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Demographic Change in China and Its Implications for Australia's Meat Industry

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GLOSSARY

ABS	Australian Bureau of Statistics
CBR	Crude Birth Rate
CDR	Crude Death Rate
DIAC	Department of Immigration and Citizenship (now DIBP)
DIBP	Department of Immigration and Border Protection (formerly DIAC)
EU	European Union
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
Gini Coefficient	a measure of the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution
Hukou	Household registration system in China
Long term movement	Temporary visa holders arriving and residents departing temporarily with the intention to stay in Australia or abroad for 12 months or more, and the departure of temporary visa holders and the return of residents who had stayed in Australia or abroad for 12 months or more
MLA	Meat and Livestock Australia Limited
OECD	Organization for Economic Co-operation and Development
Permanent movement	Persons migrating to Australia and residents departing permanently
Short term movement	Travellers whose intended or actual stay in Australia or abroad is less than 12 months
TFR	Total Fertility Rate, the average number of lifetime births per woman
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UN	United Nations
UNDP	United Nations Development Programme

EXECUTIVE SUMMARY

This report seeks to understand the key current and impending changes in the populations of China and how this will impinge on meat and consumption demand over the next decade. The changing demography of China is significant and yet, it is largely neglected in consumption analyses in terms of meat. Chapter 1 established the context of this report and outlines the importance of quantifying and projecting key population changes not only in terms of composition but also, spatial distribution. Identifying and understanding these aspects of China's population will not only shed light on the future demand for red meat in China and whether Australian suppliers compete to meet this increased demand but also highlight apparent opportunities for the Meat and Livestock Industry in Australia (MLA).

Chapter 2 discusses the relevance of incorporating population analysis alongside other conventional measures such as income and relative price changes to assist in predicting meat consumption. The following dimensions of population analysed are demography, dynamics of change in the size, characteristics and spatial distribution of population, key towards identifying the specific demographic dimensions that influence the demand for red meat in China. Further, in addition to the characteristics laid out by the Rotterdam Model in predicting meat-consumption, it is posited that other characteristics need to be considered to enhance understanding on individual meat consumption in China. They include, income, socioeconomic status, access to media, westernisation and household type/structure. This chapter also underscores the importance of understanding how migration is associated with shifting attitudes and consumption patterns, a pertinent theme which needs to be explored when considering how there has been an unprecedented increase in personal mobility and population redistribution over the last quarter century.

Chapter 3 details the trends in red meat consumption in China which underlines the enormous dynamism in contemporary Chinese food consumption. Some of the key issues discussed in this chapter are of particular interest to the consideration of potential future trends with respect to meat consumption. They include:

- The consumption of meat, including red meat is coming from a very low base. It is clear that pork is the most widely consumed meat in China, nonetheless, consumption levels of pork, poultry and beef have increased significantly and is forecasted to continue to increase.

- It is important to note that household surveys in China underestimate consumption levels of beef (as well as mutton). This is largely attributed to the cultural or culinary unfamiliarity of beef among Chinese consumers. A significant amount of beef consumption takes place away from homes and in restaurants.

- There is some disparity between rural and urban areas with the consumption levels of the former adjudged to be '30 years behind that of urban areas'. This difference appears to be widest for beef.

- Socioeconomic differentials are also a factor with higher income earners likely to consume higher levels of beef (and mutton). The top income quintile is about 50 percent higher than the lowest in both urban and rural areas.

- Regional patterns emerge in the spatial analysis of where consumers of beef and mutton are distributed across China. It is clear that beef (and mutton) consumption are highest in China's north and northwest regions and the south is seen to be the lowest. These patterns are most marked for rural areas.

- Overall, in comparison with beef, mutton consumption in China has changed little in the last decade.

Chapter 4 examines China's changing demography. It is evident that the importance of Chinese demographic trends cannot be overstated and these trends will certainly influence patterns of food consumption. Recent developments in China's demography are summarised in this chapter, they include population change dynamics, ageing and changing age-sex structure, changing income levels and changing households and families. Understanding these developments will assist in understanding current and future trends of consumption levels in China. The demographic processes that shape this change are mortality, fertility and migration.

The 2010 Chinese census puts China's population at 1.34 billion which is anticipated to peak at 1.395 billion in 2026 and thereafter being to decline. Due to the speed of its transition to low fertility and mortality decline, China gained its status as a 'Demographic Overachiever'. However, this has implications on the size, structure and functioning of families which must impinge on food consumption. As a result of its fertility and mortality trends, China's age composition has changed significantly with the creation of a 'youth bulge' as well as an ageing population, impacting on its dependency ratio of working ages to dependent ages. It is believed that the large birth cohorts of the 1960s and 1970s are past their peak productive ages and moving towards less productive working ages and retirement. Further, it is argued that the growth rate of net consumers will exceed that of net producers in the near future. The changing composition of China's population will have massive implications for good and services and is crucial in understanding food consumption as the amount of food as well as the mix of types of desired food varies with age.

Other drivers influencing food consumption patterns also include income. It is clear that with massive changes in China's GDP per capita, income growth has played a significant role in explaining its increased meat consumption. Additionally, there are rural and urban differences in

terms of population composition as well as income growth suggests that the former will have an older demographic profile and lower income levels compared to the latter. This rural-urban difference will certainly have an impact on food consumption not only due to affordability but also preference for particular food types. Changing household and family structures in China are also a factor. There is a reduction in the size of Chinese families as well as an increase in the diversity of family and household types. The decreasing size of families and households in China more or less began since the 1970s, with a shift away from three and two generation households towards one generation or single-person households. The latter in particular has important implications on food consumption. Further, 'Empty Nest' and 'Double Income No Children' families (as well as cohabitation and homosexual families which are not lawfully recognised) are on the rise in China. Despite these developments, the display of a combination of traditional, modern and post-modern family and household types in China remains the fundamental unit of social organisation and will influence consumption patterns.

Chapter 5 outlines the role of internal migration on the changing patterns of mobility and spatial distribution of China's population. As a cause and consequence of the rapid economic and social transformation since the early 1980s, personal mobility has reached unprecedented levels in China. The mass movement of people across China stimulates social, economic and cultural changes which has implications on the spatial distribution of demand for food. Regions that have benefited from rapid population growth are situated in the heavily urbanised areas of the East Coast and Western frontier provinces. The three fastest growing areas are Beijing, Shanghai and Tianjin and to a lesser extent Guangdong and Zhejiang. The population increase in these areas is underscored by the fact that they account for 55 percent of all intercensal population growth. Other high growth provinces in the West include Tibet (Xizang), Xingjiang and Ningxia. The population decrease experienced by provinces located in Central China due net migration losses serve to further emphasise the inequalities in regional economic development and how it relates to food consumption patterns.

Chapter 6 further expands on internal migration in China by focusing on makeup of residents living in urban areas. As mentioned in earlier chapters, a substantial proportion of urban residents originate from rural areas. However, massive inequalities due to the complexities associated with transferring one's *hukou* (household registration system) from one administrative region to another, particularly from rural to urban regions resulted in the creation of the urban *hukou* and the *floating population*. There is a real division between the two groups with the latter often deprived of the same rights as the urban *hukou* in areas such as employment, voting, social security and other social systems; an important consideration when analysing urban food consumption patterns in China. In

addition, China has urbanised at a rapid rate in the last few decades with 68.7 percent of its population projected to live in urban areas by 2030. There are several distinctive features associated with the rapid urbanisation of China. Firstly, many megacities (with more than 10 million residents) have emerged in this process. Secondly, there is a strong coastal orientation with the distinct spatial distribution of large urban areas located in the east. Thirdly, the rate of urbanisation in China is unprecedented with massive increases in the number and size of towns and cities. This alongside the '*in situ* urbanisation' of cities that swallow up surrounding rural and peri-urban areas serves to underline the speed and scale of this development. Another important feature is the increasing ethnic diversity of urban areas which partly due to the inmigration of ethinc minorities from the west but more importantly due to the growing expatriate community from Europe, North America and Oceania. There are substantial numbers located particularly in the largest cities in the east and with the expansion of foreign companies into China and the need for skilled foreign workers, the number of expatriates is likely to grow; an important consideration as they are an important market segment for meat in Chinese cities. The continuing role of internal and international migration is further emphasised by the ageing of China's cities which necessitates considerable 'replacement migration' in order for their demographic, economic and social sustainability. These features must be considered as they demonstrate how rapid urbanisation in China has implications on consumption such as the spatial distribution on demand in large cities in the east, the pace of growth of demand in previously less urbanised areas and the role of continuing net migration gain in Chinese cities which will fuel demand for meat. The chapter also further details the movement of people, both Australian and Chinese-born, between China and Australia which is characterised by return, circularity and reciprocity which will influence consumption patterns in China. There is great intensity in their mobility which has implications for the potential marketing of Australian red meat into China.

Chapter 7 provides a summary of the findings of the preceding part of this paper and discusses some of the implications for marketing Australian red meat in China. The significance attributed to demographic factors in changing patterns of food consumption cannot be understated. The key consideration around growth in China is not population growth but the huge gap in the patterns of consumption between urban and rural residents, and the rich and the poor. There is no doubt that food consumption patterns in China, particularly in urban areas have undergone a transformation in the last two decades. A total of 11 recommendations based on the findings reported in this paper are put forth:

- **Recommendation 1:** Targeting the *Eating Out Sector* at all levels making sure not to restrict it to the luxury, high end level.

- **Recommendation 2:** Marketing of Australian beef into China must be accompanied by a concerted campaign to inform and instruct home consumers in the preparation of beef, especially to incorporate in traditional dishes. This needs to be locally targeted.

- **Recommendation 3:** Adopting a two pronged approach of:
    - Protecting and enhancing the luxury, high end market.
    - Expanding the market with less expensive meat products to middle class consumers and a wider section of the food industry.

- **Recommendation 4:** Age segmentation of the Chinese market is stronger than in Australia and there are four segments which need to be addressed separately. The 15-24 market is especially open to increased meat consumption.

- **Recommendation 5:** Urban China will experience increase demand for meat, and consumption per head is much higher than in rural areas. Concentrating efforts to market red meat in large urban markets, especially those where average income levels are highest and increasing fastest has potential.

- **Recommendation 6:** It should be investigated as to whether meat products can form part of the basket of 'city foods' which many migrant workers take back to their village on their regular visits.

- **Recommendation 7:** The market for red meat in rural China must not be neglected and strategies involving particular meat products concentrating in areas with growing incomes should be considered.

- **Recommendation 8:** The potential for marketing Australian meat in areas with concentrations of ethnic minorities with higher propensity to eat meat should be investigated.

- **Recommendation 9:** The largest urbanised areas with their high concentrations of the market segments of top decile income group, foreign-born expatriates and large tourist and business visitor population are the safest bet of an established eating community with a sustained and increasing demand for meat, albeit, limited amounts.

- **Recommendation 10:** There needs to be a close study of the changing size, composition (e.g. national background) and location within China of the growing foreign population and the marketing of premium meat products adjusted to take these changes into account.

- **Recommendation 11:** As the Chinese presence in Australia expands exponentially and the channels of communication between Australia and China intensify, there needs to be a detailed study to investigate how this in itself can be a significant premium market but also

how it can be used as a bridgehead to facilitate the wider consumption of Australian red meat in China.

There are many dimensions driving these changes and this paper has sought to focus on the significant role of demography and its impact on influencing food consumption patterns. However, to fully understand the nature and effect of demography and to anticipate future changes and to translate them into clear market signals for the Australia meat industry will require more work.

RECOMMENDATIONS

1. Targeting the *Eating Out Sector* at all levels making sure not to restrict it to the luxury, high end.

2. Marketing of Australian beef into China must be accompanied by a concerted campaign to inform and instruct home consumers in the preparation of beef, especially to incorporate in traditional dishes. This needs to be locally targeted.

3. Adopting a two prong approach of:

   (a) Protecting and enhancing the luxury, high end market.

   (b) Expanding the market with less expensive meat products to middle class consumers and a wider section of the food industry.

4. Age segmentation of the Chinese market is stronger than in Australia and there are four segments which need to be addressed separately. The 15-34 market is especially open to increased meat consumption.

5. Urban China will experience increased demand for meat, and consumption per head is much higher than in rural areas. Concentrating efforts to market red meat on large urban markets, especially those where average income levels are highest and increasing fastest, has potential.

6. It should be investigated as to whether meat products can form part of the basket of 'city foods' which many migrant workers take back to their village on their regular visits.

7. The market for meat in rural China must not be neglected and strategies involving particular meat products concentrating in areas with growing incomes should be investigated.

8. The potential for marketing Australian meat in areas with concentrations of ethnic minorities with higher propensity to eat meat should be investigated.

9. The largest urbanised areas with their high concentrations of the market segments of top decile income group, foreign-born expatriates and large tourist and business visitor population are the safest bet of an established meat eating community with a sustained and increasing demand for meat, albeit, limited amounts..

10. There needs to be a close study of the changing size, composition (e.g. national background) and location within China of the growing foreign population in China and the marketing of premium meat products adjusted to take these changes into account.

11. As the Chinese presence in Australia expands exponentially and the channels of communication between Australia and China intensify, there needs to be a detailed study to

investigate how this in itself can be a significant premium market but also how it can be used as a bridgehead to facilitate the wider consumption of Australian red meat in China.

1.   INTRODUCTION

With 19.9 percent of the world's population and 14.9[1] percent of the global economy, China must loom large in any discussion of Australian exports. There are a number of elements to consider in assessing the potential for exporting any commodity to China from Australia, including trade policy, geographical proximity, changing tastes, economic development and a plethora of cultural and social forces. However, the changing demography of China is significant. The number, characteristics and spatial distribution of the population shapes the level, nature and distribution of demand for almost all goods and services, but especially for food. Yet it remains a neglected dimension in analyses of the demand for meat (Wilson and Marsh, 2005). Yet in any community demand is a function of:

1.   The number of potential consumers.

2.   Their per capita consumption.

Demography obviously has a lot to say about the first but its major impact on the second is often overlooked.

Moreover an important aspect of populations is that they are dynamic. Populations are in a constant state of change and those changes will of course impact substantially on both 1 and 2 above and hence on the *changing pattern and level of demand* for meat. Yet this also is overlooked. Demographic change is incremental and gradual and never sudden. This means that unlike much economic and political change:

- It doesn't attract the attention that dramatic sudden changes do so that it often 'creeps up' on us and surprises us.

- Identifying these changes can be a powerful tool in predicting future changes. There is more certainty about much future dramatic change than there is of economic forecasts.

Accordingly, in assessing the potential demographic influences on future levels of demand for meat in China it is necessary to not only present a picture of the contemporary demography but also of how it is changing and at what speed to inform migration of future demand.

The present study has the broad objective to identify the key current and impending changes in the populations of China which are likely to impinge on meat demand and consumption over the next decade. More specifically it will:

- Summarise and quantify the key recent developments and projected change over the next decade in the population of China focusing on:
    - Size, numbers, rate of change, internal and international migration.
    - Composition-age, income, households/family.

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[1]   Source: Eurostat, 2014.

- Spatial-distribution – urban/rural, regional.

- Discuss the implications of these trends for potential change in meat consumption drawing upon the literature on culture, regional distinctiveness, patterns of food distribution and consumption.

- Spell out apparent opportunities for the MLA.

  In approaching these aims we need to be cogniscent of two separate, but connected, issues:

- To what extent can we expect an increased level of demand for red meat in China?

- To what extent can Australian suppliers compete to meet this extra demand?

The major focus of the study is on the first question but some comments are also made on the second.

2.   THE RELATIONSHIP BETWEEN DEMOGRAPHY AND MEAT DEMAND

2.1   Introduction

Before analysing contemporary and impending trends in China's population it is important to examine the nature of the relationship between meat consumption and demography. These relationships are so robust that econometric models have been developed using demographic variables to successfully model meat demand (Mountain, 1988). A great deal of work would be needed to develop and apply such a model to China, both in terms of developing an appropriate set of demographic measures but also in obtaining accurate data to operationalise them. However, it does underline the fact that while in the past, changing patterns of consumption of red meat have been 'principally attributed to income and relative price changes', there is increasing evidence that other relevant and complex forces including changing demographies, have played a role (Wilson and Marsh, 2005, 1). At the outset we will identify the specific demographic dimensions which potentially can influence demand for red meat in China. To do this we will take in turn the three dimensions of the population which are analysed in demography – the dynamics of change in the size, characteristics and spatial distribution of population.

2.2   Population Size and Demand for Meat

As we pointed out earlier, demand for meat in its simplest terms is a function of the number of people/potential consumers and how much they consume on average. From a market perspective, efforts can be directed at:

- Training as many of the people in an area to consumers.

- Increasing how much they consume on average.

Hence part of our analyses here needs to be directed at contemporary and likely future changes in the numbers of people in China who are at least potentially meat consumers. It should be said that the projection of China's future population can be used with a high level of confidence for the 15 year period under consideration here. It would seem extremely unlikely that there will be a major deviation away from the projected trends, even if such a significant change or the abandonment of the one-child policy were introduced.

2.3   Changes in the Composition of the Population

This is an area not only where there is not only considerable scope for influencing levels of meat consumption but also the level and scale of contemporary change in the *characteristics* of China's population is greater and more profound than those in the overall numbers. The Rotterdam Model which has been developed to predict meat consumption in Euro-American countries, for example (Mountain, 1988; Wilson and Marsh, 2005), incorporates the following characteristics of population:

- Age – mean and variance
- Ethnicity
- Health status
- Education level
- Percentage of women who work outside the home

These dimensions can be measured in various ways but we could also, from the literature, add some other characteristics which may influence individual meat consumption in China:

- Income
- Socioeconomic status
- Access to media (television ownership etc.)
- Westernisation (e.g. ability to speak English)
- Household type/structure

2.4   Changes in the Spatial Distribution of China's Population

The type and amount of food consumed is strongly influenced by people's location. The availability of different types of food varies between locations as does the ability of people to be able to pay for different types of food. Moreover migration is often associated with changes in attitudes and in consumption patterns. One of the major differences in this report have been identified between rural and urban locations, although there is also considerable variation *within*

these categories. This is especially relevant in the Chinese case where there has been an unprecedented increase in personal mobility and population redistribution over the last quarter century. All of the literature in this area focuses on *internal* mobility and migration, especially rural to urban shifts. However, there has been a substantial increase in international mobility, and the impacts of this on food consumption are largely unexplained.

3.   TRENDS IN RED MEAT CONSUMPTION IN CHINA

One of the dimensions of the profound and rapid economic and social transformation that China is experiencing is in the level and pattern of food demand, supply and consumption (Dong and Fuller, 2007). China is both the world's largest food producer and food consumer and it is increasingly meeting the demand for food with imports (Zhou *et al.*, 2012, 1). A recent comprehensive analysis of food consumption trends in China (Zhou *et al.*, 2012, vii) makes several summary observations regarding changing food consumption trends in China. These are important to place the present study in context and draw attention to the enormous dynamism in contemporary Chinese food consumption.

- During 2000-2010, total expenditure on foods continued to increase but the proportion of food expenditure out of total living expenditure continued to decline.

- The per capita consumption of staple foods, chiefly rice and wheat, continued to decline. There is likely to be further declines in the per capita consumption of such staple foods.

- While per capita direct consumption of grains has declined, the indirect consumption of grains has increased, chiefly, maize.

- The consumption of higher-value foods, especially foods of animal origin, is increasing. The foods with higher rates of growth include milk and dairy products, aquatic products, poultry meats, and fruits.

- Due to income differences, rural consumption is significantly behind urban consumption. Animal product consumption in rural China is about 30 years behind urban areas.

- The consumption level of some food items by the highest income rural group was even below that of the lowest income urban group in 2010.

- There is a significant gap in the level of consumption between the rich and the poor in both rural and urban areas. For some foods of higher value, the gap is several times larger.

- Food consumption patterns and levels differ between regions mainly due to differences in local income levels, food availability, and ethnic background. Consumption convergence is taking place, but slowly.

- Demand for safe foods of high quality is increasing. Foods of dubious quality have to a small extent negatively affected consumer demand for those foods.

- Chinese consumers, particularly the wealthy, are demanding foods of superior quality. Some of them consume mainly imported foods due to concerns over safety of foods produced in China.'

A number of these observations are of particular interest to the consideration of potential future trends with respect to meat consumption.

Figure 1:   **Continued Growth Projected in China's per Capita Meat Consumption**
Source: Hansen and Gale, 2014
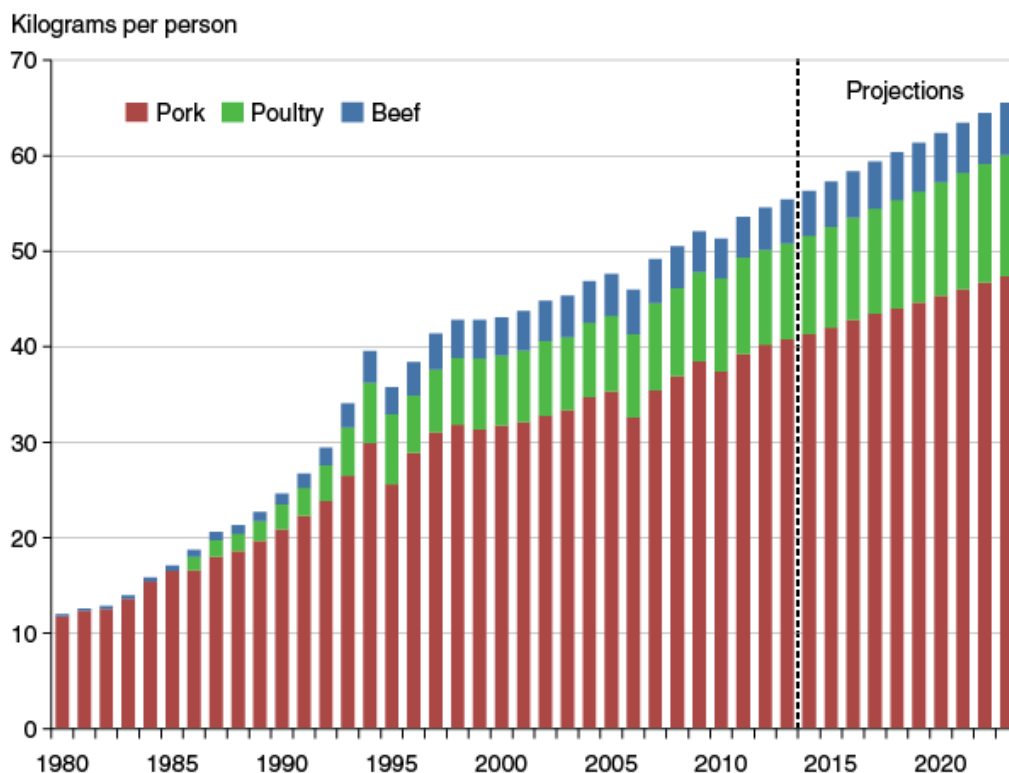
The consumption of meat, including red meats, is coming from a very low base but is increasing. Figure 1 shows per capita consumption of beef, poultry and pork over the 1980-2013

period and projected trends up to 2025. It will be noticed that pork is far and away the most widely consumed meat in China. However, consumption levels of all three have significantly increased and are projected to continue to increase.

Zhou *et al.* (2012) have carefully analysed data collected by China's State Statistical Bureau (55B) from household surveys to examine food consumption trends. There is an important proviso when interpreting these data, however, which is especially relevant to examining meat consumption. The 55B data refer only to 'at home' consumption and does not include 'away from home' consumption. They point out that (Zhou *et al.*, 2012, 16):

> '… a significant amount of beef consumption would have taken place on away-from-home occasions. Many Chinese consumers are reluctant to cook beef dishes at home due to their unfamiliarity with cooking with beef. Consuming beef away from home in restaurants is popular.'

This means that the data in Table 1 based on 'at home' consumption is an underestimate of true consumption. Despite this limitation a number of points can be made regarding beef consumption in China.

Table 1:   **Per Capita Consumption of Animal Products in China (kg), 2000-10**
Source: Zhou *et al.*, 2012, 15

a) Rural

Year	Pork	Beef	Mutton	Poultry meats	Other meats and processed meats	Egg and egg products	Milk and dairy products	Aquatic products
2000	13.28	0.52	0.61	2.81	n.a.	4.77	1.06	3.92
2001	13.35	0.55	0.60	2.87	0.68	4.72	1.20	4.12
2002	13.70	0.52	0.65	2.91	0.64	4.66	1.19	4.36
2003	13.80	0.50	0.80	3.20	1.43	4.81	1.71	4.65
2004	13.50	0.50	0.80	3.10	1.40	4.60	2.00	4.50
2005	15.60	0.60	0.80	3.70	1.70	4.70	2.90	4.90
2006	15.50	0.70	0.90	3.50	1.80	5.00	3.20	5.00
2007	13.40	0.70	0.80	3.90	1.80	4.70	3.50	5.40
2008	12.60	0.60	0.70	4.40	1.80	5.40	3.40	5.20
2009	13.96	0.56	0.81	4.25	1.95	5.32	3.60	5.27
2010	14.40	0.63	0.80	4.17	2.14	5.12	3.55	5.15

b) Urban

Year	Pork	Beef	Mutton	Poultry meats	Other meats and processed meats	Egg and egg products	Milk and dairy products	Aquatic products
2000	16.73	1.98	1.35	7.38	2.41	11.89	11.55	11.74
2001	15.95	1.92	1.25	7.31	2.51	11.10	13.76	10.33
2002	20.28	1.93	1.08	9.22	3.72	10.56	18.12	13.20
2003	20.43	1.98	1.33	9.20	3.84	11.19	21.71	13.35
2004	19.52	2.42	1.50	8.42	3.86	10.61	22.19	12.04
2005	20.15	2.28	1.43	8.97	3.80	10.40	21.67	12.55
2006	20.00	2.41	1.37	8.34	3.80	10.41	22.54	12.95
2007	18.21	2.59	1.34	n.a.	n.a.	10.33	22.17	14.20
2008	19.26	2.22	1.22	n.a.	n.a.	10.74	19.30	14.00
2009	20.50	2.38	1.32	n.a.	n.a.	10.57	19.27	14.30
2010	20.73	2.53	1.25	n.a.	n.a.	10.00	18.10	n.a.

- There can be no doubt that per capita consumption is small but increasing. One reference indicates that beef consumption in 1978 was 0.32 kg per person per year.

- There are very substantial differences between rural and urban areas. As mentioned above, Zhou *et al.* (2012) suggest rural consumption is '30 years behind that of urban areas'. Indeed the rural-urban group in Table 1 is wider for meat than any of the other foods shown in the table. While there are differences between urban and rural areas, consumption for all foods is widest for beef.

- There are very wide socioeconomic differentials in beef consumption in China. Figure 2 and Figure 3, which are drawn from Zhou *et al.* (2012, 18), indicates that per capita consumption of beef and mutton in the top income quintile is about 50 percent higher than that for the lowest in both rural and urban areas. It is noticeable that the difference between the top quintile and *all* other quintiles is greatest in rural areas, indicating a greater concentration of consumption in the highest income group. Figure 3 shows the pattern of consumption in urban areas separately for beef and mutton.

- There are some important regional differences in patterns of meat consumption. Figure 4 indicates that beef consumption is highest in China's north and northwest (Tibet, Xinjiang, Ningxia and Inner Mongolia) while it is lower in the south. These patterns are most marked in the map depicting rural areas. For urban areas, higher levels of consumption are evident in the urbanised southeast and northeast.

Figure 2:   **Per Capita Consumption of Beef and Mutton by Income Group in China, 2000-10**
Source: Zhou *et al.*, 2012, 18
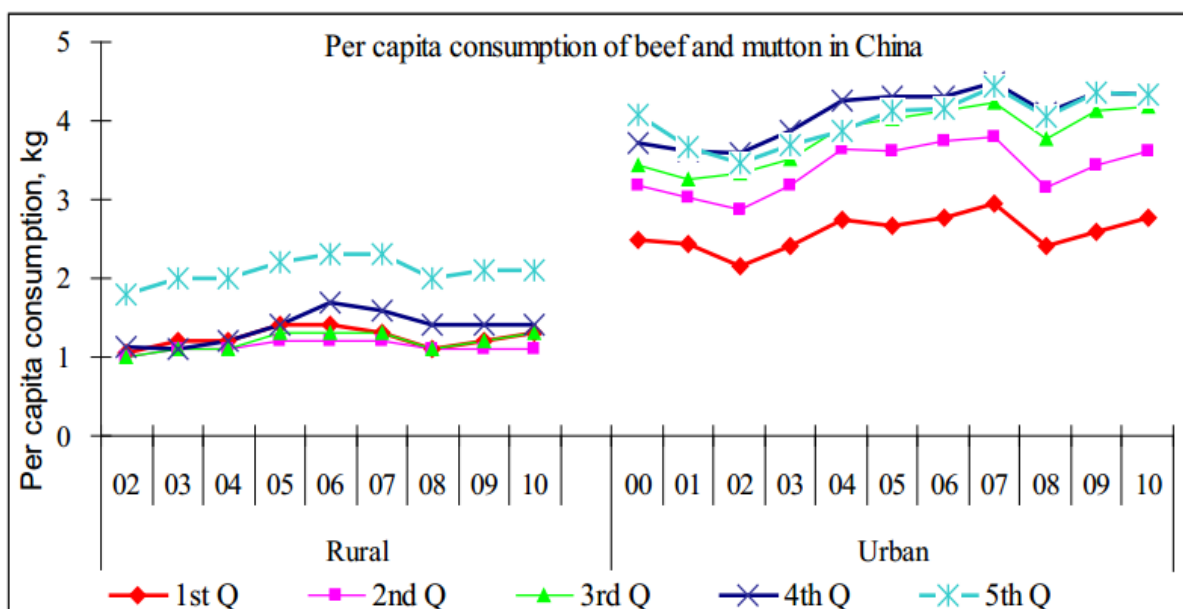
Figure 3: **Per Capita Consumption of Beef and Mutton by Income Group in Urban China, 2000-10**
Source: Zhou *et al.*, 2012, 18
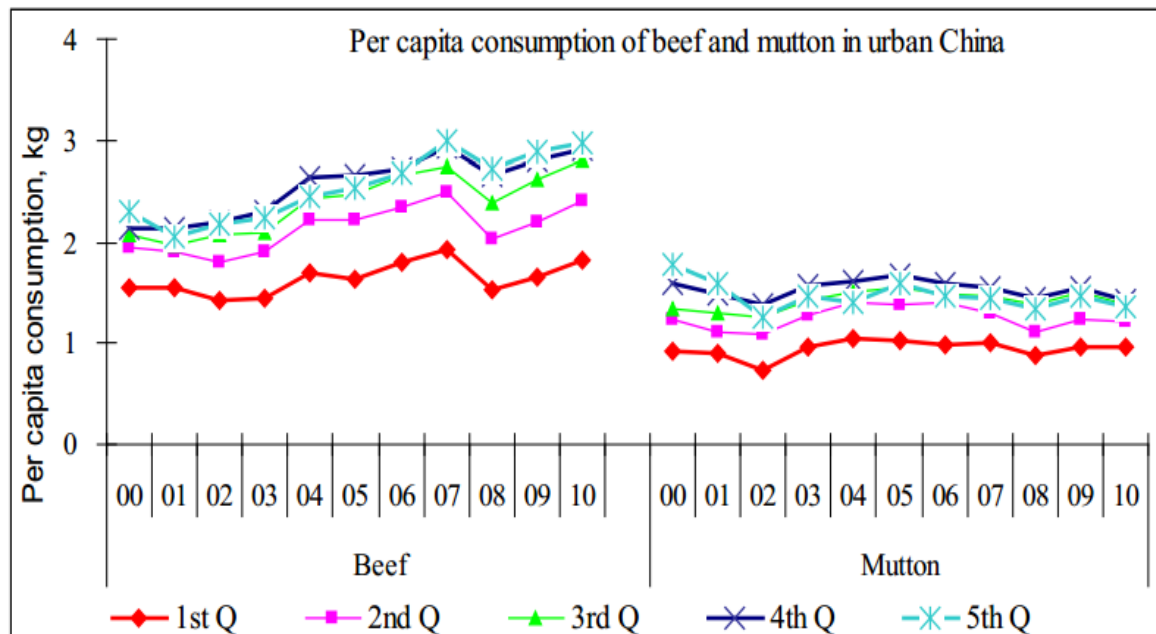
Figure 4: **Per Capita Consumption of Beef in China by Region (kg in rural, yuan in urban), 2009**
Source: Zhou *et al.*, 2012, 19
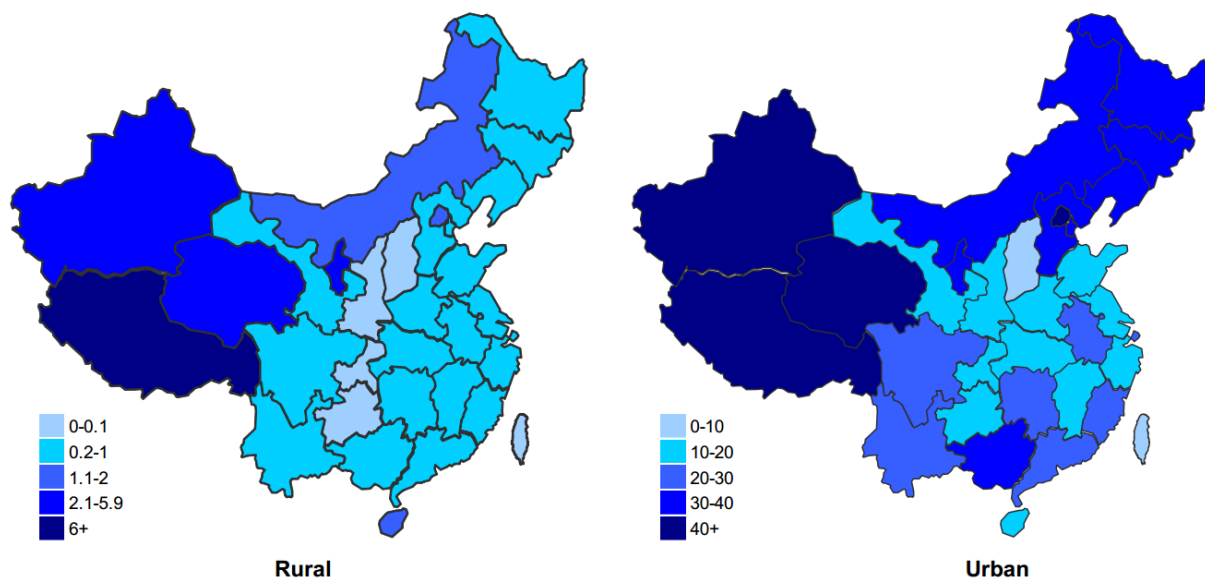
Figure 2 also provides details of mutton consumption and a quite different pattern is in evidence to beef. Whereas both beef and mutton consumption is starting from a low base, there

has been little change in mutton consumption in the last decade. Zhou *et al.*, (2012, 20) again stress that much mutton consumption takes place outside the home in restaurants and other food outlets. It is evident from Table 1 that the urban-rural differences are not as marked as was the case for beef. The large differences between high and low income groups, however, are strongly in evidence in Figure 2 and Figure 3. The consumption of mutton is about 50 percent higher in the highest quintile in both urban and rural areas compared with the lowest. Figure 5 shows a similar pattern of regional differences that were observed for meat. The highest consumption patterns are in north and northwest and lowest in the south, although this is more marked in rural than urban populations.

Figure 5:   **Per Capita Consumption of Mutton in China by Region (kg in rural, yuan in urban), 2009**

Source: Zhou *et al.*, 2012, 21

Rural

Urban
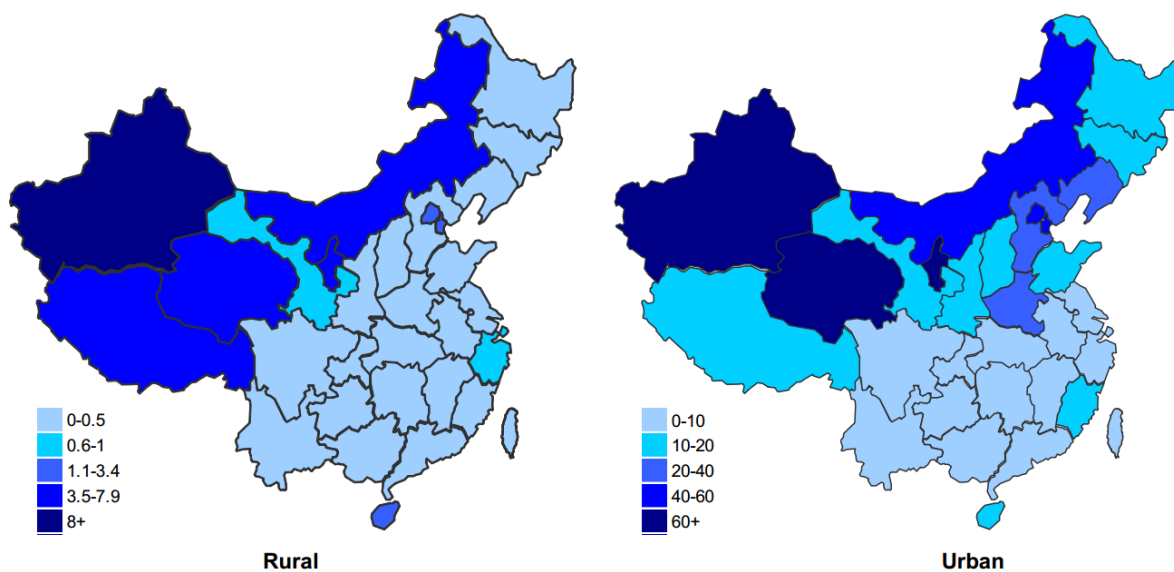
4.   CHINA'S CHANGING DEMOGRAPHY

4.1   Introduction

The importance of Chinese demographic trends cannot be overstated, not only because of their economic and social (let alone political and environmental) implications for China, they '… have profound implications for the Chinese as well as global economy and society' (Cai, 2012, 1). This significance is not only due to a fifth of the global population living within this single nation, it is because the shifts which are occurring within China's demography are both substantial and rapid. They certainly will influence patterns of food consumption as is being considered here but some

would argue that they will impinge in a major way on the continued economic growth of China as well as its political stability and social cohesion.

In this section we will summarise recent developments in China's demography around the three areas identified in Section 2 above, namely:

- Population change dynamics.
- Changes in the consumption of the population.
- Shifts in the mobility and changing spatial distribution of the population.

In all three areas there have been massive changes in recent decades and much more is to come. At the outset we will make a few preliminary observations.

The main source of data used here is the 2010 Chinese census which is generally recognised as being of reasonable quality (Guo, 2011). China's population data have been questioned in the past, especially that relating to fertility and the effects of the one-child policy. However, the census data used here on population numbers, structure and distribution can be considered reliable. DaVanzo *et al.* (2011, 1) point out that official demographic data are limited but improving. Riley (2004, 4) argues:

> 'Given both the size of China's population and the recency of large scale data collections, the quality of early data was surprisingly good'.

However, she also points out that there are difficulties with mortality statistics, births reporting, and measuring the migrant population. Nevertheless, the most recent information can be relied upon to inform the questions addressed by this study (Cai, 2013).

4.2   Population Growth and Dynamics

China's current population of 1,364 million makes it still the largest nation in the world, although India is expected to pass it in 2025 (DaVanzo *et al.*, 2011, 2) and it, together with the Indian subcontinent, has been the most populous region in the world for at least 2,000 years (Durand, 1977). The trajectory of China's population change is depicted in Figure 6. At the 1953 population census its population was 582.6 million and by 1964 had grown to 694.6 million, at an average growth rate of 1.61 percent per annum – a rate severely curtailed by massive death associated with famine. Between 1964 and 1982, however, it grew at 2.1 percent per annum to pass the billion mark. However, rapid fertility decline saw the growth rate fall to 1.48 percent per annum in the 1980s, 1.07 in the 1980s and 0.57 percent in the 2000s. The enormity of this rapid decline in growth rates is expressed by Cai (2012, 1) who argues 'marks a tectonic shift in world demographic history'. The 2010 census put the population at 1.34 billion. It is anticipated that China's population will peak at 1.395 billion in 2026 and thereafter begin to decline (DaVanzo *et al.*, 2011, 2).

Figure 6: **China: Growth of the Population, Actual 1950 to 2010 and Projected 2015-20**
Source: United Nations, 2013a
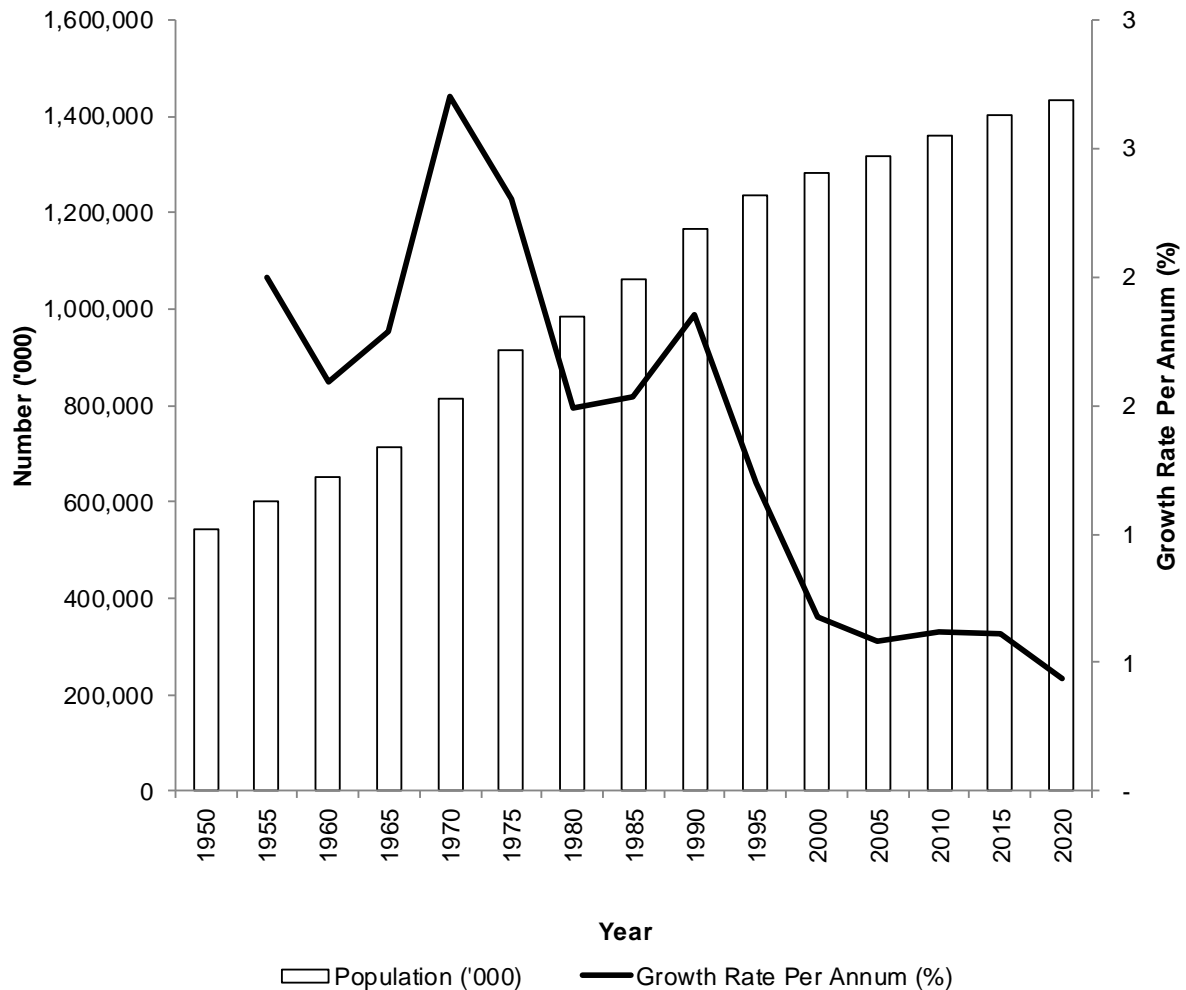
In order to better understand the dynamics of this change it is necessary to analyse the demographic processes which have shaped that change – namely mortality, fertility and migration. At the national level it is mainly mortality and fertility. Examination of trends in these processes also may give some insights into changing patterns of food consumption too. DaVanzo *et al.* (2011) has calculated the components of population change in China in 2010 and compared them with India. They are shown in Table 2 and indicate that the Crude Birth Rate (CBR) is almost twice the Crude Death Rate (CDR) producing a natural increase of 5.28 per 1,000 in that year. However, there is a net migration loss rate (more people leaving China than entering) of .34 per 1,000 so that the overall population gain is 4.9 per 1,000. The long term trends in CDR and CBR are shown in Figure 7 and show how in the famine of 1960 the loss of life was such that deaths outnumbered births. Thereafter there was a wide gap between the birth and death rates producing rapid growth of the

population. However, the CBR began to fall in the 1960s and has gradually converged toward the CDR leading to reduced overall population growth. The CDR and CBR, however, are not very effective measures of fertility and mortality in the population so we will now use more appropriate measures to examine trends.

Table 2:   **Components of Population Change: China and India, 2010**
Source: DaVanzo *et al.*, 2011, 4

Demographic Rate	China	India
Crude birth rate (per 1,000 population)	12.17	21.34
Crude death rate (per 1,000 population)	6.89	7.53
Natural population growth (per 1,000 population)	5.28	13.81
Net immigration (per 1,000 population)	−0.34	−0.03
Annual rate of population growth (%)	0.49	1.38

Figure 7:   **China: Birth and Death Rates, 1949-2013**
Source: Riley, 2004, 6; United Nations, 2013a; UN ESCAP, 2013
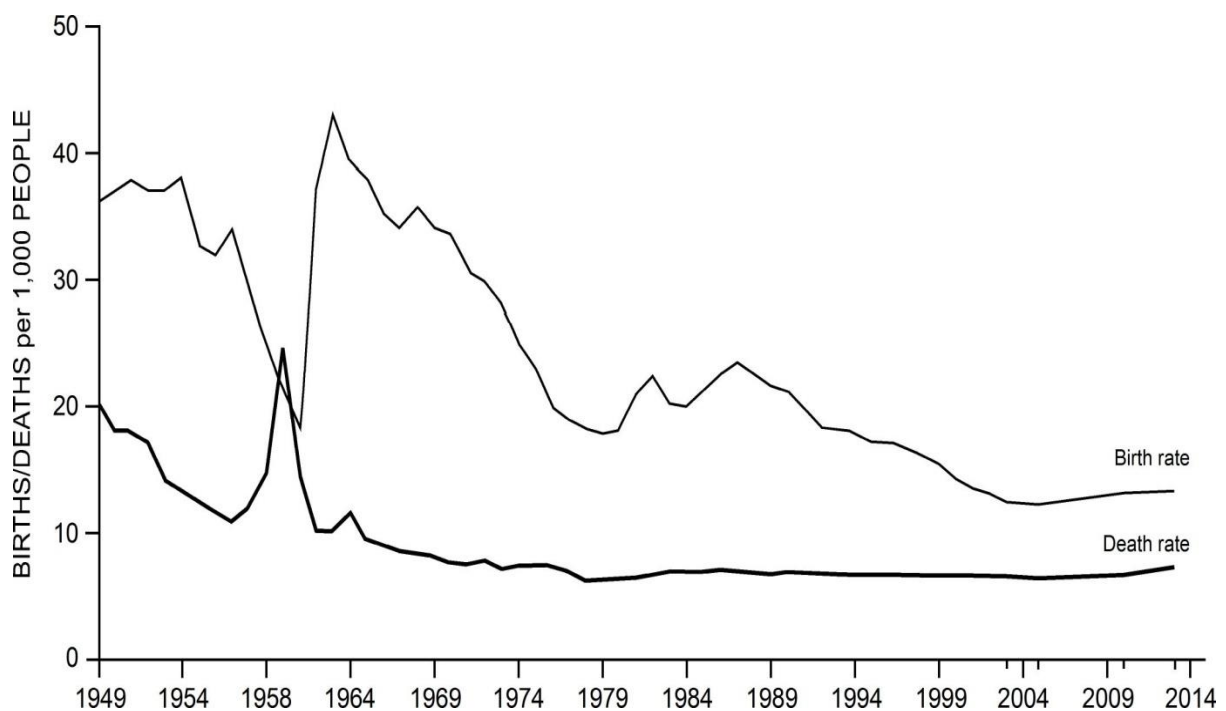
Figure 8: **China: Total Fertility Rate, 1950-2010**
Source: Zhao, 2001; Peng, 2004, 136; 2010 Census of China
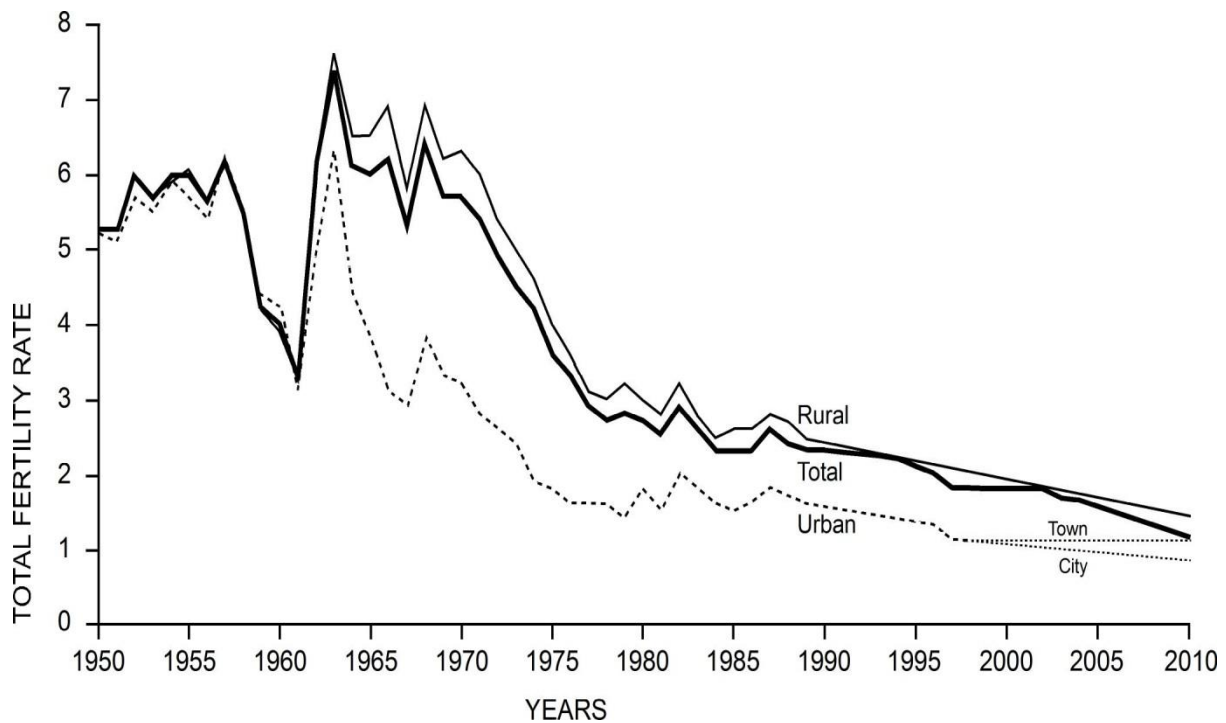
Firstly, with respect to fertility there has been a massive change in China over recent decades as is evident in Figure 8 which shows trends in the Total Fertility Rate (TFR). This is a much better measure of intrinsic fertility than the CBR since it reflects the average number of lifetime births per woman.[2] An important concept here is *Replacement Level* which is a TFR of around 2.1 and is the number of children women need to have to 'replace' themselves and their partner. China first achieved replacement level in 1991. It is sometimes suggested that the cause of China's low fertility is the One-Child Policy introduced in 1979 as a 'temporary' measure to slow population growth. However, it is clear from Figure 8 that the TFR began to decline much earlier than 1979. Cai (2012, 1) points out that the TFR had already dropped dramatically from 5.8 in 1970 to 2.7 in 1978!! In fact, the One-Child Family Policy had only a limited impact in the 1980s. It was only when the economic miracle gained momentum that there was a further decline of fertility below replacement level. As DaVanzo *et al.* (2011, 8) point out:

> '… the emerging market economy, by increasingly placing the financial burden of
> raising children on Chinese families (rather than the state), has probably also

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[2] More specifically it is the number of births a woman would have in her lifetime if at each age she experienced the age specific fertility rates of that year.

contributed to decreasing fertility rates. There are indications that the one-child

way of life has taken cultural hold in the urban Chinese society'.

The One-Child Family Policy was strictly implemented in urban areas and rural couples were allowed to have a second child if their first child was a girl. Gu (n.d.) has shown there is a distinct regional pattern in fertility policy and a clear separation of the west (higher fertility permitted) and the east.

In most countries there tends to be higher fertility in rural areas than in cities. Nowhere in Asia have urban/rural differentials in fertility decline been greater than in China (Lavely and Freedman, 1990; Yao, 1995; Zhao, 2001). Figure 8 shows that in China's dramatic fertility decline, the fall has been more dramatic in urban than rural areas. The Urban Total Fertility Rate (TFR) had fallen to 1.13 in the late 1990s while that in Shanghai was 0.87 (Yuan, 2003) and 0.79 in 2010 (Hays, 2012). One of the lowest rates of any place in the world. Such levels are also recorded in other large cities such as Beijing and Tianjin (Zhao, 2001).

Fertility change of the magnitude of that being experienced in China and some other Asian countries has important implications for social, economic and demographic development. In demographic terms ageing is the key impact. The lower fertility in urban areas is already evident in age structure as is demonstrated in Figure 9 which is drawn from 2000 census data. This shows that while there is an undercutting in the total and rural age pyramids, this is much more ranked in the urban populations.

Data from the 2010 population census have allowed new estimates of China's fertility to be calculated. Cai (2013, 384) used three different methods to estimate the TFR at the 2010 census and concluded that it was around 1.5 or lower. Official government figures, however, put the TFR at a higher level. The low fertility has very important implications for the size, structure and functioning of families, especially in urban areas which must impinge upon food consumption.

Changes in mortality levels have also been quite dramatic. In the first two decades of the twentieth century alone, life expectancy at birth improved by between 3 and 4 years to around 74 for males and 77 for females (Cai, 2013, 371). Wang (2011) has referred to China as a 'Demographic Overachiever' partly because of the speed of the transition to low fertility but also because of a 'highly compressed process of mortality decline'. Table 3 quantifies this spectacular change which saw male and female life expectancy increase a full 30 years between 1950 and 2010. It will also be noted that infant mortality levels have fallen dramatically from around 140 in 1950 to 12.8 in 2013. This represents a massive change which Wang (2011, 174) points out has been much faster than mortality decline in other high income nations. Figure 10 shows this diagrametically comparing the fact that what took more than a century to achieve in European countries was achieved in a few decades in China. Wang (2011, 174) points out:

Figure 9: **China: Age-Sex Composition in Urban, Rural and Total Population, 2010**
Source: Census of China, 2010
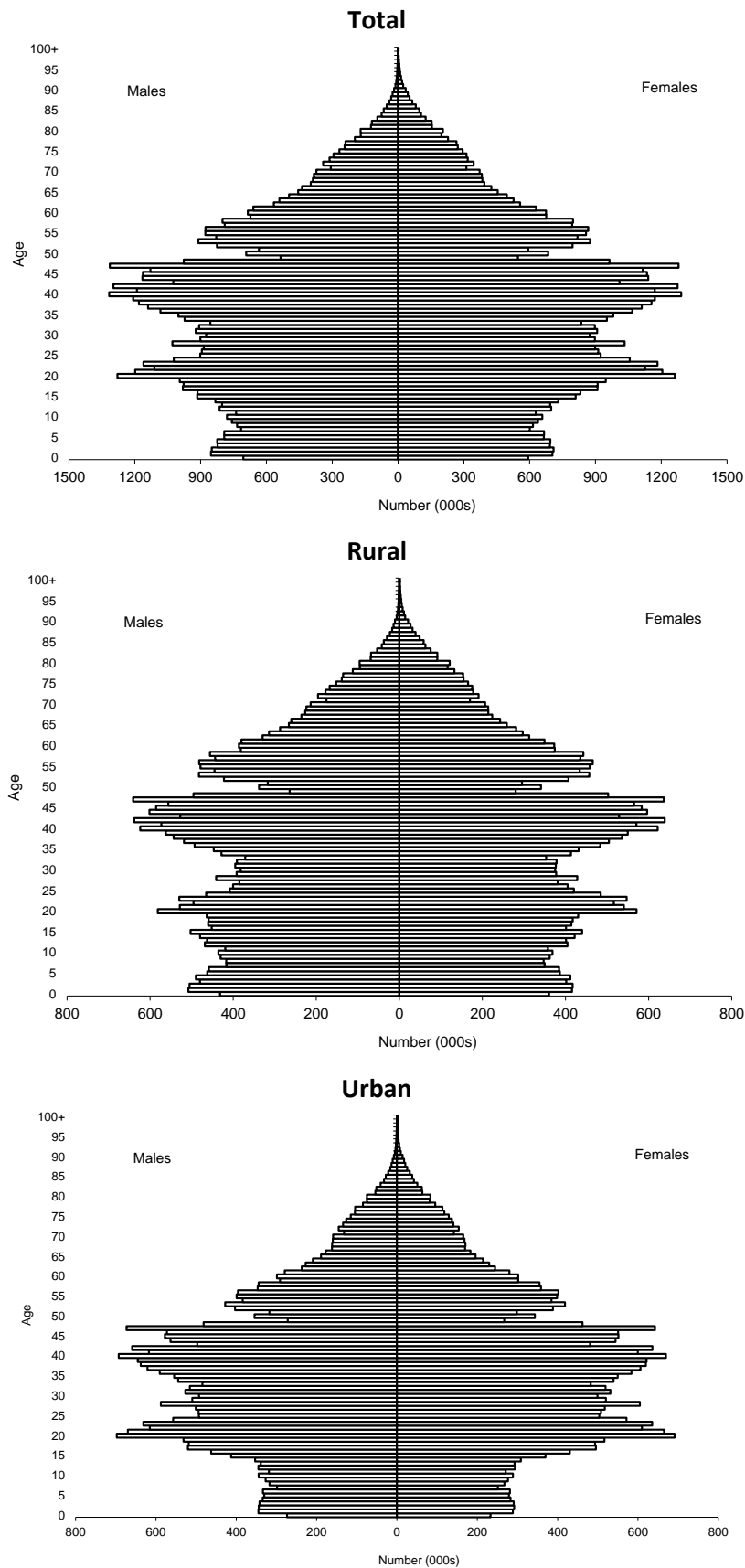
Table 3: **Major Indicators of China's Demographic Transition**
Source: Wang, 2011, 174

Indicator	1950	1970	1980	1990	2000	2005	2010-11	
Population size (millions)	552.0	829.9	987.1	1143.3	1265.8	1307.6	1347.6	
Birth rate (per thousand)	37	33.4	18.2	21.1	14.0	12.4	12.2	
Death rate (per thousand)	18	7.6	6.3	6.7	6.5	6.5	6.9	
Natural increase (per thousand)	19	25.8	11.9	14.4	7.6	5.9	5.3	
Total fertility rate	5.8	5.8	2.3	2.3	1.6	1.5	1.5	
Life expectancy, female (years)	45.6	63.2	69.3	70.5	73.3	74.5	75.6	
Life expectancy, male (years)	42.2	61	66.4	66.8	69.6	70.7	72.1	
Infant mortality rate, female	130.2	48.6	33.7	33.5	33.8	22.3	12.8	(2013)
Infant mortality rate, male	145.9	54.2	35.6	32.4	23.9	18.5		
Illiteracy (% of population at ages 15+)			22.8	15.9	9.0	7.9	4.9	(2012)
Percent urban	11.2	17.4	19.4	26.4	36.2	43.0	54.0	(2014)
GDP per capita (RMB yuan)	119	275	463	1644	7858	14065	43049	

Figure 10: **Paths to Rising Life Expectancy: China and Selected Other Countries, 1850-2000**
Source: Wang, 2011, 174
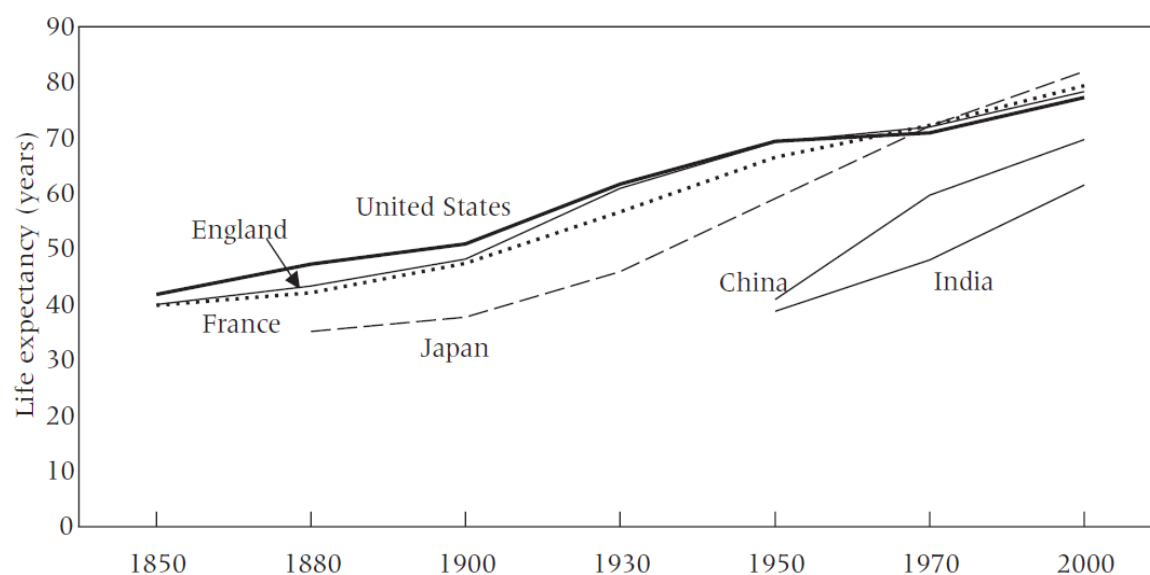
'In 2000, whereas the gap in income level between China and the United States was still around 1:10, female life expectancy in China was only about five years below the US level, about 75 versus 80. China thus completed its mortality decline while per capita income was at a very low level'.

This was achieved by dint of government led efforts in public health (Riley, 2004, 6). This greatly enhanced life expectancy is an important influence on food consumption patterns.

4.3   Ageing and Changing Age-Sex Structure

The trends in fertility and mortality discussed above have a preferred impact on influencing China's age composition. The age composition of a population has massive implications for demand for goods and services and is crucial in food consumption because:

- The amount of food consumed varies with age.

- The mix of types of food desired varies with age.

Hence a shift in age structure without any change in the total numbers of people can produce a massive change in the demand for food of a particular type. In this context an age-specific analysis of meat consumption and food preferences (including meat) for China is an urgent priority.

The exceptional 'demographic precocity' of China in achieving the transitions to low morality and low fertility in less than half the time of Euro-American countries has produced rapid and seismic changes in China's age structure.

Demographers use age-sex pyramids to depict the age-sex composition of populations. These simply are a series of horizontal layers with each layer representing successfully older age groups. National populations with high fertility (and high mortality) tend to have age-sex pyramids characterised by a pyramid shape with a wide base as was the case in China in 1960 (Figure 11). As mortality decline progresses the number in the older ages increases, while fertility decline sees an eroding of the base of the pyramid so that it begins to resemble more of a 'pillar' than a pyramid. This is evident in comparing the Chinese age pyramids in Figure 11.

In fact, the progression of mortality and fertility decline has followed a similar pattern in all countries although the spread of the transition varies. The regularity of the stages in the transition, however, has led demographers to develop demographic transition theory, a simplification of which is presented in Figure 12. The earliest stages of the transition involve low population growth because of high fertility being cancelled out by high mortality. As mortality begins to decline (and it tends to precede fertility decline), population growth is rapid because of the increasing gap between the number of births and deaths. However, as fertility declines, the rate of population growth falls until the final stages of the transition when both fertility and mortality are low so there is a return to the low population growth which characterised the beginning of the transition. It is important to recognise that age structures take a particular shape at each stage of the transition, moving from the 'pyramid' to 'pillar' formations.

A phenomenon which has been very important in China (and other Asian nations) and which was caused by the rapid fertility decline has created what been called the 'Asian Youth Bulge' (Fuller and Hoch, 1998). As Westley and Choe (2002, 57) point out, the 'youth bulge' …. 'is the result of a transition from high to low fertility about 15 years earlier. The youth bulge consists of large

numbers of adolescents and young adults who were born when fertility was high followed by declining numbers of children born after fertility declined'. The youth bulge is the final cohorts born

Figure 11:   China: Age and Sex Distribution of the Population, Actual 1970-2010 and Projected 2020

Source: United Nations, 2013a
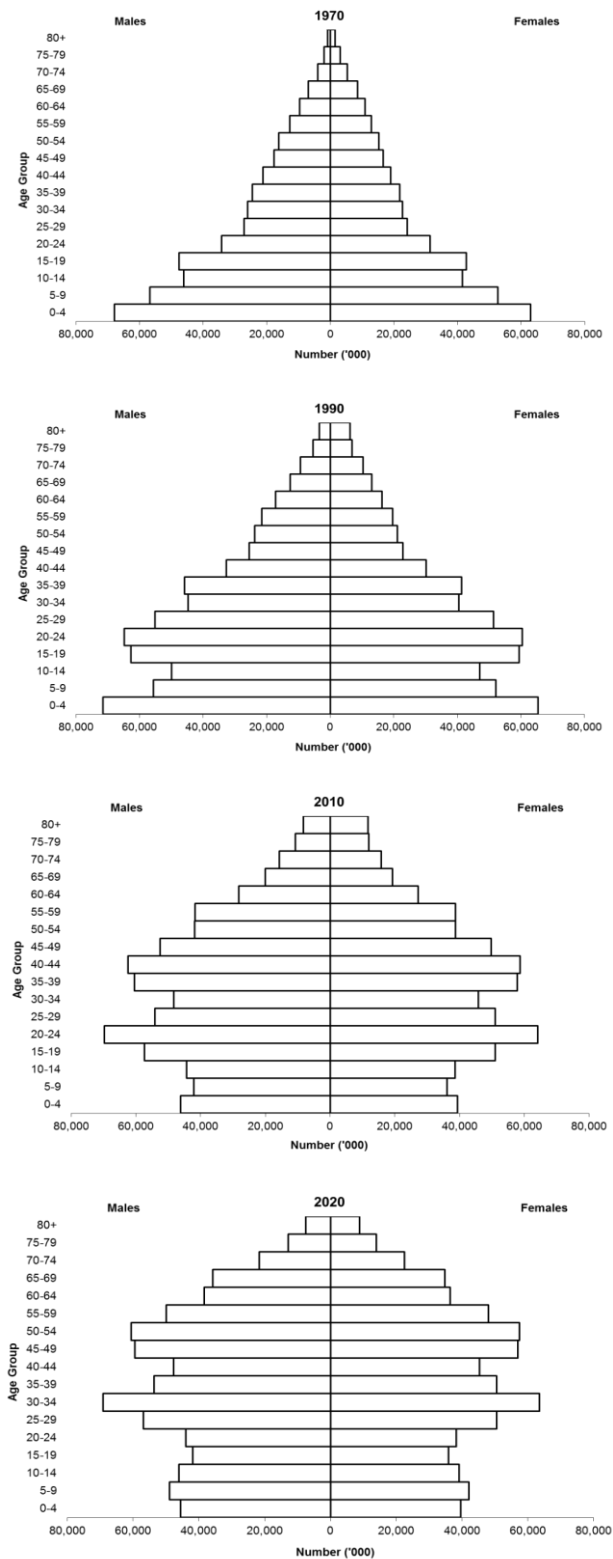
Figure 12:   **Simplified Model of the Demographic Transition**
Source: Hugo, 1981

Modernization and Time
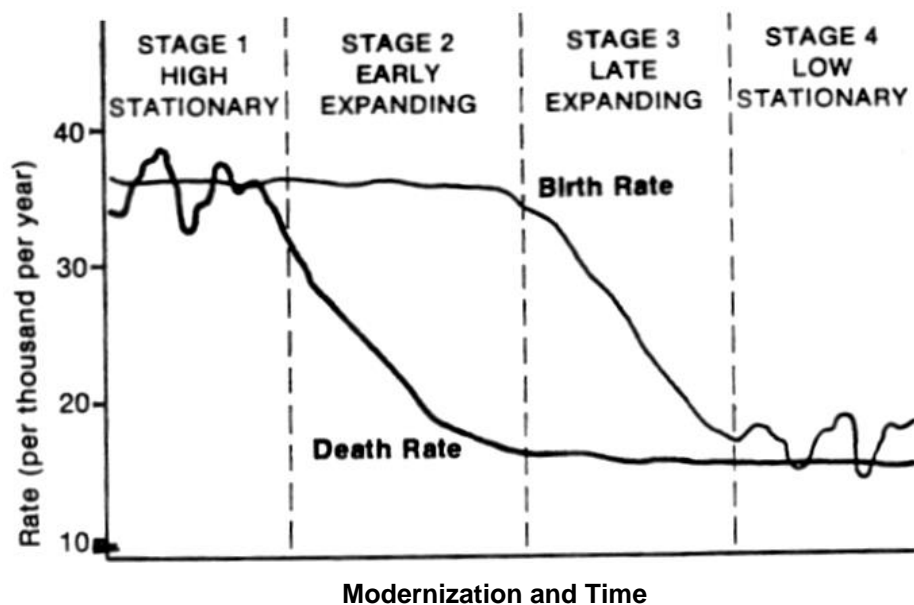
at a time of high fertility levels. Since they are followed by the much smaller numbers born during the low fertility regime, they create a 'bulge'. In the Australian context the Postwar Baby Boomer is such a group. In China the bulge phenomenon can be illustrated by looking at the growth of the young adult group (aged 15-24) over the period 1960 to 2040 in Table 4. The numbers in this age group grew rapidly from 105 million in 1960 to a peak level of 247 million in 1990. However, thereafter their numbers declined as the first babies born in the era of low fertility passed age 15.

Table 4:   **China: Population Aged 15 to 24, 1960-2010 and Projected 2020 and 2040**
Source: United Nations, 2013a

Year	Number ('000)	Percent	Annual Percentage Growth
1960	105,358	16.2	
1980	194,431	19.8	3.11
1985	233,156	21.9	3.7
1990	247,143	21.2	1.17
2000	202,869	15.8	-3.87
2010	242,244	17.8	3.61
2020	159,964	11.2	-4.07
2040	159,167	11.1	-0.02

Figure 13 overlays the 2010 age-sex structure of China with the projected structure of 2020 and the impact of undercutting is readily apparent. The 15-24 cohort in 2010 (25-34 in 2020) represent the last of the higher fertility cohorts. This will gradually move up the age pyramid as the century progresses. Inexorably the numbers in the older age groups will increase and those in the younger ages decrease.

Figure 13: **China: Age and Sex Structure of the Population, 2010 (Shaded) and 2020**
Source: United Nations, 2013a
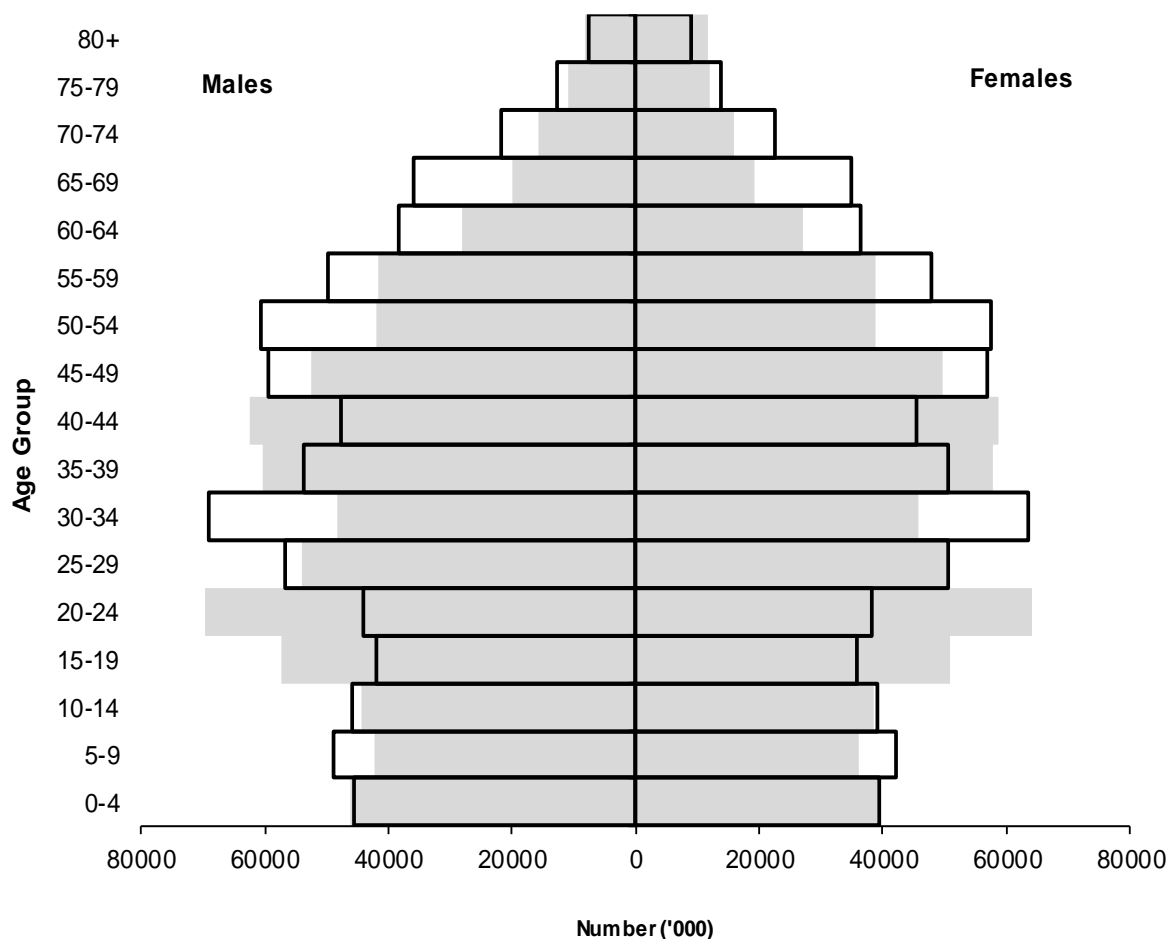
Of particular significance in Table 4, however, is the second column which shows the proportion that this key youth cohort makes up of the total population. In 1960 they represented 16.2 percent of the total community but under the effects of the 'youth bulge' this percentage increased to reach a maximum of 21.9 in 1990.

Xenos, Kabamalan and Westley (1999, 2) point out that the pattern of growth of the youth population varies with the peak and magnitude of fertility decline experienced by a nation … 'The youth bulge tends to be large in countries where fertility drops quickly from a very high to a very low

level, for instance in China. The speed of the transition also varies widely – from less than 20 years in Japan, Taiwan and South Korea to more than 50 years in the Philippines, where the youth share of the total population has remained near its peak of 20 percent for two decades.' In China, the youth population grew 2.5 times between 1950 and 1990, but in the Philippines, it grew by 3.3 times over the same period.

Some writers have defined 'youth bulge' as a situation in which at least 20 percent of a national population are aged 15-24 and a 'youth deficit' occurs when the proportion falls below 15 percent. This will occur in China in the current decade. Writers have ascribed particular problems to societies experiencing these bulges and deficits. On the one hand, countries experiencing youth bulges are considered to be more volatile since the large numbers of young people coming into the labour market may be frustrated by maintenance of the status quo and limitation of opportunities (Fuller and Hoch, 1998). On the other hand, where there are youth deficits there may be problems of labour shortage (Xenos, 2001).

The China youth bulge represents 'a 'boom' generation – a generation that is larger than those immediately before and after it – that is gradually working its way through nations' age structure' (Bloom, Canning and Sevilla, 2003, xii). The passage of this bulge through the age structure can produce a *'demographic dividend'* of economic growth when the bulge passes into the working age groups, and as a result, the workforce grows faster than the overall population. This increases the proportion of the national population within the working ages, and as Bloom, Canning and Sevilla (2003, xi) point out … 'assuming that policies to take advantage of this are in place. In fact the combined effect of this large working age population and health, family, labour, financial and human capital policies can effect virtuous cycles of wealth creation.'

China's demographic dividend was delivered primarily through three mechanisms (Bloom, Canning and Sevilla, 2003, 39):

- Labour supply – the numbers available to work are larger. Also women were more likely to enter the workforce as family size decreased, with the One-Child Policy.

- Savings – younger working age people tend to have a higher level of output and also a higher level of savings.

- Human capital investments – with smaller numbers of children and cultural changes there will be greater investment in education, health, etc. Hence, primary and secondary enrolment ratios are increased.

In China the demographic dividend associated with the youth bulge has been a major factor in China's economic growth 'miracle' of recent decades. Indeed, Wang and Mason (2008) estimate that between 20 and 25 percent of China's economic growth during this period is attributable purely

to the demographic dividend delivered by the favourable ratio of young productive working ages to dependent ages.

However, the demographic dividend of the youth bulge is of limited time duration and that time is running out. The proportion of China's population that is in the working ages (15-64) will peak in 2011 and will decrease thereafter except for a flattening in the mid 2020s (DaVanzo *et al.*, 2011, 22). Table 5 shows that the workforce age numbers will continue to grow in China but at a reduced rate. Moreover they will begin to decline in the 2020s. On the other hand, the 65+ population is growing rapidly and will more than double to reach 235 million in 2030.

Table 5: **China: Growth of the Population Aged 15-64 and 65 and Over, Actual 1970-2010 and Projected 2020-30**
Source: United Nations, 2013a

Year	Aged 15-64			Aged 65 and Over		
	Number ('000)	Percent Growth per Annum	15-64 as % of Total Population	Number ('000)	Percent Growth per Annum	65+ as % of Total Population
1970	454,242		55.8	32,161		3.9
1980	585,725	2.57	59.5	49,947	4.5	5.1
1990	756,644	2.59	64.9	67,320	3.03	5.8
2000	864,730	1.34	67.5	87,965	2.71	6.9
2010	999,569	1.46	73.5	113,545	2.59	8.4
2020	1,003,954	0.04	70.1	167,692	3.98	11.7
2030	987,570	-0.16	68	235,084	3.44	16.2

Demographers use dependency ratios to examine trends in the ratio of working ages (15-64) to dependent ages (less than 15 and 65+). The dependency ratio is decomposed into a youth dependency (under 15) and aged dependency. The dependency ratios for the 2000-31 period are shown in Figure 14. In 2010 there were 36.2 dependants for every 100 persons of working age and of these, 67 percent were aged under 15 and a third 65+. The reduced fertility has led to a decrease in the youth dependency and enhanced longevity has produced an increase in aged dependency. The latter will continue to increase and surpass youth dependency by 2029. The overall dependency rate for China has been falling but began increasing in 2012 due to the increased numbers aged 65+.

Wang (2011, 183) believes China has largely exhausted the demographic dividend. Figure 15 shows how the large birth cohorts of the 1960s and 1970s were at their peak productive ages at the time when economic growth and China took off but they are moving toward the less productive older working ages and eventually retirement. He argues that in the next year or so 'the growth rate

of net consumers will exceed that of net producers' (Wang, 2011, 183). This has significant implications for consumer demand.

Figure 14:   **China and India: Youth and Old-Age Dependency Ratios, 2000-35**
Source: DaVanzo *et al.*, 2011, 18
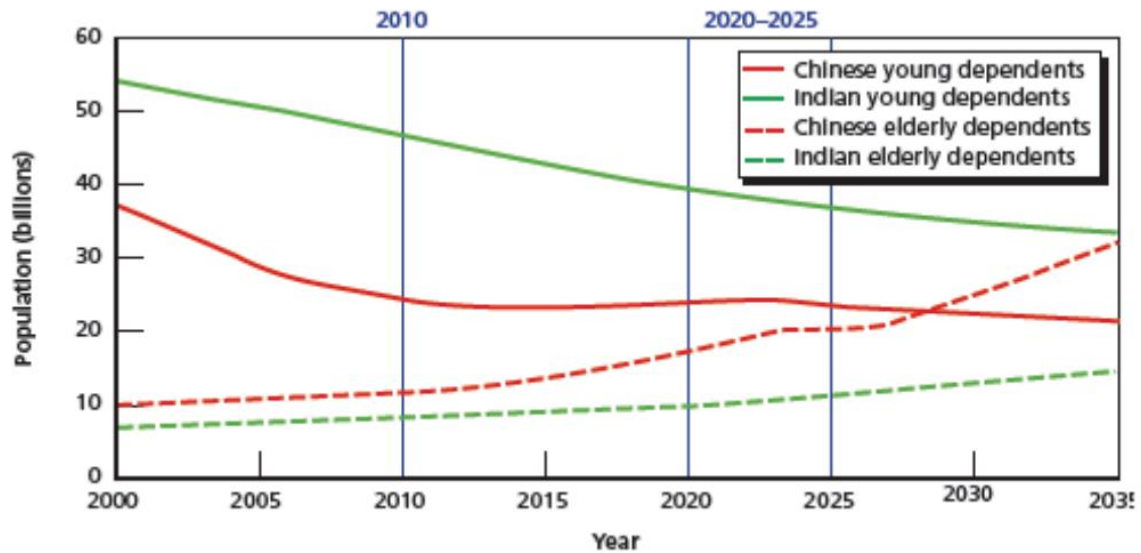
Figure 15:   **China: Population Age Structure, 1982, 2000, 2050**
Source: Wang, 2011, 184
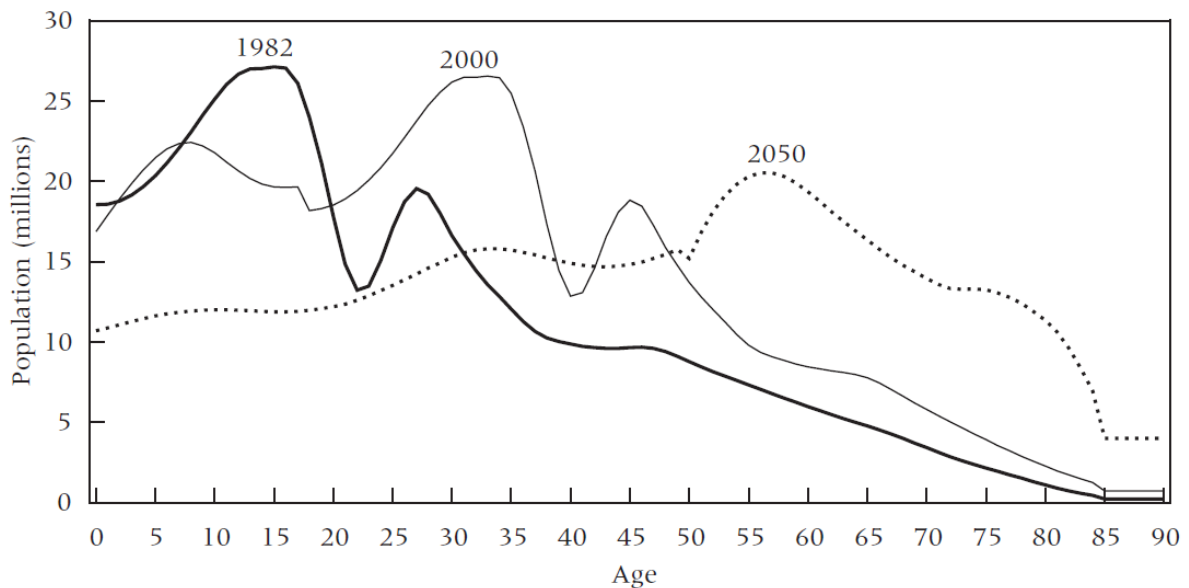
It should also be mentioned that in China there has been an increasing ratio of males to females (sex ratio) – the preference for sons in China together with decreased fertility. This has

been associated with sex selective abortion facilitated by the spread of ultrasound machines through the country and the One-Child Policy. The implications of the imbalances between males and females in the adult ages as shown in Table 6 are unclear. It is clear, however, that the dominance of males is increasing with each new cohort entering the adolescent years. Wang (2011, 185) pointed out:

> '… in part because of China's one-child policy, the sex ratio at birth in China has risen and stayed at an abnormal level of 120 boys per 100 girls or even higher in recent years, causing fears that as many as 20 million or more Chinese men will be life-long involuntary bachelors'.

Table 6: **China: Sex Ratio of the Population by Age, 2010**
Source: United Nations, 2013a

Age Group	Males	Females	Sex Ratio
	Number ('000)		
10-14	44,333	38,560	115.0
15-19	57,372	50,998	112.5
20-24	69,788	64,086	108.9
25-29	54,148	51,005	106.2
30-34	48,300	45,841	105.4
Total	273,942	250,490	109.4
Total Population	704,183	655,638	107.4

4.4 Changing Income Levels

One of the major debates over explaining increased meat consumption in China relates to the extent to which it is purely due to increased income levels and the extent to which it represents a change in food preferences in China (Dong and Fuller, 2007, 4). There can be no doubt, however, that income growth has played an important role. Examining the full effects of income growth is beyond the demographic focus of this study but it does represent one of the major changes in the characteristics of China's population in recent decades. Table 3 demonstrated the massive changes in GDP per capita over the last 60 years, especially since the beginnings of the open economy in the 1980s. However, Table 3 indicates the most spectacular growth has been since 2000.

A key feature of the income growth, however, has been increasing levels of income inequality. One of the dimensions here is between urban and rural areas with per capita income of urban residents being three times that of rural people (UNDP China and IUES, 2013, 35). However,

within urban areas there is also inequality, especially between residents and migrant workers and there are still 22.8 million urban workers who are so poor they are given a 'minimum living subsidy' (IDP, 2013, 36). The poverty of migrant workers has become of increasing concern.

The official estimate of the Gini Coefficient in 2012 was 0.474 compared with 0.35 in the early 1990s. Laurenceson (2013) points out this is worse than any OECD country and is almost certainly understated. Indeed, he suggests it could be as high as 0.61. Sicular (2013), however, argues that the increased inequality does not result from a deterioration of the incomes of poorer groups but due to the more rapidly increasing incomes of richer groups.

Figure 16 shows the growth of income of different deciles between 2002 and 2007 and it is clear that there is significant growth in the poorest declines, albeit not as great as in the better-off groups. This is supported by a decrease in the poverty rate in China from 19 percent in 2002 to 8 percent in 2007. However, the income gap widened between the richest and poorest deciles from 19:1 to 25:1.

Figure 16:   **Per Capita Household Income by Decile, 2002 and 2007**
Source: Sicular, 2013, 2
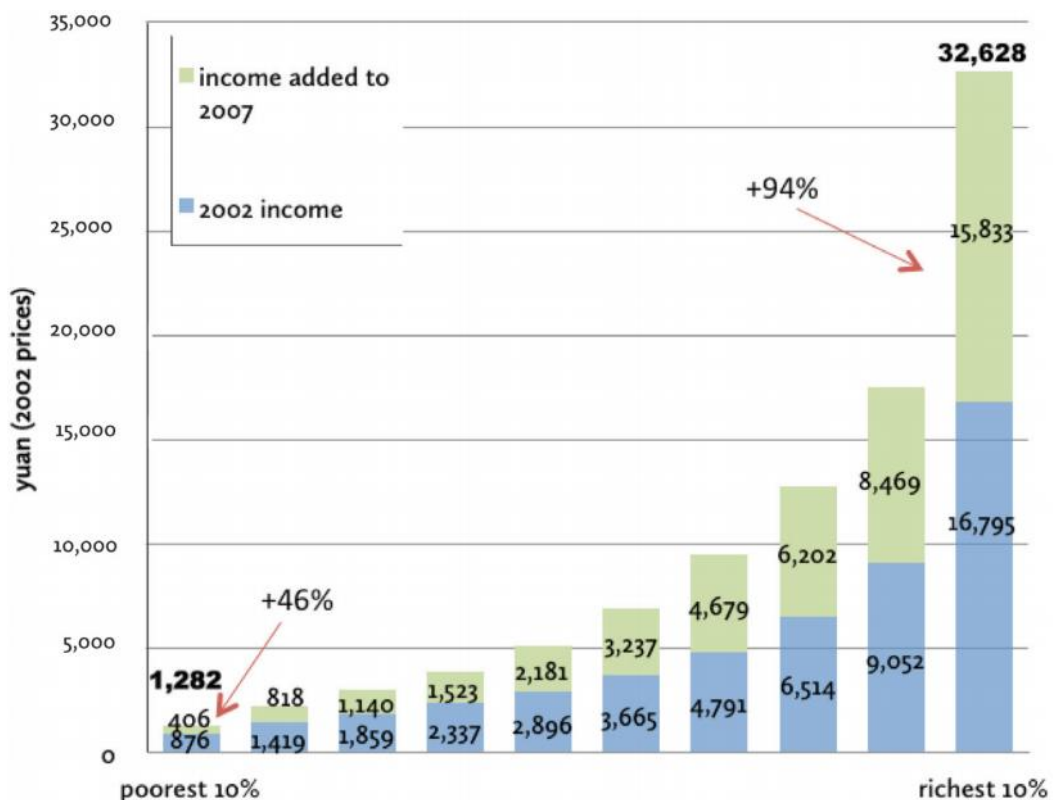
Sicular (2013, 2) also found that the income gap between urban and rural households has widened to become three times higher in 2002 and has subsequently remained above 3 as is shown

in Figure 17. He shows that the rural-urban income gap explained 45 percent to overall national income inequality in 2002 but 51 percent in 2007. The explanation for the differential lies in:

- The *'hukou'* system.
- Stagnant rural incomes – between 2002 and 2007 rural incomes grew annually by 7 percent but urban areas 11 percent.
- Differences in wages.
- Differences in human capital, educational opportunities and outcomes.
- Differences in non-age income (pensions, government transfer, returns on private assets).

Figure 17:   **China's Urban-Rural Income Ratio, 1985-2012**
Source: Sicular, 2013, 4
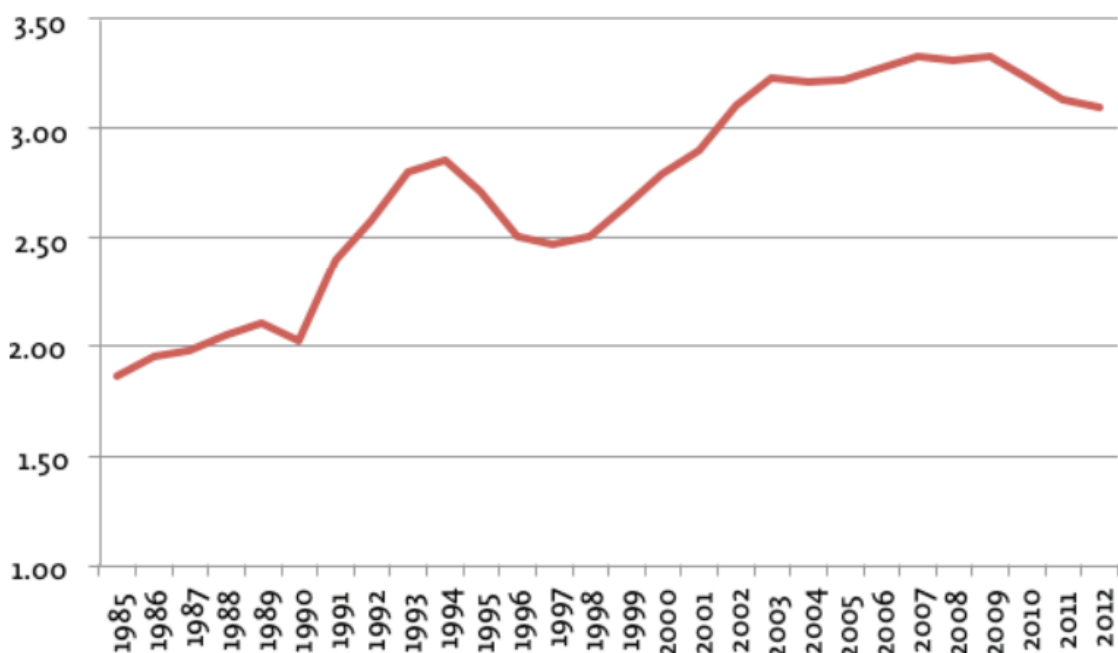
The urban-rural income gap has a regional dimension:

- Largest in western and eastern China (3.85 and 3.44 in 2007).
- Increases have been greatest in eastern China (43 percent in 2002-07).

Sicular (2013, 4) argues that increasingly the urban-rural inequality will be overshadowed by increasing inequality *within* urban areas:

> '… wherein the urban population is divided between the privileged, already established urban population, and a new urban underclass composed mainly of migrants and former rural residents'.

4.5   Changing Households and Families

Another element of population composition which is relevant for consideration of food consumption relates to the changing ways in which the Chinese are grouping themselves into families and households. It is often overlooked that for many products and services the basic unit of consumption is not the individual but the household and this applies to some extent to food consumption.   As the basic unit of social organisation in society, the family has undergone transformation in many nations in recent decades. In China the family has changed in response to a number of social, economic and demographic changes.

Figure 18:   Trend of Family Size in China, 1911-2010
Source: Yang, 2012, 3
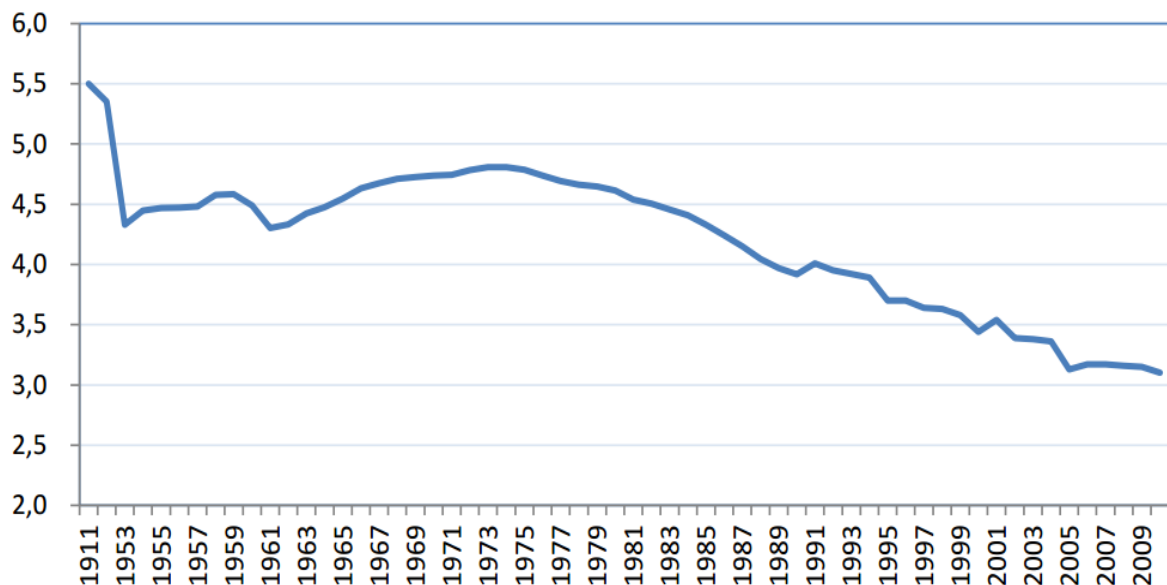
One of the most drastic changes has been in family size, as is evident in Figure 18.   In particular, it has been in more or less continuous reduction in size since the 1970s. Average family size fell for the first time below 5 in 1974 and 4 in 1990 to reach 3.4 in 2000 and 3.1 in 2010 (Yang, 2012, 3).   These shifts in family size are closely linked to the number of generations present in a family. Figure 19 indicates there have been some substantial changes in the mix of generations in families since 1930. The two-generation (usually parents and children) family has been dominant over the entire period but while it accounted for 68.3 percent of families in 1987, by 2010 it was reduced to 47.8 percent. Clearly this has been largely due to the increased significance of the one-generation family increasing from 2.5 percent in 1930 to 12.8 percent in 1990 but in 2010 was *more than a third* of families (34.2 percent). The latter is due to the lower fertility discussed earlier but

also the improvements in longevity with more surviving in the 'empty nest' years. However, it also reflects an increasing pattern of older persons retaining independent living situations longer than in the past. There is a dominant narrative about three-generation families being dominant in China but

Figure 19: **Trend of Number of Generations in the Family, 1930-2010**
Source: Yang, 2012, 4
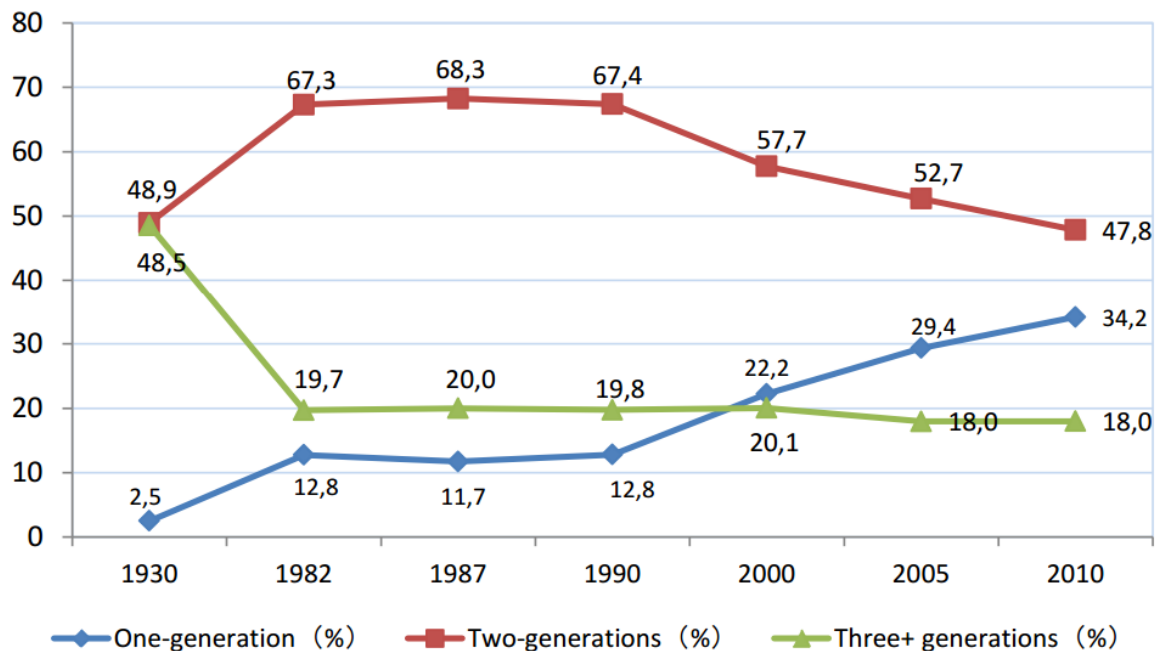
in 1930 they made up only 48.5 percent of the total. Nevertheless, the decline in their share has been dramatic – 19.7 in 1982 to 18 percent in 2010. Despite this it is important to note that nearly 1 in 5 households in China have three generations present. However, as Yang (2012, 4) points out:

> '… in the past thirty years, what has changed the most is not the decline of three-generation households, but the decrease of nuclear family and the increase of single-person family'.

The large increase in single-person households has important implications for consumption.

As in other societies, there have been some dramatic shifts in living arrangements in China. The Crude Divorce Rate in 2010 was 2 percent – a tenfold increase since 1978. Indeed, divorce and non-marital childbirth have produced an increase in single-parent families.

Population mobility has had a greater impact on families in China than in many nations. This especially applies to internal migration as is discussed in the next section. In 2010 there were 221 million internal migrants in China. Much of this is rural to urban migration and much of it involves separation of family members. As Yang (2012, 6) explains:

'In the 1980s and 1990s, migrants tended to be young and single, but more and more married people with children have joined the tidal wave of migration in the past decade. Various institutional and structural constraints render married migrants to leave spouse, children and parents …'.

In fact, such families at the 2000 census made up one in 5 Chinese families (20.1 percent) and there was an average size of 3.27 in the 70 million 'left behind' families.

It is also interesting to look at migrant family and living arrangements at the destination. Figure 20 shows that the most common form of living arrangement among migrants is living alone (27 percent) but another 23 percent are of the Single Parent and Children type, indicating significant separation of spouses by migration. Moreover in the households of migrants with children, only 63.6 percent have all of their children with them at the destination.

Figure 20: **Family Types of Migrant Family in China, 2011**
Source: Yang, 2012, 8
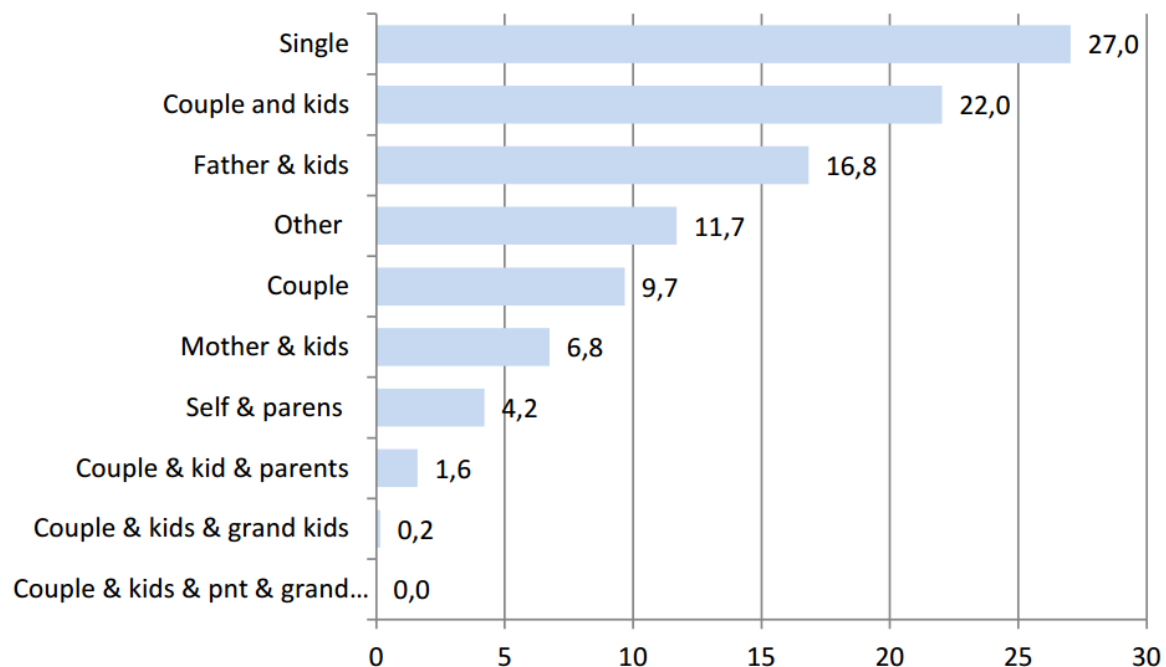
It is noticeable that there is increasing diversity in the living arrangements of families. Yang (2012, 9) has identified a number of trends:

- The proportion of families with children living with their grandparents only, but not parents, increased from 0.7 percent in1 990 to 2.9 percent in 2005.
- 'Empty Nest' families have increased.
- 'Double Income No Children' have appeared for the first time and are significant in cities.

- Some family types not lawfully recognised in China (cohabitation, homosexual families) have emerged.

In some she argues that Chinese families are displaying a combination of traditional, modern and post-modern characteristics. However, although reduced in size and increased in diversity the Chinese family is still the fundamental unit of social organisation and of consumption.

5. CHANGING PATTERNS OF MOBILITY AND SPATIAL DISTRIBUTION

5.1 Introduction

Migration is often neglected in analyses of China's demography but as Cai (2013, 392) points out:

'Internal migration has emerged as the single most important factor behind the rapid population redistribution in China. Mass population movement across the country not only alters population composition but also stimulates social, economic and cultural changes'.

From the perspective of analysing food consumption, patterns of population movement are of considerable significance for a number of reasons:

- The spatial distribution of demand – populations are not uniformly distributed across the national space so changes in the distribution of population, other things being equal, changes the distribution of demand.

- As suggested in the quotation above, migration can often be associated with changes in things other than location. It puts the migrant in a new context and new matrix of influences and can often involve a change in diet.

- In China, migration rarely involves a definitive relocation and severing of ties with the origin. It often separates families but even so, contact, visiting and communication with the origin is intensive so that the potential for these channels to include food or information about food is considerable. Indeed, they already do.

Accordingly, in this section we examine a number of relevant dimensions of changing patterns of mobility and migration among the Chinese population. At the outset, however, it is important to stress that, as both a cause and consequence of the rapid economic and social transformation since the early 1980s, there has been a parametric increase in personal mobility in China. While the stereotype that the Chinese were born, lived and died within a community, rarely travelling beyond it, has never been true. Personal mobility has reached unprecedented levels in

China. An illustration of this is given in Figure 21 which, although it only shows the number of Chinese travelling internationally, is illustrative of the steep increase in all forms of movement in China.

Figure 21: **Number of Chinese Travelling Abroad for Business and Tourism 1981-2003 and Total Number of Outbound Trips from China, 1997-2013**
Source: *Far Eastern Economic Review*, 24 June 2004, 30; *Asia Times Online*, 9 February 2006; Guangrui ,2012; Tourist Research Centre, Chinese Academy of Social Sciences
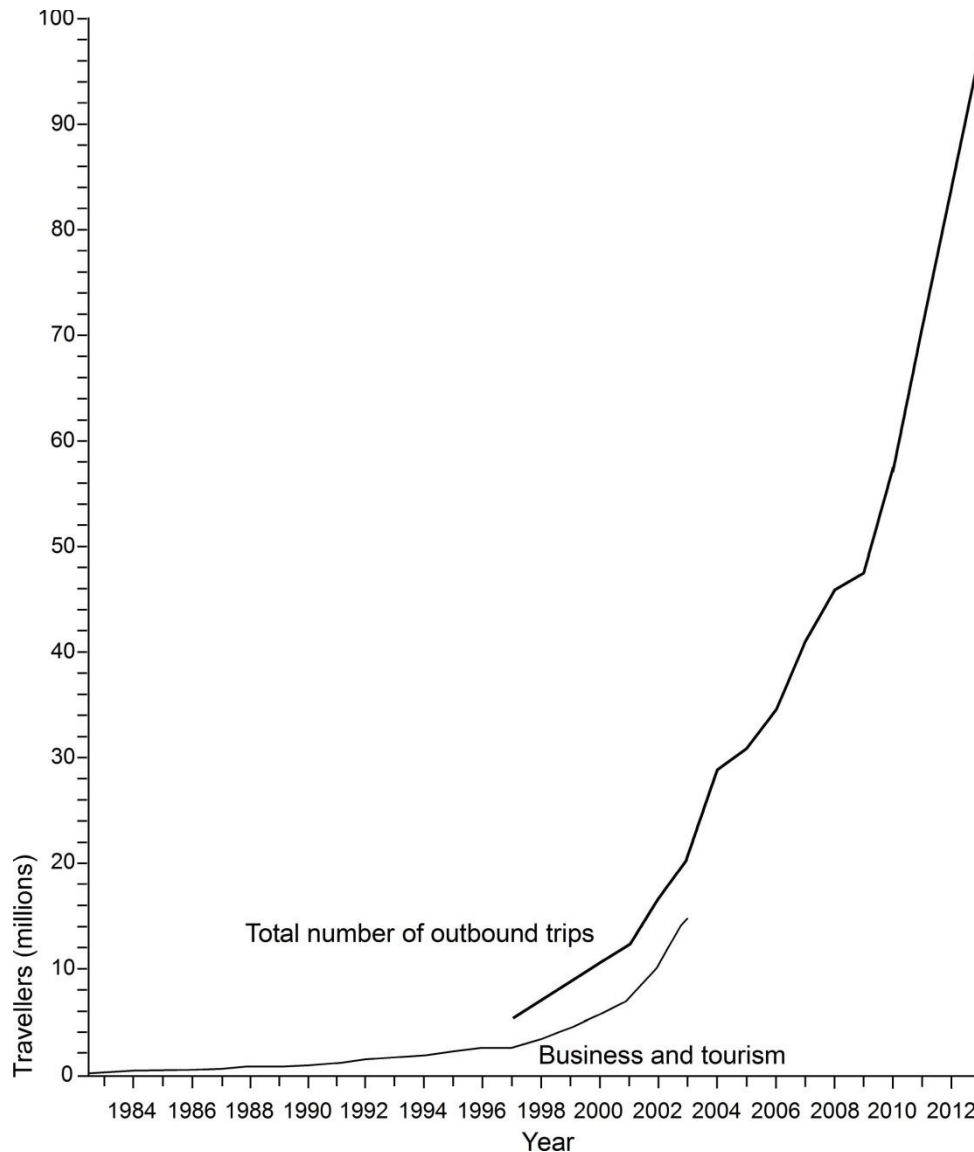
5.2 Internal Migration and Population Distribution

The major forms of population movement influencing, indeed transforming, China is rural to urban migration which is considered in some detail in a later part of this section. However, there are

also major differences between the provinces in the rates of population growth as is evident in Figure 22. Rapid growth is concentrated in 8 provinces in the heavily urbanised areas of the East Coast and in Western frontier provinces. The three fastest growing areas are the urban complexes of Beijing, Shanghai and Tianjin, and to a lesser extent, Guandong and Zhejiang. These are five areas accounted for 14 percent of China's total population in 2000 and 16 percent in 2010 but 55 percent of all intercensal population growth. The other three high growth provinces in the West are minority domiciled – Tibet (Xizang), Xingjiang and Ningxia.

Figure 22:   **China: Average Annual Population Growth by Province, 2000-10**
Source: Cai, 2013, 389

Cai (2013, 390) has decomposed the growth in the 8 provinces between net migration and natural increase in Table 7 and a sharp contrast is in evidence between the eastern and western provinces with net migration accounting for almost all growth in the east and little in the west where fertility rates have remained high.

The striking feature of Figure 22, however, is that 6 provinces experienced population declines between 2000 and 2010 – the first experienced since the famine of 1960. They are mostly

located in Central China and the decomposition of natural increase and net migration are shown in Table 8. It is striking that all had more births than deaths and increased their population through

Table 7: **China: Decomposition of Population Growth in the Eight Fastest-Growing Province-Level Units, 2000–10**
Source: Cai, 2013, 390

	Population (millions)		Population change (millions)	Average annual rate (%)	Natural increase (millions)	Net migration (millions)	Migration's share of change (%)
	2000	2010					
Beijing	13.82	19.61	5.79	3.5	0.29	5.50	95
Shanghai	16.74	23.02	6.28	3.2	0.20	6.08	97
Tianjin	10.01	12.94	2.93	2.6	0.19	2.73	93
Guangdong	86.42	104.30	17.88	1.9	6.74	11.15	62
Zhejiang	46.77	54.43	7.66	1.5	2.16	5.50	72
Xizang (Tibet)	2.62	3.00	0.38	1.4	0.31	0.07	19
Xinjiang	19.25	21.81	2.56	1.3	2.21	0.35	14
Ningxia	5.62	6.30	0.68	1.1	0.63	0.05	8

NOTE: Decomposition is calculated based on census data and annual birth and death rates provided in *China Statistical Yearbook* 2001–2011.

Table 8: **China: Negative Population Growth in Six Provinces, 2000-10**
Source: Cai, 2013, 391

Province	Population (millions)		Population change (millions)	Average annual rate (%)	Natural increase (millions)	Net migration (millions)
	2000	2010				
Gansu	25.6	25.6	−.04	−0.2	1.7	−1.7
Anhui	59.9	59.5	−.36	−0.6	3.9	−4.3
Guizhou	35.3	34.8	−.50	−1.4	3.1	−3.6
Sichuan	83.3	80.4	−2.87	−3.4	2.6	−5.5
Hubei	60.8	57.2	−3.04	−5.0	1.7	−4.7
Chongqing	30.9	28.9	−2.05	−6.6	1.0	−3.0

NOTE: Decomposition is calculated based on census data and annual birth and death rates provided in the *China Statistical Yearbook* 2001–11.

natural increase. However, outmigration was so much greater than inmigration that there was a total population decline. Net migration levels amounted to 22.8 million more migrants leaving the province than entering over the 2000-10 period. The exodus was greatest from Sichuan. Clearly these patterns reflect substantial regional inequalities in economic development.

6.   TEMPORARY MIGRATION AND THE FLOATING POPULATION

China has a household registration system *(hukou)*. All people are registered in their home area and it is very difficult to transfer *hukou*, especially from rural to large urban areas. When a citizen moves from one administrative region to another, the migrant is *not* entitled to the same rights and social services as a local citizen if the migration was not part of an official organised arrangement, even if the migrant has a permanent place of residence at the destination. Despite this, the migrant is actually recognised as an urban resident after they have stayed 6 months at the destination. This results in two categories of urban residents – those with an urban *hukou* and those known as the *floating population*. They are mainly from rural areas and don't enjoy the same rights as those with an urban *hukou* in voting rights, employment opportunities, education, medical care, social security and other social services. This is producing massive inequalities within urban areas, and in fact some local cities are modifying their policies in this area and there are calls to remove the inequality.

The numbers involved here are substantial. In 2008 migrant workers in China numbered 225 million, of whom 140 million worked in urban areas outside of their home communities (Jun, 2010, 3). This meant that migrant workers make up around 1 in 4 urban residents although the proportion is higher in some large cities. Moreover, those migrants make up a large part of the rapid population increase in China's cities. Tie (2010, 4) has indicated that 38.1 percent of the 420 million population increase in the PRC's urban population between 1978 and 2007 was accounted for by the influx of rural migrant workers. In 2006 a survey of 2,799 villagers by the Development Research Centre of the State Council found that 18.1 percent of all rural workers had migrated to do long term off-farm jobs.

Recent trends in the number of migrant workers are shown in Table 9. A recent UNDP China and IUES (2013, 10) report reported that there were 260 million urban residents in China who lacked urban registration *(hukou)* records.

Many commentators in China have emphasised the need for the migrant worker population to become permanent urban residents and for this duality in Chinese cities to be ended and migrant workers become integrated as settled city residents. These recommendations have considerable merit and it is a major need to remove the inequalities between the two groups of urban residents. However, research findings on circular migration not only in China (Zhu, 1998; Hugo *et al.*, 2009) but elsewhere (Hugo, 1982, 2009a) have indicated that a more nuanced policy toward circular migration would have greater dividends for economic development and poverty reduction. Nevertheless, at present there is a real division between these two categories of urban residents which influences consumption patterns.

Table 9:   **Rural Migrant Workers in China, 2008-13**
Source:

Category	Year					
	2008	2009	2010	2011	2012	2013
Total rural migrants (10,000 persons)	14041	14533	15335	15863	16336	16610
Partial household move	11182	11567	12264	12584	12961	13085
Entire household move	2859	2966	3071	3279	3375	3525
Local migrant workers	8501	8445	8888	9415	9925	10284
Total	22542	22978	24223	25278	26261	26894

Data source: Chinese National Bureau of Statistics. 2014. China's Rural-Urban Migrants Monitoring and Survey Report. Released 12 May.
http://www.stats.gov.cn/tjsj/zxfb/201405/t20140512_551585.html

Notes: 1. Rural labour migrants are defined (by Chinese National Bureau of Statistics) as labourers who have their household status (agricultural) registered in rural hometown, but work/live in areas beyond hometown for 6 months or over (or engage in non-agricultural activities in hometown).

2. Local migrant workers: those registered hukou in hometown and also work in non-agricultural sectors within their hometown.

3. Out-migrant workers: those that registered hukou in hometown but work in places beyond hometowns.

6.1   Urbanisation

One of the most salient features of not only China's demography but for understanding contemporary and forthcoming social and economic change in the country is urbanisation. One of the most profound transformations which has accompanied the massive economic growth since the 1980s, and which continues, is the transition from a dominantly rural society and economy to an urban one. Figure 23 charts the strong association between economic growth and urbanisation by comparing the level of urbanisation (proportion of the population living in urban areas) with the growth in GDP per capita since 1970. China has just passed the critical point of more than half of its population living in urban areas. While there are considerable difficulties in measuring what are urban and rural areas and Chinese definitions have varied over time, there can be no doubt that the rural to urban transition is occurring apace in China.

With the focus on the proportion of the population living in urban areas, we sometimes lose sight of the huge numbers of people involved. Figure 24 shows the dramatic shift in the balance of numbers of Chinese living in urban and rural contexts. Even between 1950 and 1975 there was greater growth of numbers in rural China than urban China. The enormity of the subsequent change between 1975 and 2010 is apparent in the diagram during which the rural population declined a little but the urban population quadrupled. Moreover projections see an acceleration of this process over the next two decades. Table 10 shows that between 1950 and 2010 the urban population of

China grew 10 times at an average annual rate of 4.75 percent. Moreover by 2030 the Chinese urban population will be approaching one billion and include 68.7 percent of the population. The decrease in fertility means that growth rates will be lower but still very high at an average 1.88 percent per annum.

Figure 23: **China: Percent of the Population Living in Urban Areas and GDP Per Capita, 1970-2014**
Source: United Nations, 2014; United Nations and World Bank on-line databases
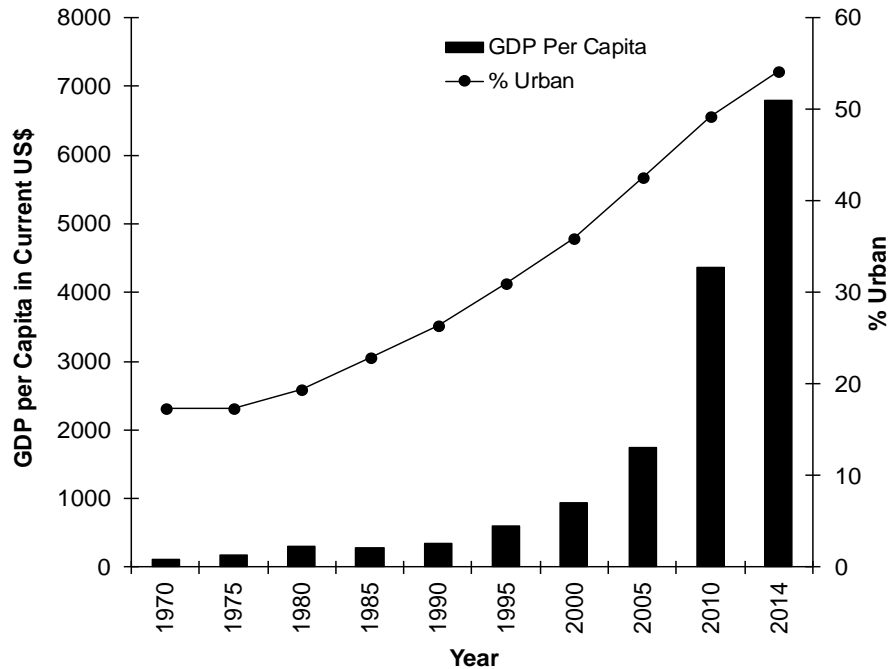
Figure 24: **China: Urban and Rural Population, 1950-2030**
Source: United Nations, 2012
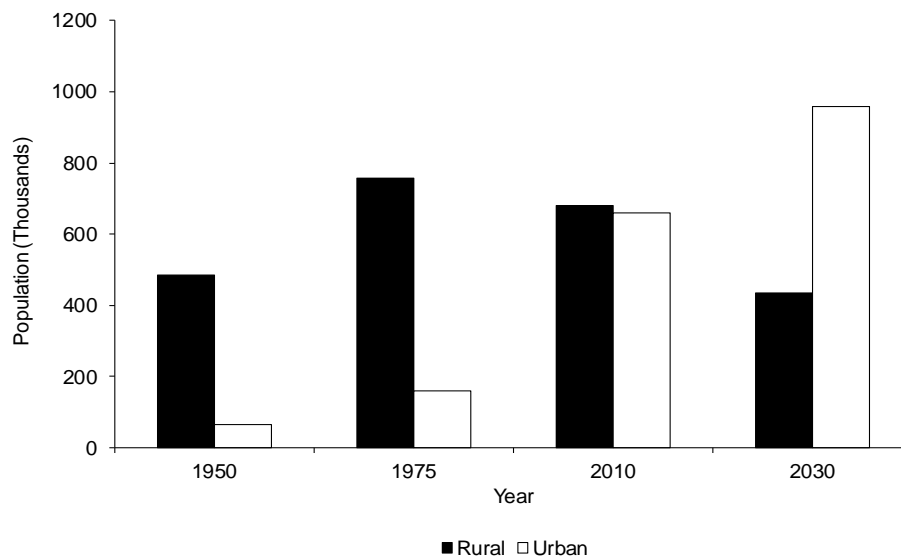
Table 10: **China: Urban Population, 1950-2030**
Source: United Nations, 2012

Year	Number ('000)	Percent	Growth per Annum
1950	65,006	11.8	
2010	660,283	49.2	4.75
2030	957,649	68.7	1.88

The other side of the rural to urban transition is the fact that much of the rapid urban growth has been caused by migration out of rural areas to cities. This has perhaps been the largest single migration in world history and has profound implications. It has already been demonstrated (Table 8) that net migration gain has been the major engine behind the growth of China's very large cities. China's rural population reached a peak in 1990 as Figure 25 shows. Since then there has been a consistent decline in China's rural population.

Figure 25: **China: Growth of the Urban and Rural Population, Actual 1980-2010 and Projected 2015-30**
Source: United Nations, 2014
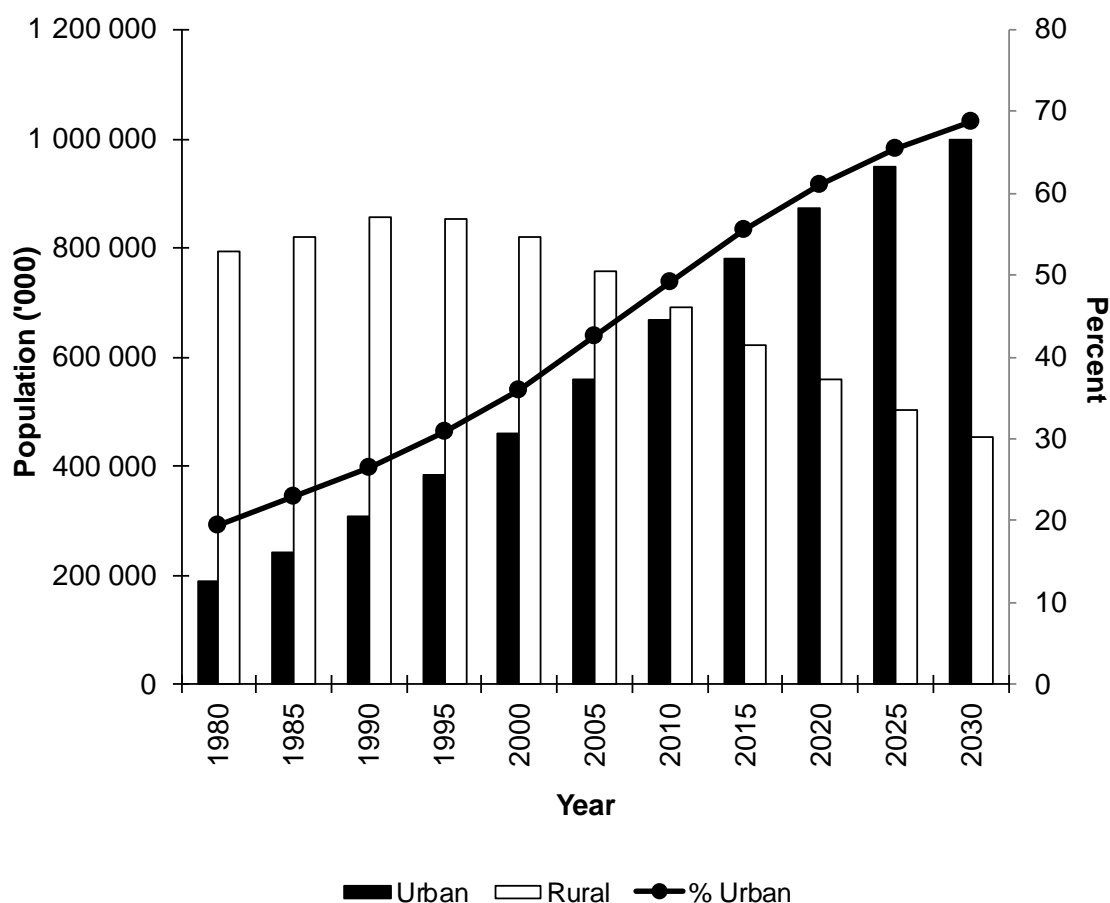
Rapid urbanisation in China has had a number of distinctive features. The *first* of these relates to the emergence of a number of megacities (cities with more than 10 million residents). Table 11 provides United Nations estimates and projections of megacities over the last 60 and next 15 years. While Chinese cities figure prominently in the table it must be stressed that several commentators have demonstrated that the UN estimates severely understate the actual populations of the large cities of the region. This undoubtedly is the case also for Chinese cities like Shenzhen, Chongqing and Guangzhou. These megacities are playing a major role in the development of Chinese countries and it is crucial that we develop better ways of delineating their boundaries so they represent the functional mega-urban areas.

Table 11: **Population of Urban Agglomerations with 10 Million Inhabitants or More, 1950, 1975, 2009 and 2025 (Millions)**
Source: United Nations, 2010, 6

	1950			1975	
Rank	Urban agglomeration	Population	Rank	Urban agglomeration	Population
1	New York-Newark, USA	12.3	1	Tokyo, Japan	26.6
2	Tokyo, Japan	11.3	2	New York-Newark, USA	15.9
			3	Ciudad de México (Mexico City), Mexico	10.7

	2009			2025	
Rank	Urban agglomeration	Population	Rank	Urban agglomeration	Population
1	Tokyo, Japan	36.5	1	Tokyo, Japan	37.1
2	Delhi, India	21.7	2	Delhi, India	28.6
3	São Paulo, Brazil	20.0	3	Mumbai (Bombay), India	25.8
4	Mumbai (Bombay), India	19.7	4	São Paulo, Brazil	21.7
5	Ciudad de México (Mexico City), Mexico	19.3	5	Dhaka, Bangladesh	20.9
6	New York-Newark, United States	19.3	6	Ciudad de México (Mexico City), Mexico	20.7
7	Shanghai, China	16.3	7	New York-Newark, United States	20.6
8	Kolkata (Calcutta), India	15.3	8	Kolkata (Calcutta), India	20.1
9	Dhaka, Bangladesh	14.3	9	Shanghai, China	20.0
10	Buenos Aires, Argentina	13.0	10	Karachi, Pakistan	18.7
11	Karachi, Pakistan	12.8	11	Lagos, Nigeria	15.8
12	Los Angeles-Long Beach-Santa Ana, United States	12.7	12	Kinshasa, Democratic Republic of the Congo	15.0
13	Beijing, China	12.2	13	Beijing, China	15.0
14	Rio de Janeiro, Brazil	11.8	14	Manila, Philippines	14.9
15	Manila, Philippines	11.4	15	Buenos Aires, Argentina	13.7
16	Osaka-Kobe, Japan	11.3	16	Los Angeles-Long Beach-Santa Ana, United States	13.7
17	Al-Qahirah (Cairo), Egypt	10.9	17	Al-Qahirah (Cairo), Egypt	13.5
18	Moskva (Moscow), Russian Federation	10.5	18	Rio de Janeiro, Brazil	12.7
19	Paris, France	10.4	19	Istanbul, Turkey	12.1
20	Istanbul, Turkey	10.4	20	Osaka-Kobe, Japan	11.4
21	Lagos, Nigeria	10.2	21	Shenzhen, China	11.1
			22	Chongqing, China	11.1
			23	Guangzhou, Guangdong, China	11.0
			24	Paris, France	10.9
			25	Jakarta, Indonesia	10.8
			26	Moskva (Moscow), Russian Federation	10.7
			27	Bogotá, Bolivia	10.5
			28	Lima, Peru	10.5
			29	Lahore, Pakistan	10.3

A second feature of rapid Chinese urbanisation relates to the distinctive spatial distribution of large urban areas. Figure 26 shows the distribution of all urban centres in Asia with 2 million inhabitants or more. In China there is a dramatic contrast between the east and west with only Urunchi among China's 2+ million cities being located in the western half of the country. Another aspect of this pattern is the strong coastal orientation in the location of large cities, especially megacities. This is partly a function of the strong colonial heritage of these large coastal port cities (McGee, 1965) but has important implications for the future, especially in the context of rising sea levels. Hugo (forthcoming) has demonstrated the substantial numbers of China's urban residents who live in areas vulnerable to inundation from storm surges and sea level rise. Indeed, Figure 27 shows that China has by far the largest urban population living in areas less than 10 metres below sea level in the world.

Figure 26: **Asia: Cities Over 2 Million in Size, 2010**
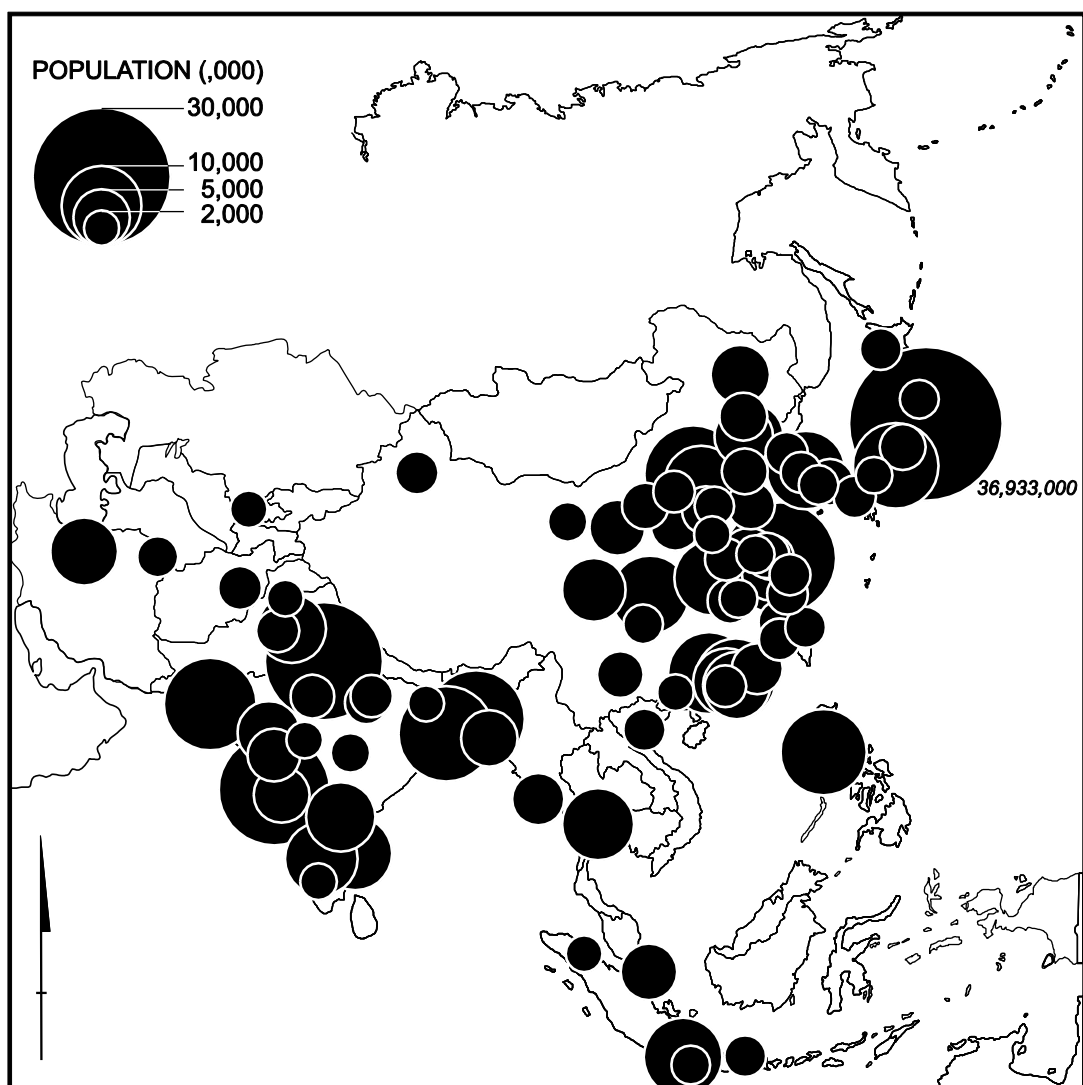Source: United Nations, 2012

Figure 27: **Countries with Largest Urban Populations Currently Living (2000) in Areas Less Than 10 Metres Below Sea Level**

Source: McGranahan *et al.*, 2007
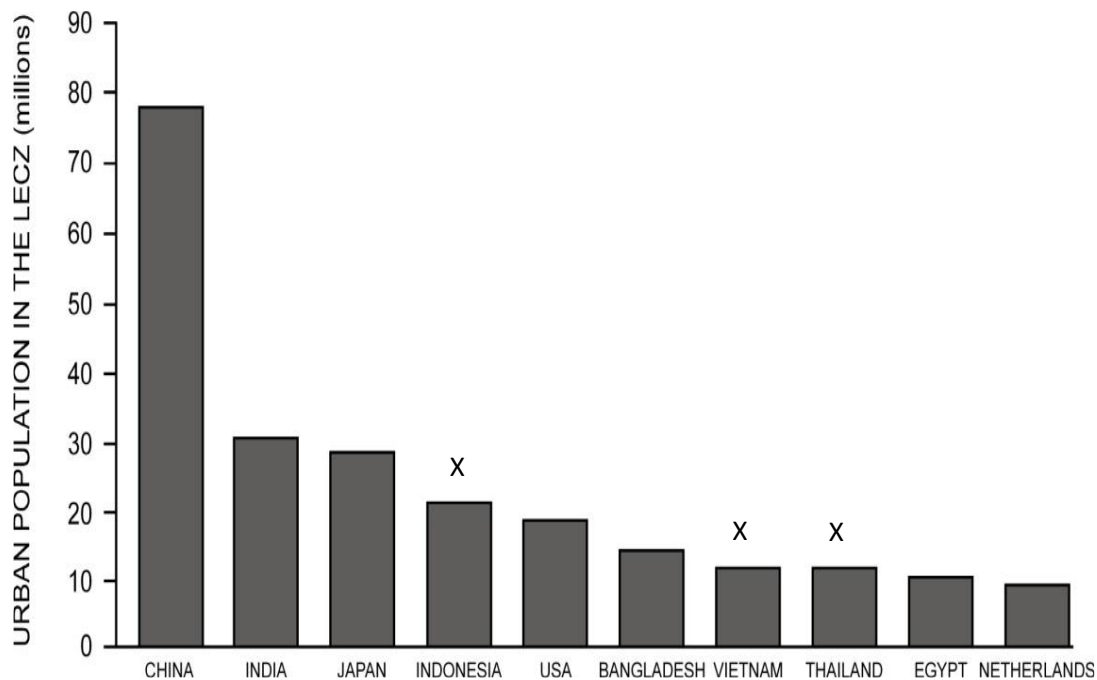
A third distinctive feature of China's urbanisation is the unprecedented rate of growth which some cities have experienced. Cities have literally arisen from the fields. One of the most remarkable examples is the City of Shenzhen. In 1980 it was a small regional centre with around 20,000 people. Currently the population living within its boundaries is around 12 million but it has overspilled those boundaries and probably is a functioning urban centre of around 18 million people. During the late 80s and 90s the Chinese government made it advantageous for local authorities to move their communities to higher administrative levels. Accordingly there was a massive increase in the numbers of towns and cities, as Figure 28 shows, with 316 new cities set up in the 1985-95 decade. McGranahan *et al.* (2014, 66) shows the land area covered by urban areas increased from 9,386 km to 22,439 km in 2000 and 40,058 km in 2010.

A fourth important characteristic was identified by Yu Zhu in 1998 as what he calls *'in situ urbanisation'* and involves the rapid lateral extension of cities swallowing up rural areas and smaller urban areas creating a highly differentiated pattern of land use and dynamic population change in extensive peri-urban areas surrounding China's major cities. These areas containing a diverse mix of urban and rural activities and rapidly changing populations. They usually extend well beyond the official boundaries of those urban areas but functionally they are an important part of these large cities.

Figure 28:   **Number of Established Towns and Cities in China, 1980-2011**
Source: McGranahan *et al.*, 2014, 66
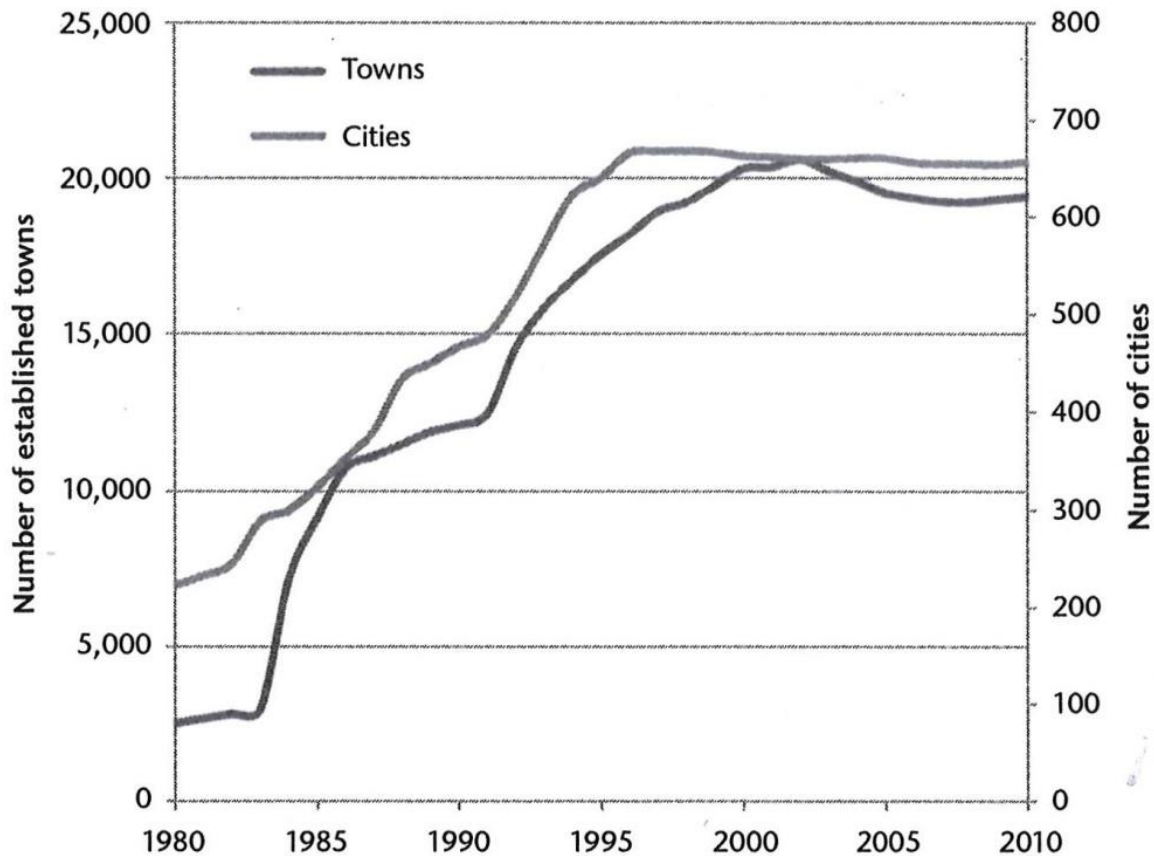
Another distinctive feature of Chinese cities is their increasing ethnic diversity. This derives partly from some inmigration of ethnic minorities from the west to the cities of eastern China but it also is including an increasing expatriate immigrant community. Figure 29 shows the origins of overseas-born people in China and indicates that there are large numbers of expatriates from Europe, North America and Oceania. These data greatly understate the size of the expatriate population in China. There are especially substantial numbers in the largest cities of the east. This is not only associated with substantial expansion of foreign companies into China but the rapidity of economic growth has meant that China cannot produce sufficient numbers of skilled people that the economy requires. Accordingly, China is now developing its own skilled migration program to bring in foreigners with specific skills, mostly for an extended temporary stay. From the perspective of the present paper they represent an important market segment for meat in China's large cities.

A sixth feature of China's contemporary urbanisation relates to age structure. As was shown earlier (Figure 8) that world fertility is low nationally in China (TFR = 1.18 in 2010!!), it is especially low in cities (0.88) and towns (1.15). It is interesting that cities like Shanghai and Beijing have had

extremely low TFRs (0.68 and 0.67 respectively in 2000) and in fact recorded a small increase in fertility by 2010 (0.74 and 0.71).   However, the fertility remains extremely low – a third of replacement level fertility!! This has resulted in ageing of the population being much more marked

Figure 29:   Origins of Immigrants in China, 2013
Source: United Nations, 2013b
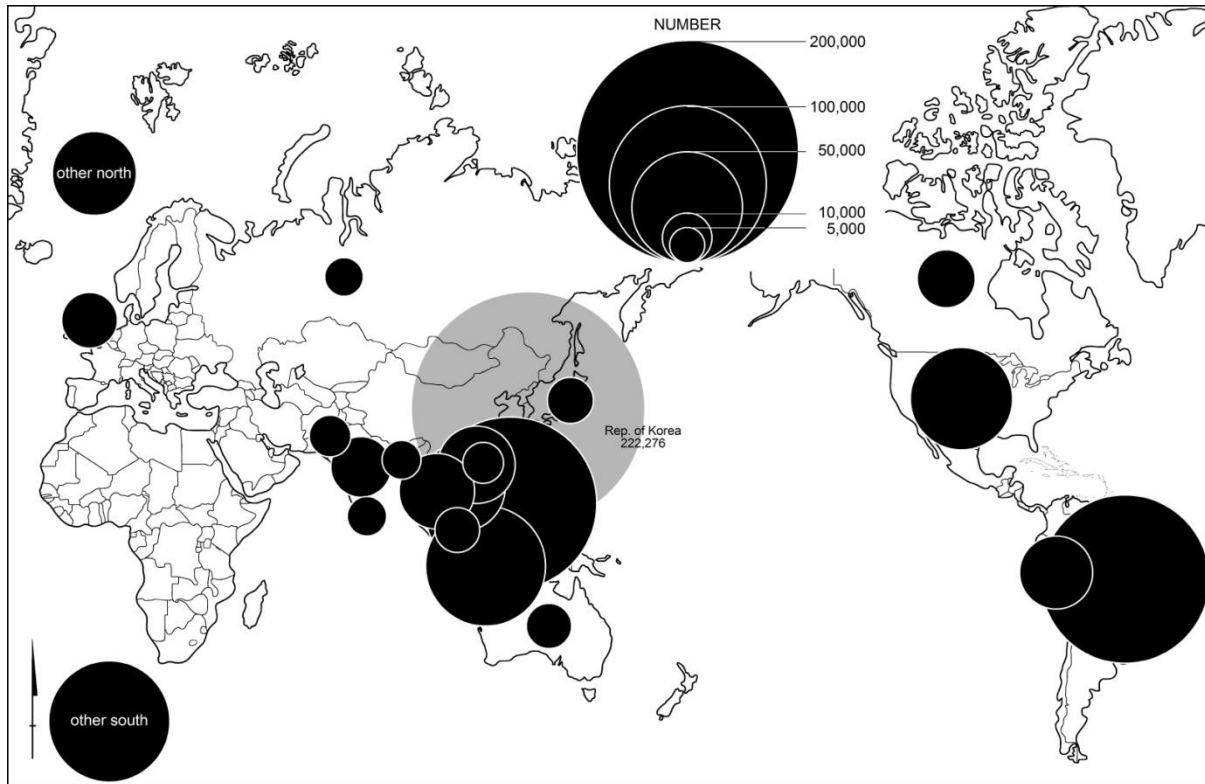
in urban areas than rural areas in China.   Figure 11 showed that while there has been an undercutting of the age pyramid for the total Chinese population and a reduced number of dependent age children due to low fertility, this has been much more marked among the urban population.

These rapid ageing trends are even more marked in China's largest cities. This is apparent in Table 12 which shows that in the three largest cities – Shanghai, Beijing and Tianjin the working age population has increased its share of the total proportion significantly between 1964 and 2010. This has been a tremendous 'demographic dividend' to these cities as a result of the larger proportions of the population being of productive ages. However in each case the proportion of the population in the dependent age groups has been slashed making up only 19.9 percent of Shanghai's population and 18.4 percent in Beijing. The undercutting of the Shanghai urban population is strikingly evident in Figure 30. Shanghai's age structure in fact is becoming comparable to that of OECD cities with

11.5 percent aged 65 or older in 2000 – well above the national average (7 percent). It was reported in 2001 that the city had 2.45 million retirees – making up 15 percent of the Shanghai population (*People's Daily*, 11 November 2001). Moreover Figure 30 shows that there were huge numbers in the 40-54 age group in 2000 presaging a massive increase in the aged population in the 2020s. This represents a major challenge for the city. Indeed, fertility has fallen to such low levels in Shanghai that there are now more deaths than births so that there is in fact natural decrease.

Table 12: **The Change of Age Structure in China and in Three Large Chinese Cities (%)**
Source: Population Censuses in 1964, 1982, 1990, 2000 and 2010

Year	Shanghai			Beijing			Tianjin			China		
	0-14	15-64	65+	0-14	15-64	65+	0-14	15-64	65+	0-14	15-64	65+
1964	42.31	54.08	3.61	41.50	54.42	4.08				40.69	55.75	3.56
1982	18.15	74.25	7.60	22.12	72.24	5.64	24.24	70.22	5.54	33.59	61.50	4.91
1990	18.23	72.39	9.38	20.48	73.10	6..42	22.77	70.75	6.48	27.69	66.74	5.57
2000	12.26	76.28	11.46	13.59	77.99	8.42	16.76	74.83	8.41	22.89	70.15	6.96
2010	8.91	80.81	10.28	8.95	81.65	9.40	11.10	79.49	9.41	17.12	73.60	9.29

Note: Tianjin was a capital city of Hebei province in 1964.

Figure 30: **Shanghai: Age Sex Structure of Total Population, 2000 and 2010**
Source: China Censuses

2000 (shaded) and 2010
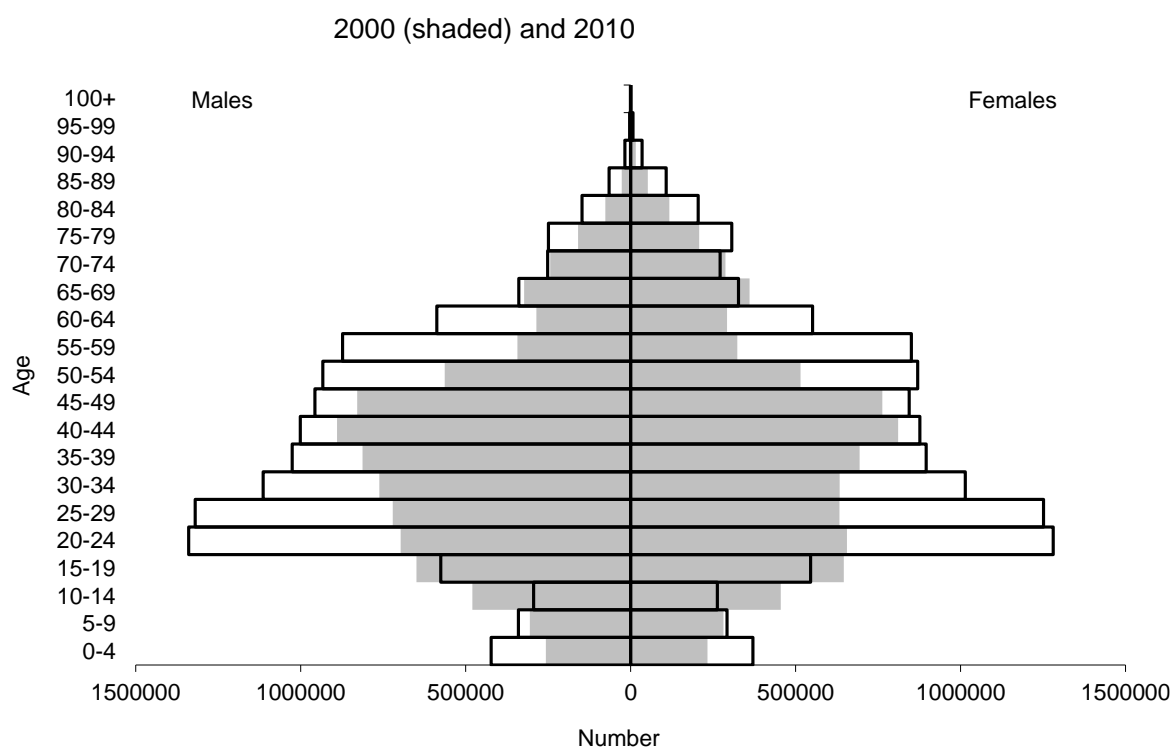
The comparison of the 2000 and 2010 Shanghai age-sex pyramids in Figure 30 shows that almost all growth of the population, and it was substantial, was in working ages. However, there was also rapid growth in the older working and early retirement ages, indicating the first impacts of ageing. The small increase in fertility is also reflected in a small growth of the 0-4 age group. Nevertheless, the undercutting of the age group indicating very small numbers coming through to the working ages in the next decade is evident.

The severe undercutting of the age pyramids of China's cities shown in Figure 11 and Figure 30 has huge implications for the future of the workforce of these cities. The much smaller numbers in the young dependent age groups than in the young adult age groups in 2000 and 2010 means that the numbers of urban residents moving into the school leaving age groups in those cities is dramatically declining. In Shanghai there are significantly more people coming into the retirement age groups than are moving into the school leaving age groups.

China has reaped a significant demographic dividend over the last two decades because the 'youth bulge' of large numbers of people born in the final years of high fertility moving into the working age groups at the same time as they were being followed by much smaller numbers of young dependants. Accordingly the workforce grows faster than the total population and countries who have appropriate policies can take advantage of this to create a 'virtuous cycle of wealth creation' (Hugo, 2009b) and this was amplified in urban areas compared with rural areas because young people moved from rural areas to cities. However, the effect of the demographic dividend was amplified in urban areas, so also will the effects of ageing be greater in urban areas due to the very low fertility. The deficits in the number of Chinese in the school leaving ages will be greater among urban residents than among rural residents.

What are the implications of this for future urban population growth? Low fertility and ageing populations of urban areas of China would indicate, that other things being equal, they will grow more slowly than the rural population. Nevertheless, as was shown earlier, China's urban population is projected to increase from 660 to 957 million between 2010 and 2030 (1.9 percent per annum) while the rural population will fall from 690 to 454 billion (an annual fall of -1.4 percent). Clearly these projections are predicated on the assumption that there will be a continuing and significant net gain of migrants in order to make up for the low fertility in their resident populations. Net migration gain is essential to the demographic, economic and social sustainability of Chinese cities. Indeed, it will be more important to the sustainability of Chinese cities than ever before. There will be a necessity for considerable 'replacement migration' to occur. This concept was developed in relation to the needs of low fertility European countries which currently or soon will experience population declines due to continued low fertility and the potential for countries of the

south to make up the shortfalls through international migration. It came to particular prominence in early 2000 when the United Nations Population Division (2000) published a report entitled 'Replacement Migration: Is it a Solution to Declining Aging Populations?'. They defined 'replacement migration' as 'the international migration that would be needed to offset declines in the size of population, the declines in the population of working age, as well as to offset the overall ageing of the population'. While this report attracted a great deal of comment and criticism the 'replacement migration' concept is a useful one because it points to the fact that migration will play a more significant role in the future than it has in the past. Migration from rural areas will be more important to China's cities than it has been in the past, not only to supply net increases in the demand for labour but also to replace the rapidly increasing numbers of workers born in the baby boom of the 1950-75 period, the oldest of which are beginning to retire.

Finally, earlier parts of this paper have drawn attention to a number of key characteristics of China's urban population including the following:

- There are large and widening differentials *within* urban areas and intra-urban inequality is an area of major concern.

- A large proportion of urban dwellers are 'floating population' and many are separated from their families that remain in rural areas.

6.2   International Migration

As was shown so graphically in Figure 21, one of the most rapidly increasing elements in China's demography is international migration. In estimating the components of China's population dynamics in the year 2010, DaVanzo *et al.* (2011, 4) estimated China to have a net emigration rate of .34 per 1,000 which seems low but is substantial. It can be interpreted as 34 more people leaving the nation per 100,000 in the population. Of course, China's large population means that substantial numbers are involved but DaVanzo *et al.*, (2011, 14) estimate that this net emigration rate is 10 times higher than indices in the same year (-0.03).

The United Nations publishes estimates of the numbers of overseas-born persons identified in country censuses which indicate the size of a country's diaspora, although it is a significant underestimate. Table 13 gives the totals recorded for China between 1990 and 2010. Not surprisingly, immigration is much smaller than emigration but it is interesting that both emigration and inmigration have more than doubled over the last two decades. Whilst it is important that these greatly understate Chinese international movement, as is attested by Figure 21, they do show some interesting patterns.

Table 13:   **China: In- and Out-Migrants, 1990-2013**
Source: United Nations, 2013b

	In	Out
1990	376,361	4,085,951
2000	508,034	5,493,899
2010	757,108	8,763,613
2013	848,511	9,342,485

Figure 31:   **World: China-Born by Country of Destination, 2013**
Source: United Nations, 2013b
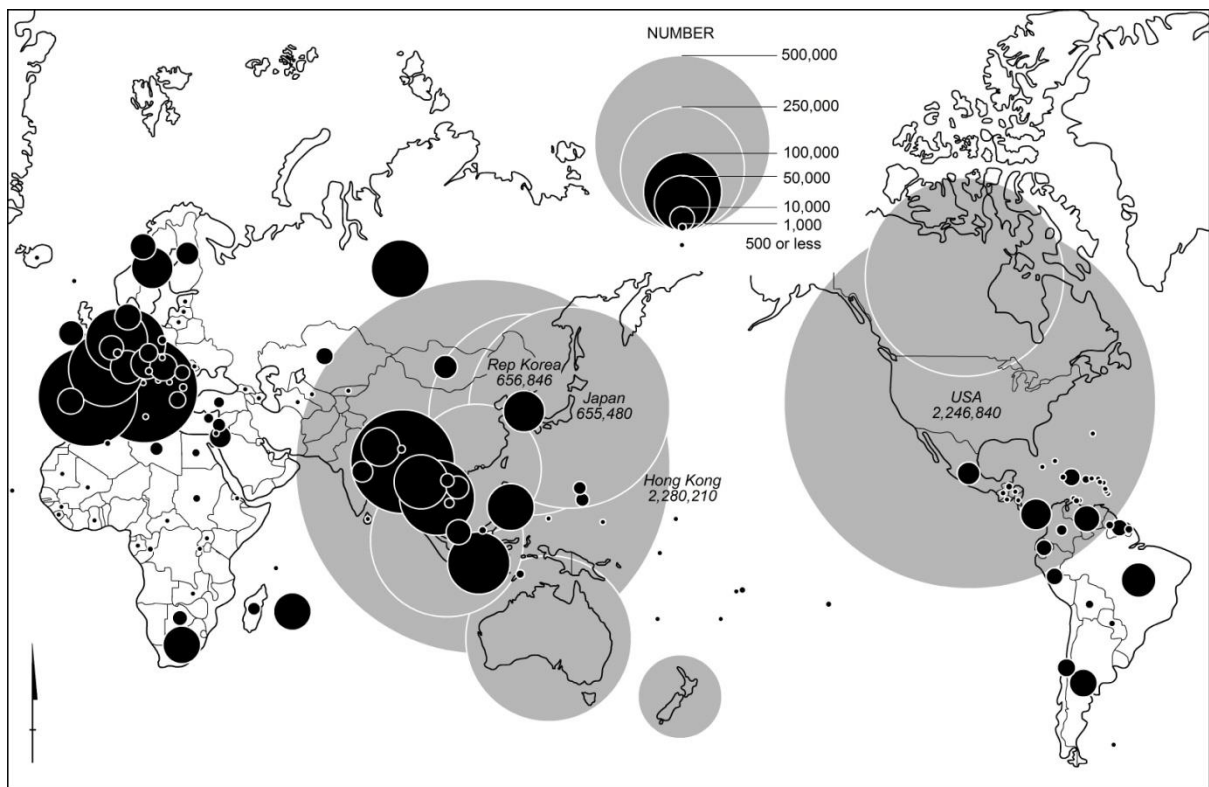
Figure 31 shows the distribution of Chinese overseas in 2013, although the large numbers of non-permanent and undocumented migrants would be under-included. It is striking that the diaspora is distributed very widely with the largest numbers being in neighbouring Hong Kong, Korea and Japan, although the US community is very large. Australia has the sixth largest country after the above countries and Canada. In 2013 the Australian China-born population was estimated by the ABS (2013) to be 427,590. This represents a rapid growth as is apparent from Figure 32. Indeed, at

the 2006 Australian population census they numbered 206,589 so there has been a subsequent doubling, making them one of the fastest growing birthplace groups in the nation. Moreover, the numbers in Figure 32 refer to those born in China and this represents only a part of the Australian Chinese population. It does not include:

Figure 32:   **Australia: China-Born Population, 1861-2013**
Source: Price *et al.*, 1984; Australian Censuses
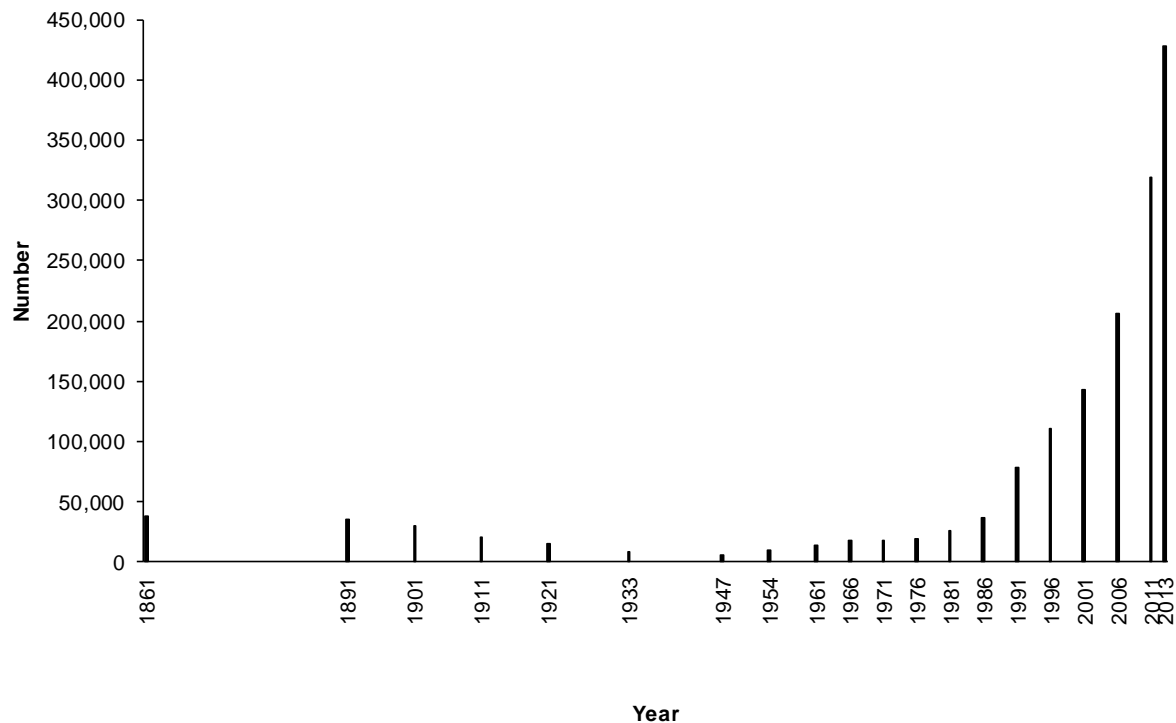
- The Australia-born children of Chinese settlers.

- Many non-permanent migrants. In 2014, DIBP estimated there were 1,142,560 temporarily present in Australia, of whom 157,070 were from China (DIBP, 2014).

- Many immigrants of Chinese ancestry in Australia are drawn from Chinese communities in other countries, especially Southeast Asia. Figure 33 overlays the age structure of the China-born (318,969 persons) and the Chinese ancestry (866,208 persons) populations in Australia at the 2011 Census. It is immediately apparent that the broader Australian Chinese ancestry population represents 4 percent of the nation and includes younger as well as older people.

Most people conceptualise the China-Australia migration relationship as being a traditional south-north displacement from a low income to a high income economy. However, this is certainly not the case. Analysis of the excellent and comprehensive migration data collected at the Australian borders have indicated that the reality is quite different. There are substantial movements in both

directions from China to Australia and Australia to China. This is evident in Figure 34 which shows the actual numbers of permanent, long term (a stay or absence of longer than one year) or short term (less than one year) movers in *both* directions. This is *not* a one way flow but a migration *system* characterised by return, circularity, reciprocity and intense movement in both directions.

Figure 33:   **Australia: Chinese Ancestry and China-Born by Age and Sex, 2011**
Source: ABS 2011 Census
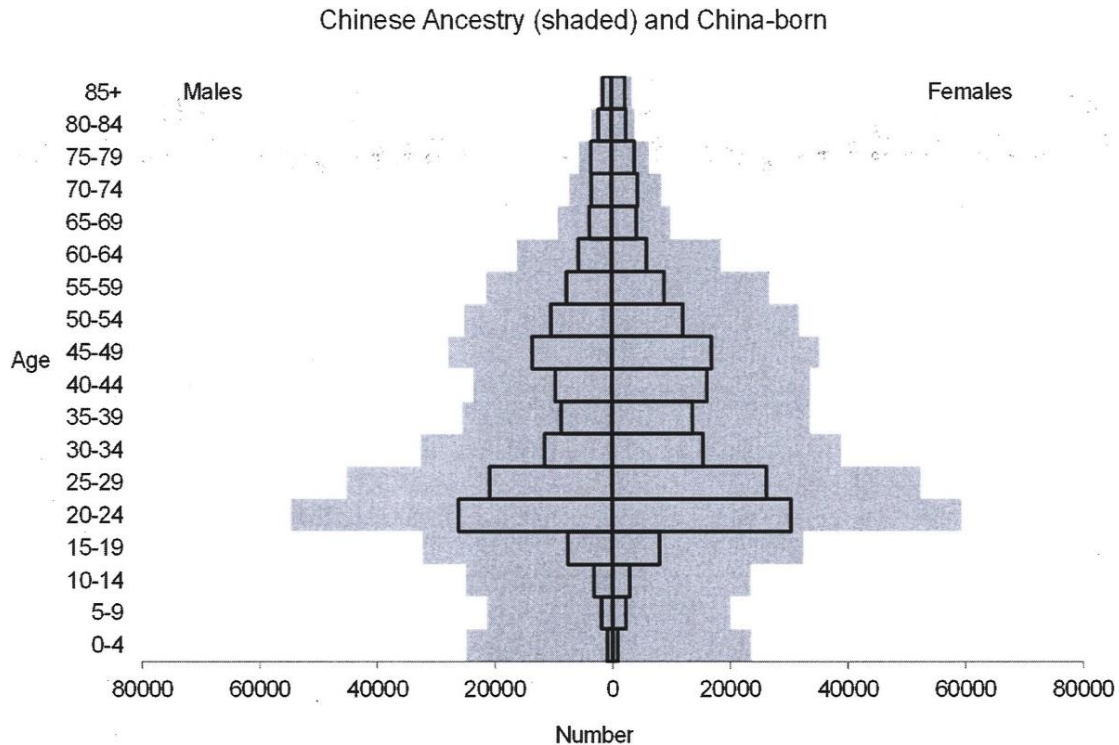
From the perspective of the present paper we need to draw attention to the fact not only that there is substantial migration, permanent and temporary, to Australia but also significant flows from Australia to China. Table 14 summarises the overall picture and Figure 34 shows how there has been a significant growth of migration to Australia from Australia in the last decade or so. It is useful to separate the various components of this reciprocal flow from Australia to China (Hugo, 2008).

- Return Migration – It is characteristic of immigrants to Australia of many East Asian countries that a high proportion return to their homeland (Hugo, 2008) after spending a number of years in Australia, often the years that their children are at school.

- *Circulation of Chinese Residents in Australia* back to China. It has been shown (Hugo, 2008) that an average Chinese resident who arrived in Australia before 1998 travelled home 6.2 times on average over the 1999-2006 period while those who arrived during that period travelled an average of 2.4 times.

Figure 34: **Australia: Permanent Arrivals and Departures of the China-born and Long and Short Term Movement To and From China, 1993-94 to 2012-13**
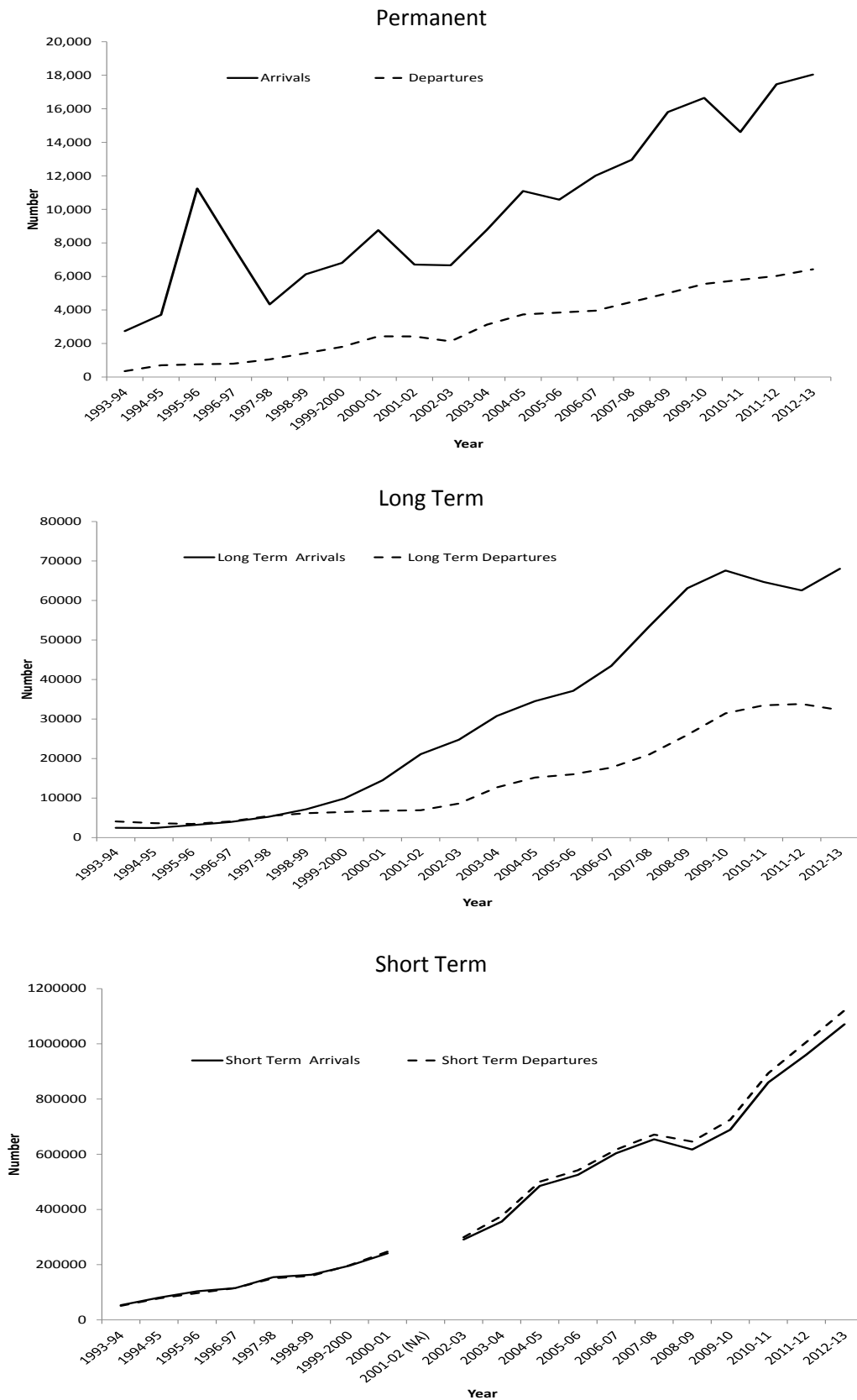
Source: DIBP, unpublished data

Permanent

Long Term

Short Term

Table 14:   **Movement Between China and Australia, 1993-2013**
Source: DIBP unpublished data

Type of Movement	Number
Permanent (1993-94 to 2012-13)	
Permanent Arrivals China-born	202,856
Permanent Departures to China	58,484
Overseas-born	45,032
Australia-born	13,452
Long Term Temporary Migrants with Chinese Citizenship	
Students at 31-3-14	89,779
Temporary Skilled Workers (457s) at 31-3-14	9,546
Number of Short Term Visits of the China-Born (average visits per person, 1998-2006)	
To China from Australia*	
Chinese immigrants (1998-2006)	2.4
Chinese immigrants (before 1998)	6.2
From China to Australia	
Return migrants from Australia	5.9
Other visitors	4.4

* In 1998, Australia introduced the Personal Identifier, so that individual movers could be detected. Hence those settling in Australia after 1998 were not resident in Australia for the entire study period (1998-2006) and so they would likely make fewer visits back to China. Those who settled in Australia before 1998 were resident for the entire study period and so could be expected to make more visits.

- Australians moving to work on a long term basis as expatriates in China.

- Australians travelling on a short term basis for business, work or tourism.

- Another group have been identified by Hugo (2008) as persons who are resident in China but circulate on a very frequent basis to Australia. These include some people who had previously settled in Australia, returned to China but retain intensive connections with Australia.

In the next section some of the implications for potential marketing of Australian red meat into China are explored. They arise from:

- The fast growing China-born community in Australia.

- The intensive coming in growing between China and Australia, much of it involving Australian Chinese community.

A final dimension of international migration which has already been discussed in the earlier section on population growth in China's dynamic urban areas – international immigrants moving to China. These include the following groups.

- Return migration of former emigrants and their descendants.

- Marriage migrants who met a Chinese citizen overseas and forged a partnership.

- Skilled migrants and business people – the rapid growth of China's economy has outpaced its ability to supply skilled workers to maximise its economic effects. This has led to substantial recruitment of skilled workers, not only from elsewhere in Asia but also in North America, Europe and Australia.

- There are the beginnings of implications of lower skilled international migration into labour starved cities in Southeastern China and Vietnam.

7. SOME IMPLICATIONS FOR MARKETING AUSTRALIAN RED MEAT IN CHINA

7.1 Introduction

Global meat consumption grew modestly in 2013, by 308.2 million metric tons – 1.4 percent over 2012 levels (FAO, 2013, 42). However, the FAO has shown that the main increases in demand were in Developing countries (Figure 35) and this trend is anticipated to continue. They estimated that consumption in China would increase by (FAO, 2013, 44).

'… over 20 percent compared to 2012 levels – especially as some consumers switch from poultry to other meat, following an outbreak of avian influenza'.

Figure 35: Gains in Global Meat Trade in 2013
Source: FAO, 2013, 42
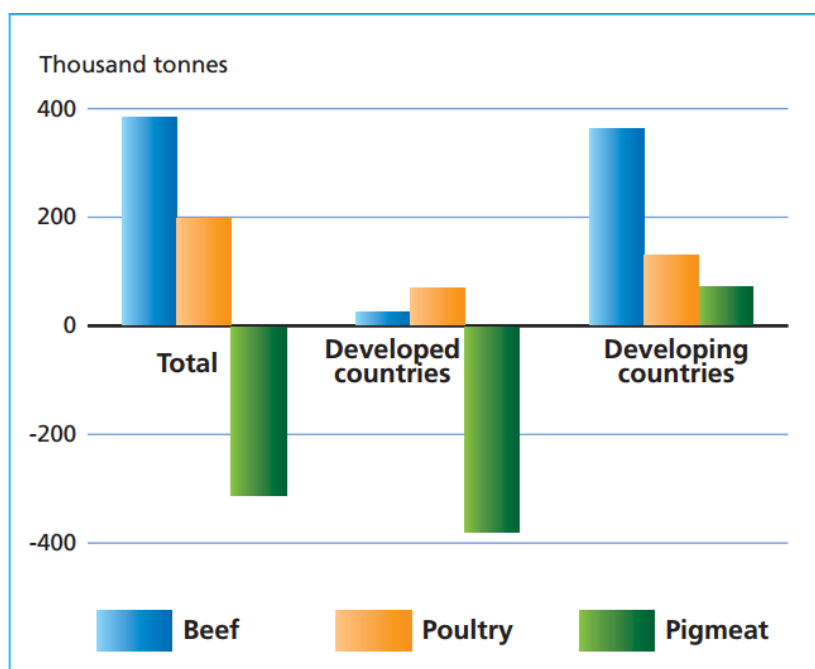
Clearly, China's dominance within Less Developed countries, both economically and demographically, means that it will be a significant part of this increased consumption. An authoritative Australian based analysis of changing food consumption trends in China (Zhou *et al.*, 2012, 1-2) has summarised the major changes in China which are reshaping food consumption trends as follows:

(1)   Demand is price-inelastic for most of the commonly consumed food items (that is, changes in the price of foods will not result in as large a change in food consumption).

(2)   There is a tendency to shift away from coarse grains to fine grains and in some regions, from rice to wheat consumption or vice versa as income increases.

(3)   Chinese consumers will consume more meats as their income increases.

(4)   Away-from-home food consumption is increasing as a result of changes in lifestyle and income.

(5)   Quality and safety of foods. Quality and food safety concerns can affect the demand of domestically produced foods and lead to the substitution of domestically produced food by imported foods.

(6)   Changes in supply chains. More advanced supply chains will make foods available in locations and at times that would have otherwise not been possible, particularly perishable foods. This also affects the quantity of food consumed.

(7)   Rural migration and urbanisation. Each year a large number of rural people move into the urban system, which results in changes in where foods are consumed. Composition of food consumption and manners of consumption (e.g., methods of cooking) will also change.

(8)   The ageing population. China's population is ageing and the absolute number of aged citizens is increasing rapidly. The demand for food, in terms of quantity, quality and variety, by older people is different from people of other age groups.

(9)   The tastes of younger consumers. Younger generations, with increased levels of education and more exposure to foreign cultures, tend to be more prepared to try foreign foods and the food consumption styles of other cultures.

(10)   Increasing demand for foods of premium quality. Increased disposable income coupled with small family size leads to increased demand for foods of premium quality. Foreigners in China (tourists and expatriates) also demand higher quality food.

It will be noted that one of these trends is the increased consumption of meat and the significance attributed to demographic factors in changing patterns of food consumption. In this final section we will summarise the findings of the preceding parts of this paper and what we believe it means for potential selling of Australian red meat into china. We also believe there are a number

of elements which have emerged from this study which, although not included in the 10 elements listed above, may have relevance to the consumption of Australian beef in China. It is clear that some commentaries on food consumption in China have been blindsided by the rapidity of change. As Zhou *et al.* (2012, 1-2) point out:

> '… the findings of earlier studies may be somewhat "outdated". In recent years, food consumption has experienced some rapid changes, driven chiefly by increased consumer income. As such, researchers have argued that parameters derived using "old" data is less adequate for understanding China's *current* food consumption and new estimates using more recent data is essential'.

7.2 The 'Growth' Factor

It is apparent that the massive scale of China's population means that it is a potentially huge market for most foods. This paper has shown, however, that the population is *not* growing rapidly and in fact is likely to begin to decline in the 2020s. The key issue is *not* population growth but the huge gap in the patterns of food consumption between:

- Urban and rural residents
- Rich and poor

The really salient issue is the massive increase in income levels demonstrated earlier. While there are major concerns that these rapidly increasing average income levels disguise one of the world's most unequal income distributions, there can be no doubt that the numbers in the 'consuming' class are increasing exponentially. Accordingly, the numbers of Chinese consumers who can afford to eat red meat on a regular basis is also increasing exponentially. The key question, then, becomes the extent to which they will change their food preferences and diet to include meat. There are a number of factors which need to be considered in targeting these new consumers.

The very low rates of consumption of red meat are from data collected only at the household level and include only meat consumed at home. Yet beef is perceived as a high end food and much is actually *consumed out of the home*. Hence beef consumption per head is in reality higher than is shown in the data so knowledge of, and preference for, meat may also be more widespread in China than the data indicate. There would seem to be two sets of implications which follow:

1. This needs to be put together with the evidence that Chinese are eating out more than ever before because:

- Culturally there is a major preference for socialising in public rather than at home so that eating out, albeit at very cheap roadside stalls, is a long tradition. Hence the massive success of malls in Asia.

- More are living in urban areas than ever before so that eating out is more a part of the lifestyle.

- Increased affluence and lifestyle changes.

Hence does it mean that by targeting the 'eating out' sector at lower and middle levels and not just the high end would be worthwhile since there is already substantial 'hidden' red meat consumption in China's eating out sector?

Recommendation One: Targeting the *Eating Out Sector* at all levels making sure not to restrict it to the luxury, high end.

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2. The very low consumption data relate to home cooked meals and should be seen as a potentially very large market, especially in urban areas. In the past people have certainly been put off including meat at home by high prices. However, there is another factor. Zhou *et al.*, (2012, 16) state that:

> 'Many Chinese consumers are reluctant to cook beef dishes at home due to their unfamiliarity …'.

Clearly, together with the significant cost, this is an important barrier to home consumption of beef.   Hence if Australian beef is to be marketed into the homes of China's new consuming class, there needs to be a concerted campaign to provide them with *information* about preparing beef in a culturally appropriate way. Showing how to use beef in locally traditional established dishes must be a central part of its marketing. This would be best done in a targeted concentrated way.

Recommendation Two: Marketing of Australian beef into China must be accompanied by a concerted campaign to inform and instruct home consumers in the preparation of beef, especially to incorporate in traditional dishes. This needs to be locally targeted.

7.3   The Inequality Factor

The image that Australian red meat has in China is very much as a luxury, high end food accessible only to the very rich or on very special occasions. This has led commentators like Zhou *et al.* (2012, ix) in their list of implications of change in China for Australian food exports to include the following:

'Imports of high quality beef and mutton/lamb are expected to increase to meet the demands of high-end hospitality industries, foreigners (expatriates and tourists), and wealthy local consumers. The quantity will be small.'

Clearly, if Australian meat exports continue to target the luxury, high end market there will continue to be growth in demand. However, we believe that there is much greater potential for Australia if we widen the target consumer group. It would seem appropriate to have a two pronged approach:

(a)   Protecting and expanding the market for premium high quality red meat.

(b)   Developing a wider market for less expensive meat products targeted at:

-       The wider Chinese consumers who have an increasing income but are not in the elite top decile of income earners.

-       A wider spectrum of the food distribution and eating out sector.

> **Recommendation Three:** Adopting a two prong approach of:
> (a) Protecting and enhancing the luxury, high end market.
> (b) Expanding the market with less expensive meat products to middle class consumers and a wider section of the food industry.

The income gap in China is widening to worrying dimensions and the top decile of income earners is clearly a substantial group who can be effectively targeted in the premium market. However, there would seem to be a market for less expensive cuts of meat which can be readily incorporated into so many traditional Chinese dishes.

7.4   Age Structure

Two of the 10 major trends shaping China's food consumption patterns identified by Zhou *et al.* (2012) involved China's dynamic age structure. Figure 36 shows the dramatic shifts which have occurred and are projected to occur, over the 1950-2050 period. The 'youth bulge' has had a massive effect on China's economic growth but now are moving into their 30s and represent an important new market. From the perspective of meat consumption there needs to be some detailed research on the different Chinese generations to ascertain the potential of each group for expanding meat consumption. The following groups need to be considered:

- Children – although the 0-14s are reducing in numbers, they are still large in number and culturally treasured. With the numbers of children being small, there is a 'child king' mentality with high rates of spending being focused on children.

- Youth among young adult population – 15-34. This is the first generation of Chinese to have grown up with full access to modern forms of communication and full exposure to foreign

food consumption styles. They also have grown up at a time of expanding affluence. They are most open to new foods.

Figure 36: China's Demographic Transformation in Age
Source: Lee *et al.*, 2013, 12
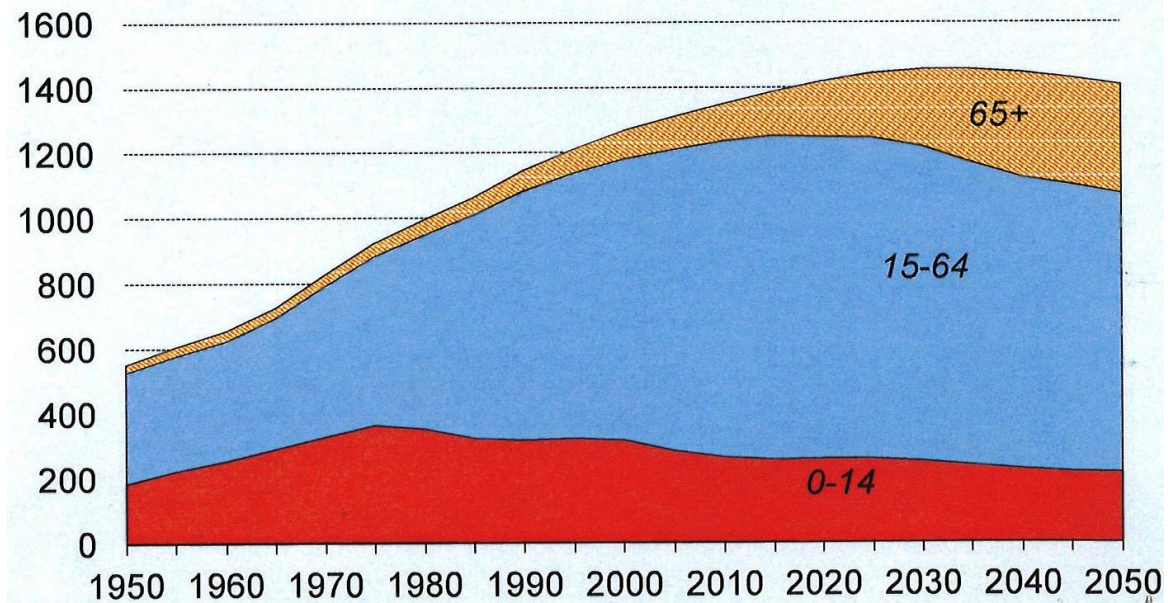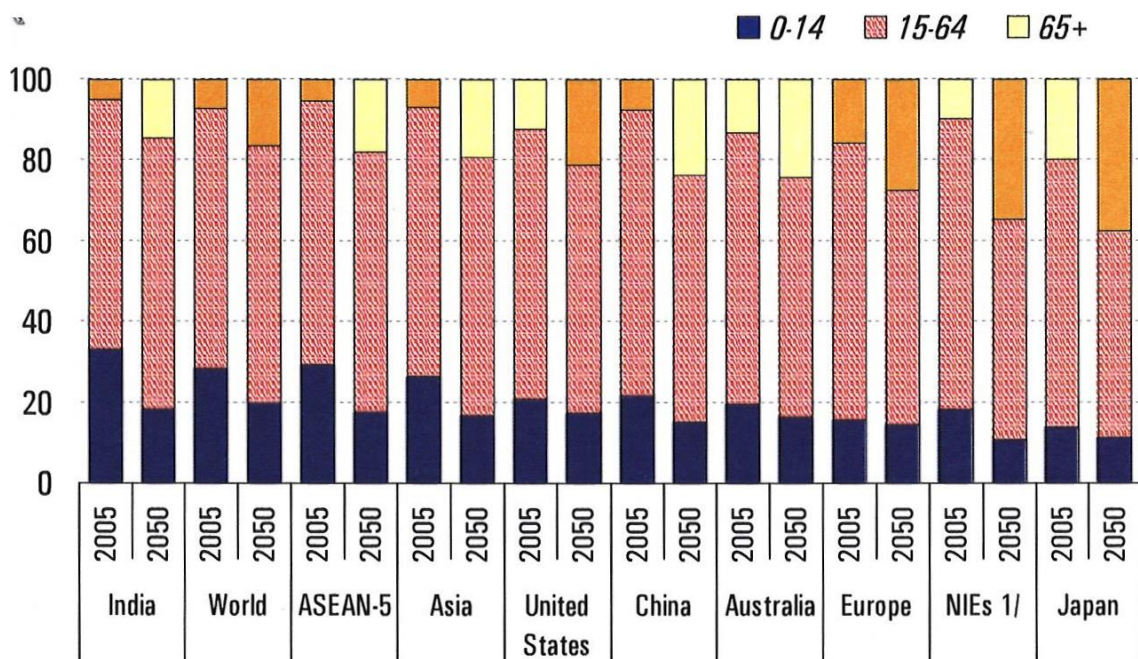
(Population in millions)

Figure 37: Comparison of Age Structures, 2005 and 2050
Source: Lee *et al.*, 2013, 12

[1] Excludes Taiwan POC

- Middle and older age workers – 35-64. They are a large group but perhaps most open to eating meat with traditional foods rather than being open to new foods.

- The elderly are China's fastest growing generation. Figure 37 shows that China is converging toward Australia in the proportion of its population in the older age groups. They will be an important market but little is known of their receptivity to new foods.

> **Recommendation Four:** Age segmentation of the Chinese market is stronger than in Australia and there are four segments which need to be addressed separately. The 15-34 market is especially open to increased meat consumption.

7.5   The Urban/Rural Factor

This paper has argued that rapid growth of China's urban population is perhaps the most important demographic factor influencing meat consumption. There are clear differences in consumption between urban and rural areas. A key question relates to whether this is simply a function of the well documented differences in urban and rural incomes or whether there are structural changes associated with being in urban areas which influence preferences and consumption for foods. One interesting study which compares food consumption in urban China between 1981 and 2004 found that changes in meat consumption were largely explained by normal price and income effects rather than structural change (Dong and Fuller, 2007). They conclude that growth of meat consumption in urban China 'are consistent with the dietary diversification which comes from income growth'. There are some interesting implications of this:

- The continuing sustained and substantial increases in income being experienced in China and especially Chinese cities are opening the potential for more and more meat consumption. Focusing efforts to market meat on cities where income growth is most substantial would then appear to be a good strategy.

- The other side of the coin, however, is that there doesn't appear to be anything intrinsic which determines urban Chinese eat meat while rural Chinese do not. Despite rapid urbanisation, half the Chinese population still live in rural areas so they are not insignificant potential market.

The latter point is important. Most commentators in this area recommend focusing efforts to market red meat in urban China and consumption figures would seem to bear this out. However, a number of issues are also important to consider:

- There is a great deal of effort in China to narrow the urban/rural income gap and include rural areas in national economic development. Narrowing of this gap would increase the potential for meat consumption (OECD, 2014).

- Chinese rural areas, like urban areas, are unequal and there is an elite market in rural areas.

- A fifth of Chinese households have one member absent for much of the time – most are in rural areas and the absent member is part of the floating population in urban China. There are important channels of communication and travel between them. At certain times of the year (Chinese New Year etc.) virtually all the absentee members return home to the village and with them bring gifts for the village based household, often involving foods that are not available in the village but are in the city and are regarded as luxuries. *Could meat products be marketed as part of the basket of gifts and goods that temporary urban migrants take back to the village?* It would have the added advantage of increasing familiarity with meat in rural areas.

- One of the interesting dimensions of the data available on per capita consumption of meat and other animal products (Table 1) is the category of 'other meats and processed meats'. Data for this is not available for urban areas for 2007-10 but between 2000 and 2006 it was higher than beef consumption and increased faster (from 2.41 kgm pp per annum to 3.8). However, for rural areas it showed a significantly lower differential to urban patterns and increased from 0.68 in 2001 to 2.14 in 2010. This would seem to indicate that processed meat has a market in rural areas. It may be that without refrigeration available in many rural areas processed meats, especially canned meat, have some market.

> **Recommendation Five:** Urban China will experience increased demand for meat, and consumption per head is much higher than in rural areas. Concentrating efforts to market red meat on large urban markets, especially those where average income levels are highest and increasing fastest, has potential.

> **Recommendation Six:** It should be investigated as to whether meat products can form part of the basket of 'city foods' which many migrant workers take back to their village on their regular visits.

> **Recommendation Seven:** The market for meat in rural China must not be neglected and strategies involving particular meat products concentrating in areas with growing incomes should be investigated.

7.6   The Regional Factor

This study has demonstrated some broad regional differences in meat consumption in China. There is clearly greater red meat consumption among the non-Han-Chinese ethnic groups of Western China. However, any regional focusing of marketing activity based on this cultural factor would need more detailed fine grained analysis of patterns of consumption than the regions used

here. Moreover, the fact that Western China incurs higher in-country transport costs may cancel out some of the advantages of greater propensity to eat meat in that area. Nevertheless, the potential is worth investigating, especially for large cities like Urunchi.

> **Recommendation Eight:**   The potential for marketing Australian meat in areas with concentrations of ethnic minorities with higher propensity to eat meat should be investigated.

It may well be, however, that more fine grained analyses will reveal significant differences in meat consumption between cities and regions in Eastern China – in fact, showed whereas low consumption is fairly uniform across rural Eastern China, there are some marked differences in urban areas. The Guangzhou-Shanghai areas stand out as areas of relatively high consumption for example. However, factors such as high income, large visitor and expatriate populations may be an explanation here rather than a simple regional difference.

> **Recommendation Nine:** The largest urbanised areas with their high concentrations of the market segments of top decile income group, foreign-born expatriates and large tourist and business visitor population are the safest bet of an established meat eating community with a sustained and increasing demand for meat, albeit, limited amounts.

7.7 The Expatriate Population

It has been demonstrated here that China is experiencing an increasing influx of foreigners, many of western background. This is inevitable as China's international linkages proliferate and as the pace of economic growth outpaces the nation's ability to produce enough experts with the skills demanded by the economy and labour market. Moreover this group is generally a well-off group and constitute a significant part of the high end demand for meat, especially in the major urban areas. They are clearly an important part of the existing market but the group is changing in terms of numbers and composition as well as location within China and developing the market further needs to take this dynamic situation into account.

> **Recommendation Ten:**   There needs to be a close study of the changing size, composition (e.g. national background) and location within China of the growing foreign population in China and the marketing of premium meat products adjusted to take these changes into account.

7.8   The Australian Chinese Population

Individual mobility in China has increased massively in recent years and this includes an exponential increase in the numbers travelling overseas to work, vacation, study and do business. Of course, this in itself is exposing more and more Chinese to meat as a major part of the day-to-day diet and hence potentially expand the market for meat in China when they return, as most of them do. It was shown earlier that Australia is one of the most important destinations for all of these types of international travellers:

- Short term visitors – tourists, business travellers
- Long term temporary residents – 457s, students
- Permanent settlers

It has been suggested here that innovative use may be made, not only of the growing size and diversity of the Chinese community in Australia but especially of the intensive channels of communication developed with their homeland. It has been shown that there is an intensive pattern of visiting between Chinese in Australia and their homeland based families. There are two basic strategies which are available:

- Using the Australian Chinese community as a bridgehead into the Chinese market.
- The intensive travel between Australia and China in itself can constitute a market.

While this needs to be the subject of focused research, two examples can be given to illustrate their potential:

1.   The Australia-China migration system is dominantly a circular one. Even around a third of Chinese who gain permanent residence in Australia go back to China to live permanently. On top of this is the many more who frequently visit Australia. Can these groups be marketed to in some way?

2.   There is a strong tradition in Chinese travelling or 'sojourning' of returning home with gifts, including exotic or highly valued goods from the origin. An intensive program to facilitate Chinese returning on a permanent or temporary basis to buy or send meat in an attractive culturally appropriate way would be very popular.

> **Recommendation Eleven:**   As the Chinese presence in Australia expands exponentially and the channels of communication between Australia and China intensify, there needs to be a detailed study to investigate how this in itself can be a significant premium market but also how it can be used as a bridgehead to facilitate the wider consumption of Australian red meat in China.

8. CONCLUSION

Zhou (*et al.*, 2012, x) conclude in their detailed study of changes in food consumption patterns in China and the implications for Australia:

'The sheer size of China's population, and the huge gap in consumption between the poor and the rich, and between rural and urban consumers, indicate that the potential for the Chinese food market to expand is significant, should the income level of the poor move towards the rich and that of the rural move towards the urban. China's inability to meet all the increased demand from domestic production renders exciting opportunities to food exporting countries such as Australia.

Australia is well placed to meet some of China's future food needs and will benefit, directly and indirectly, from China's rising demand for foods. Directly, it is expected that Australia will have opportunities to export more foods to China, particularly foods of premium quality. Indirectly, China's increased imports from the world market will create opportunities for Australia to increase its food exports to other markets'.

There can be no doubt that food consumption patterns in China, especially in urban areas, have undergone a transformation over the last two decades. The causes of these changes are several and need to be identified if future changes are to be accurately anticipated. They include the reform of China's food marketing system, privatisation of food production, procurement and marketing, the elimination of food rationing and the opening up of China's food processing and retailing sector to Foreign Direct Investment (Dong and Fuller, 2007). However, exposure to high levels of education, foreign media and influences, increased income levels and higher mobility have also been significant. This study has sought to throw light on one dimension of the massive change which is sweeping China – its demography. The scale and spread of this change had undoubtedly played a role in changing patterns of food consumption. However, to fully understand the nature of these effects, to anticipate what future changes are likely and especially to translate this into clear market signals for the Australian meat industry will take more work. It is hoped that this paper has given some direction to this effect.

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