs of cooperative study, training and research. As a national and regional resource, the Center offers an interdisciplinary research program, dialogue and professional enrichment programs, and educational programs. Funding for the East-West Center comes from the U.S. government, international organizations, corporations, foundations and Asia Pacific governments.

The College of Tropical Agriculture and Human Resources (CTAHR),
University of Hawaii
www.ctahr.hawaii.edu/ctahr2001
The College of Tropical Agriculture and Human Resources (CTAHR) was established in 1907, as the College of Agriculture and Mechanical Arts and became the first college of the newly founded University of Hawaii in 1920. As a land-grant college, CTAHR is charged with three broad responsibilities: extension programs that provide outreach and non-formal education to Hawaii’s industries and communities; formal instruction of students through degree programs; and research that generates new knowledge about tropical crops, products, environments and communities. The vision of CTAHR is to actively help Hawaii diversify its economy, ensure a sustainable environment and strengthen its communities, with the aim of being the premier resource for tropical agricultural systems and resource management in the Asia-Pacific region.
The Pacific Economic Cooperation Council (PECC) is an independent, policy-oriented organization devoted to promoting economic cooperation in the Pacific Rim. PECC brings together senior government, academic, and business representatives from 22 economies to share perspectives and expertise in search of broad-based answers to economic problems in the Asia Pacific region.

Founded in 1980, PECC now comprises member committees from the economies of Australia; Brunei; Canada; Chile; China; Colombia; Ecuador; Hong Kong, China; Indonesia; Japan; Korea; Malaysia; Mexico; New Zealand; Peru; the Philippines; Russia; Singapore; Chinese Taipei; Thailand; the United States; and Vietnam as well as the Pacific Island Nations. France (Pacific Territories) and Mongolia were admitted as associate members in April 1997 and April 2000, respectively. The Pacific Basin Economic Council (PBEC) and Pacific Trade and Development Conference (PAFTAD) are institutional members of PECC.

PECC's governing body is the Standing Committee, which meets twice a year and consists of the chairs of PECC committees in each member economy. The day-to-day administrative and coordinating functions are carried out by an International Secretariat based in Singapore. Each member committee sends a high-level tripartite delegation from government, business, and academia to the PECC General Meeting held every two years.

In addition, PECC establishes forums, task forces, projects and networks to concentrate on particular policy areas. These groups meet periodically, organize seminars and workshops, conduct studies, and publish their conclusions and recommendations for the benefit of the Pacific community. In 2001, PECC initiated forums on trade, finance, and community building. Task force topics include capital and financial markets, human resource development, Pacific Island Nations IT, and sustainable cities. PECC also supports projects on food, minerals, energy, telecommunications, air transport and transportation and publishes annual editions of *Pacific Economic Outlook* and *Pacific Food System Outlook*.

At the regional level, PECC's most important link with government is through APEC. PECC is the only nongovernmental organization among the three official APEC observers. PECC representatives attend APEC ministerial meetings, senior officials meetings, and working group meetings. PECC also works with other international organizations such as the World Trade Organization, the Organization for Economic Cooperation and Development, the Asian Development Bank, the World Bank, and United Nations’ agencies.

For more information, contact the PECC International Secretariat, 4 Nassim Road, Singapore 258372, Tel: 65-6737 9823, Fax: 65-6737 9824, email: peccsec@pecc.net
The *Pacific Food System Outlook* represents the first regionwide coordinated effort to provide the outlook for the Pacific food system. The food system includes not just production agriculture, but also the whole complex of economic relationships and linkages that tie the region's food consumers to producers. The goal of the *Pacific Food System Outlook* is to help increase knowledge about the diverse components of this vital segment of the global economy.