
Rural-urban migration in China and implications for urbanization and infrastructure in the new era

Abstract:

In many parts of China, rapid economic growth, socio-economic inequality, and environmental degradation (air, water, soil) are undermining social stability and sustainable urbanization. Rural-urban migration is the main factor contributing to urban population growth. Economic opportunity in urban areas is the main ‘pull factor’ but government policies provide a ‘push factor’. A model of the relationship over time of the rural sector and the urban sectors, mainly relating to the focus on manufacturing and the services sector, is discussed. Each sector provides a market for the other. We use three case studies of different types of urban-rural development taking examples from a Prefecture-level city of about 500,000 population located in Guanzhong Autonomous Region in south east China. We analyze the infrastructure plan and land use planning in respect to the impact on labor, investment and urban growth.

Key words: urbanization, vocational training, rail, ports, transport hub, smart manufacturing, marine aquaculture, integration, governance

Introduction

China is a big country undergoing unprecedented economic development. The words ‘New Era’ in the title of this paper reflect the thinking of President Xi Jinping at the 19th Communist Party Congress in Beijing in October, 2017 when he laid out his vision in the document ‘Thought on Socialism with Chinese Characteristics for a New Era’. The New Era represents a change in direction in China’s development away from a focus solely on GDP growth towards Green development and creation of an ‘ecological civilization’. This is not to say that GDP will be disregarded but rather that it will be framed within the overall benefit of the country and its peoples.

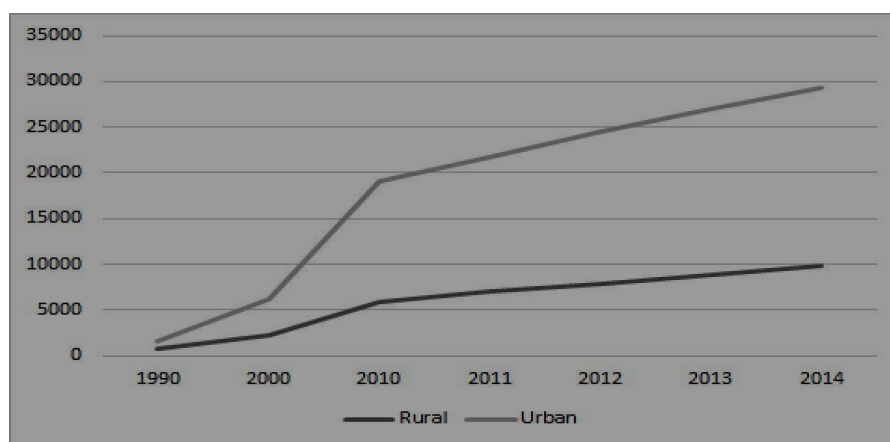
Economic growth is fueled by enormous investments in infrastructure development – railways, especially highspeed rail¹, ports, transport hubs and networks, shipbuilding, manufacturing etc. Labor to undertake construction mainly comes from employment of rural workers. In earlier decades (it still continues) most labor was classified as migrant workers who spent some time on a major project and then returned to their home village. Some acquired skills and stayed on to be part of the maintenance team. In the past there were barriers to migrant workers settling down in the larger cities. For example, children of those migrant workers who had a Hukou² from another province or region were denied access to schools, health services etc. in the city where their parents were migrant labor. It took decades for the injustices in the system to be fully realized.

The Hukou system was introduced by the Mao Zedong Administration as part of ‘New China socialism building’ strategy in the late 1950s and formed step by step by more policies issued later. Its purpose was to prevent the flood of unskilled, poorly educated people deserting the countryside threatening social order while ensuring that improvement in agricultural productivity was not hampered by lack of labor.

¹ It is planned to have completed over 30,000 km by the end of 2020.
news.xinhuanet.com/english/2016-01/18/c_135021027.htm

² Hukou is a certificate that establishes the citizen’s residential address.

42
 43 Just how the government has dealt with the relationship between the rural sectors and the urban sectors
 44 since New China, depended on China's stage of development. The government has been guiding
 45 migration as a formal rural development strategy since the early 21st century with a view to boosting
 46 agricultural intensification and promoting rural development. Nowadays the government is trying to
 47 revitalize the rural regions to cope with unbalanced rural-urban development and to reduce rural-urban
 48 income inequalities. There is widening gap between rural and urban dwellers and this is even more
 49 noticeable when we compare disposable income (Fig.1)
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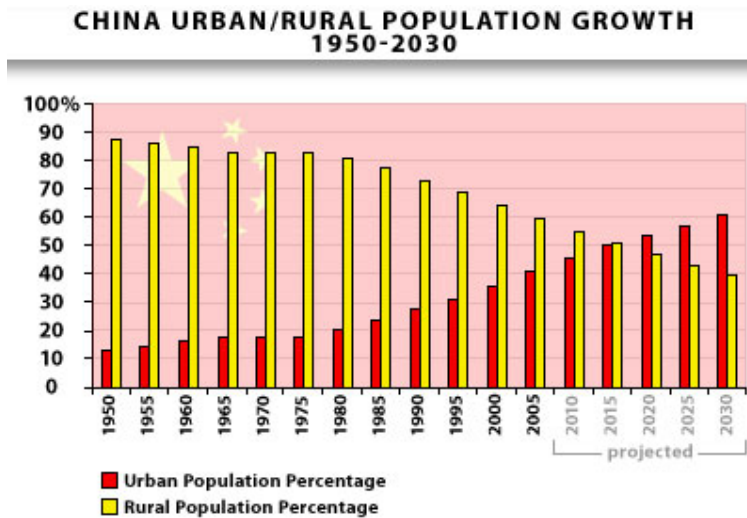


51
 52 Fig.1 The gap between incomes of rural and urban households is accelerating (compiled by the authors
 53 from multiple sources).

54 While China has all but eradicated extreme poverty, the poverty line has declined as a percentage of
 55 average disposable urban income, from 26.7% in 1998 to 13.8% by 2010. This means, in effect, that to be
 56 considered poor, one has to be quite far away from middle class living standards.

58
 59 Under the 13th 5-year Plan emphasis was placed on urbanization of China. Targets were set to have 80
 60 million people to become urbanized by 2020³ and 200 million by 2040 to a point in 2030 when more
 61 than two-thirds of China's population will be urbanized (Fig 2). Over 100 million who are residents of
 62 cities will get their 'hukou' in 2018. China will limit land use in cities with over 5 million residents to
 63 prevent city expansion from eroding the area offarmland.

³ http://www.chinadaily.com.cn/business/2014-01/11/content_17230381.htm (accessed Dec26,2017)



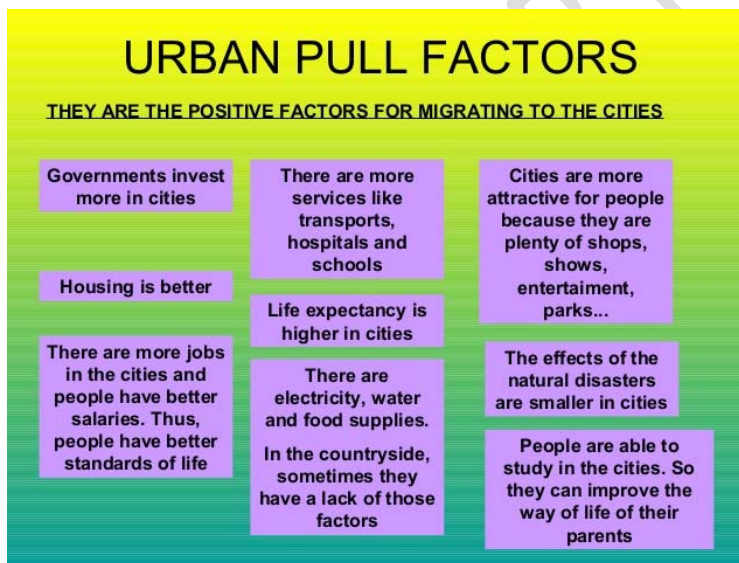
64

65 Fig. 2 From fewer than 12% of the population living in urban centres in 1950 to a target of more than
 66 60% urbanization in 2030. Note the upswing from the early 21st century.

67

68 There are many 'pull' factors that attract people to urban areas (Fig 3) as well as 'push' factors arising
 69 from government policy.

70



71

72 Fig 3. There are both pull and push factors that influence migration to urban areas. Here are some pull
 73 factors.

74

75 This mass migration will not result in everyone moving to an already overcrowded 'first tier' city like
 76 Beijing-Tianjing, Shanghai, Guangzhou or Shenzhen. Instead third and fourth tier cities and many
 77 prefectural-level hubs or even large county cities will absorb many migrants. All migrants will need
 78 jobs and housing, some will buy property, others will want to rent and still others will live in
 79 sub-standard dwellings in what have become known as 'city villages' (Fig. 4). Some of the migrant
 80 workers find a job in the urban area and buy residential property but they also possess land in the

81 villages so they are called double-residential persons. For them social integration is becoming a big
82 problem. Many would-be migrants can find a job in the urban areas but cannot reside there or educate
83 their children there and must migrate seasonally. Finally, most have to come back to the rural society. It
84 is hard for them to apply new-found skills and be entrepreneurial without targeted policies for rural
85 revitalization.
86



87
88 Fig. 4 City villages can occur near the CBD or in enclaves like this one
89

90 These can occur in the periphery of the CBD (downtown) to the outer edge (see schema in Fig 6).
91 Prefectures and County governments across the country are acquiring land, building housing, schools,
92 hospitals and developing infrastructure (better roads, integrated transport terminals) and manufacturing
93 bases. Under the new era emphasis is on 'ecological civilization' so urban greening and beautification
94 of the landscape is a major consideration in urban development and planning to ensure adequate green
95 space.

96
97 The need for land to support industrialization and urbanization has resulted in forced displacement of
98 farmers and conversion of agricultural areas into land allocated for industrial projects and urban real
99 estate (housing) developments on the periphery of every city (Fig 5). There is a changing relationship
100 over time of the rural sector and the urban.



101
102

103 Fig 5 Farmland on the edge of urban areas is under threat as urban areas expand

104

105 Each sector provides a market for the other. Growth in both requires investment, but of distinctly
106 different kinds. Their integration results in an S-shaped curve. The current need is for appropriate
107 investments and policies to develop the productivity of the urban sectors so that they can continue to
108 stimulate-and support modernized agriculture and still provide jobs for those who are leaving
109 agriculture. The relationship between industry and agriculture in China is in transition depending on the
110 geographic region and its phase of development. Many coastal areas are experiencing rapid change
111 while inland areas and western China generally are proceeding at a slower pace. The new strategy of
112 rural development and urbanization in China emphasizes town development. From the perspective of
113 rural-urban integration, the big driver is the need to lessen the disparity between the industrialized
114 urban centres and the rural hinterland.

115

116 **Many questions -- fewer answers**

117

118 A key question is what happens when agricultural labor is no longer needed as a result of sudden
119 structural economic shifts? How does the transition from unskilled labor to trained technician or skilled
120 tradesperson occur? What roles do the Vocational Training Colleges have in preparing for the surge of
121 young people seeking a trade (plumbing, electrician, brick layer, electronics technician, hairdressers,
122 sales persons, nurses' aides, and health care providers, etc.

123

124 Whilst many of these questions and challenges have been faced in what are now developed countries
125 the pace at which the transition occurred was so much slower there. China today is rushing ahead. It
126 now in the post-Industrial era and is now a major proponent of high tech electronically-based systems
127 of communication, banking, and manufacture, with much of the last-mentioned, by use of robotics.
128 China, is at the forefront of technology to commercialize driverless vehicles, electric cars, Smart
129 manufacturing and so on.

130

131 **Multilevel Metropolitan Governance**

132 Leadership is concerned about the megacities. The Development and Reform Commission and

133 government Think Tanks like the Academies of Social Sciences, private research institutes, and other
134 academic bodies express concerns about China's megacities. The immediate causes of such high-level
135 concern are threefold. First, socioeconomic and fiscal disparities between metropolitan centres and
136 their outlying settlement clusters have reached a critical juncture and current domestic demographic
137 trends portend an ever-worsening gap in terms of economic resources, including provisioning of water
138 and fresh food. And the problem of waste disposal. To exacerbate the situation there is a serious air
139 quality problem as burgeoning automobile numbers create many pollutants. Secondly, sharp
140 competition within the global economy increasingly threatens the economic base of some core cities
141 based on outdated manufacturing (steel making, cement making etc) and their inner-ring suburbs. New
142 productive investments and industrial growth are pre-dominantly in the outer suburbs and edge of cities.
143 And thirdly, urban sprawl -- uncontrolled land development and 'leapfrogging'—is visibly threatening
144 the sustainability of the physical environment of large urban communities.

145 Some argue that metropolitan governmental fragmentation is the primary cause of the newly
146 emerging urban problems, and that some form of regional governance is the necessary first step
147 towards a solution. Top-down directives, though out of favor, are necessary for managing metropolitan
148 development and ensuring fiscal equalization. Furthermore, the hyper-complex nature of governance
149 currently in place requires multilevel intervention, to reinforce local moves in the direction of regional
150 co-operation and consolidation. Intergovernmental strategies are essential to promote metropolitan
151 revenue-sharing, 'smart growth', the 'new urbanism' and the targeting of skills training, housing and
152 transport opportunities to match the changing intraurban and interurban location of employment
153 expansion and job needs. Central and local Revenue systems, revenue transfer at the central level,
154 building supportive mechanisms at local level between regions where one body in a developed area
155 provides money and talents to the body in the undeveloped region. That is in China, between the more
156 developed eastern seaboard cities and undeveloped western hinterland where there is little or no
157 revenue sharing between rural-urban communities.

158
159 Thanks to a booming national economy, most cities in China are experiencing a strong fiscal and
160 economic growth. Several factors need to be high on the agenda (i) *Expanding Homeownership and*
161 *Affordable Rental Housing*. Homeowners can build strong neighborhoods but providing more
162 assistance for rental housing is critical for alleviating the distress of worst case housing needs and
163 homelessness; for overcoming the "housing/jobs mismatch" created by metropolitan development
164 patterns; and for providing families with the support and stability they need to become part of the new
165 labor markets. (ii) *Promoting Smarter Growth and Liveable Communities*. To realize the billions in
166 savings that could be generated by strengthening existing developed communities, the strategy includes
167 a major initiative to promote liveable communities. It also includes measures to ensure public safety,
168 strengthen schools, and preserve natural resources and historic amenities. By providing communities
169 with strong tools to tackle these challenges, the strategy helps enhance the attractiveness of both new
170 and existing neighborhoods for residents, businesses, and investors.

171
172 The pattern throughout China today is for investment and job creation in the exurbs⁴ (see Fig.6) and
173 rural-greenfield locations purposely targeted by large scale domestic and international corporations e.g.
174 automobile and aircraft assembly plants, electronics manufacture, bio-medical industry, chemical
175 material manufacturing, smart industry, logistic centres and cloud data centres. We need a new

⁴ Land beyond the suburbs, often requiring land acquisitions totalling hundreds of hectares

176 theoretical basis for our understanding of urban and regional economics and a better appreciation of
 177 urban-rural sociology in a rapidly-changing China. The governments should make supportive policies
 178 and reform the system in both rural and urban areas to be based on more human-centred approaches
 179 with regard to land use rights, Hukou reform and labor mobility, and the right of farmers to choose
 180 which crops to plant so as to maximize revenue from their agri-food systems.

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187 **Qinzhou Prefecture – a microcosm that epitomizes China in the new era**

188

189 In the cameos that follow we hope to illustrate the type of regional development that has taken
 190 place or is planned in the near future. We choose as our study site, Qinzhou Prefecture in the Guanxi
 191 Zhuang Autonomous region in south China (Fig. 6).



192

193 Fig.6 South China is undergoing massive development under the impetus of the 21st Century

194 Maritime Silk Road initiative as part of China's Belt and Road Initiative

195

196 The Prefecture's population of over 4 million is made up mostly of the Han nationality and area
 197 spanning 10, 843 km² that includes several counties. The Prefectural city⁵ of Qinzhou lying on the
 198 Gulf of Tonkin has an urban population of over 600,000. The local government has some
 199 forward-looking plans to transform this strategically-placed coastal region and its port city into a
 200 modern metropolis and economic powerhouse over the coming decade. The development strategy is
 201 favoring comprehensive industries but also sees a bright future for eco-tourism, sightseeing,
 202 recreational and resort facilities etc. Plans are well advanced to bring this about along the beaches,

⁵ In China the administrative hierarchy is Province, Prefecture, County, Township and Village. A Prefectural city might have 5-8 Counties within its boundaries and a population exceeding 10 million.

203 foreshore and in hinterland (Fig.7)

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205



206

207 Fig.7 Coastal zoning has been done, land use planning for foreshore and hinterland are
208 coordinated.

209

210 ***Cameo 1 Rail/port integration*** Geographically, Qinzhou is located at the core of North (Beibu) Gulf
211 also known as the Gulf of Tonkin), where there is a very important port to become a link in the
212 rejuvenated 21st Century marine silk road as proposed by China as part of the ‘Belt and Road
213 Initiative’⁶. Qinzhou is a starting point, and a connection/or transportation hub facing eastern Asian
214 countries that lie around the South China Sea. Qinzhou is the terminus of high speed, freight-only,
215 rail system linking Lanzhou, a city of 4 million people on the banks of the Yellow river in Gansu
216 Province to Qinzhou, a lesser- known coastal city on the Gulf of Tonkin. The high-speed rail line is
217 over 1650 km long and can deliver freight both ways in about 7 hours – this will cut the time from 27
218 hours, using the old lines, and makes possible delivery of fresh produce like sea food and consumer
219 goods for regional sales or for on-forwarding through the upgraded rail links to Central Asia and
220 Europe as part of the ‘Belt and Road Initiative. It also allows rail delivery of vital strategic supplies,
221 including military equipment. The recently opened rail link is designed to make Qinzhou city a regional
222 transport hub. Qinzhou is also the terminus of a high speed (300 km/hour) passenger train service to
223 Guangzhou, capital of China’s richest province with its own links to Hong Kong and Macao.

224

225 The port facilities in Qinzhou will be further upgraded to handle bigger and faster container ships as
226 well as support the recently-revived fishing industry based on high tech marine aquaculture (see Cameo
227 3). The Qinzhou Free Trade Zone was officially established and approved by the State Council in May
228 2008 as a state-level free trade port area and is part of the Qinzhou port that covers 10km² has an
229 annual throughput capacity of 10 million tons. Shipbuilding will also be feature of the port facility and
230 is expected to employ thousands in the construction phase and in the ship building itself, although the
231 skill set required (welders, riveters, machinists, marine architects, maritime diesel technicians etc) for
232 the latter is likely to be provided by specialists from other parts of China.

233

⁶ english.gov.cn/beltAndRoad



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Fig 8 Upgraded port facilities and container terminal are well underway



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Fig 9 China has established several Free Port Trade Zones, including some Dry Port Zones in the hinterland.

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Cameo 2 Smart manufacturing and infrastructure

A major green fields development plan will see the construction of a large (27,000 m²) facility Fig. 10).



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244

245 Fig. 10 Greenfield sites are popular because they face fewer constraints and provide opportunities for
246 entrepreneurs to design a facility to suit their present purposes and also leave room for future
247 expansion.

248

249 This facility occupies 7.5ha and is on former woodland/farmland, including cropland. Displacement of
250 7 households occurred. Compensation included provision of apartments in Qinzhou metropolitan area
251 of in similar apartments in the county town and offers of off-farm employment. The facility, once
252 completed, will be an example of Smart manufacturing. Smart manufacturing (SM) is a
253 technology-driven approach that utilizes Internet-connected machinery to monitor the production
254 process. The goal of SM is to identify opportunities for automating operations and use data analysis to
255 improve manufacturing performance. Smart Manufacturing is about big data and predictive analytics
256 calculations and artificial intelligence. It puts machines in the business of real
257 decision-making—outside the range of human capabilities. The emergence of cheap connected devices,
258 coupled with the availability and affordability of mass computing power, has been the biggest driver of
259 Smart Manufacturing.

260 The location of various industrial facilities in Qinzhou Prefecture is determined according to the North
261 Gulf Development Master plan, as a part of Belt and Road Initiativeⁱ and has been integrated into the
262 intra-regional transportation grid that is under construction.

263

264 **Cameo 3 Rejuvenated maritime aquaculture industry and associated integrated packing, and**
265 **shipping facilities**

266

267 Artisanal fishing and marine aquaculture on a small scale (mainly shell fish and shrimp) have been a
268 feature of the coastline around the Gulf for millennia. Recent advances in the raising of marine animals
269 (fin fish, shell fish, crustaceans and even specialty creatures like squid, octopus, sea cucumber etc)
270 have made it possible to support coastal populations with high yielding aquaculture facilities that return
271 a good level of income. Plans are being developed in conjunction with local government (both
272 Prefectural and Regional⁷) and commercial firms to utilize the waters of the Gulf and the adjacent
273 hinterland to establish a ‘state of the art’ marine aquaculture industry. Artisanal fishing will continue
274 but it is envisaged that many local people will get employment in the new ventures. Initially, in the

⁷ Guangxi is an Autonomous region for Zhuang ethnic minority

275 construction of the facilities in the sea, at the port and in the hinterland where processing, packing and
276 shipping will occur.

277 Development of modern marine aquaculture is ongoing as evidenced by a grid of black spots, line after
278 line, straight as the rays of the rising sun, from one shoreline to the other. The spots are buoys that support
279 the submerged platforms and thick netting that grow scallops, clams, oysters, and mussels. The buoys,
280 tended by fishermen in wooden boats that have become gray and weathered by decades of use, are the
281 most visible features of an aquatic food factory that has potential to employ hundreds and feed many.



282

283 Fig. 11 Artisanal fishing and small-scale culture of shellfish and crabs is giving way to large-scale
284 marine aquaculture

285 Production practices have been adopted to ensure that Qinzhou's marine aquaculture industry becomes a
286 model of local food production that is ecologically sustainable and safe. The waters of the North Cape
287 bays where shellfish are produced are clean. Shellfish gain their food from the tides; they are not fed.
288 And fishermen don't use antibiotics or any other drugs to raise them.

289 Marine aquaculture is but one part of broader investment initiative that has seen Qinzhou port raised to
290 the status of Free Trade Port Area (see Cameo 2)

291

292 **Conclusions and summing up**

293

294 There are many major infrastructure projects going on in China, of which these three cameos are an
295 example They employ hundreds of thousands of rural workers. The unskilled labor force in Qinzhou
296 city alone is over 15,000. The government of China has chosen an opportune time to facilitate
297 migration to the urban areas as the types of developments described briefly above are being replicated
298 and scaled up across China – many as a direct result of the economic impetus created by the Belt and

299 Road Initiative⁸. There are challenges with infrastructure expansion such as rail, maritime facilities,
300 manufacturing, processing and packing facilities, and actor coordination. Cheap land and labor may not
301 be enough if there is a dearth of top talent.

302 A reasonable debate, informed by an understanding of changing rural–urban settlement patterns, is
303 required as a basis for local and regional planning. There are research questions to be answered (see
304 above) and a greater degree of coordination across the different levels of government must to be
305 achieved before everything will be better. We need a new theoretical basis for our understanding of
306 urban and regional economics that focuses on land and labor, factors that are major part of urbanization
307 and rural revitalization in the new era. The sociological aspects relating to the rural-urban interface
308 are often neglected in the rush to move and to build and develop. We hope that the observations we
309 make here may help to foster more research and investigation into this important aspect of China’s
310 planned shift to an urbanized society.

311

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331

⁸ english.gov.cn/beltAndRoad