AYLP
HONG KONG & GUANGZHOU

Assignments

1. Watch "Under the Dome" – see task paper

2. Write a reflection on your best leadership experience – see task paper

3. Read the attached excerpt from "Sustainable Development and Modern China," a curriculum developed by the Stanford Program on International and Cross-cultural Education (SPICE). This will provide you with some background on issues of urban sustainability in China that will be useful context when we are in Hong Kong and Guangzhou.

4. At the pre-departure orientation, we will be meeting students from Hong Kong (and other parts of Asia) who are participating in VIA's Global Leadership & Engagement (GLE) program. Come prepared to welcome them to the Bay Area, and to learn more about their home countries.

TASK: Watch "Under the Dome"

"Under the Dome" (穹顶之下) is a documentary film about air pollution in China by former journalist Chai Jing that was released earlier this year, and quickly became a phenomenon in China, and around the world.

Please watch the documentary (available here with English subtitles: https://www.youtube.com/watch?v=T6X2uwlQGQM) and prepare for a group discussion at the pre-departure orientation.

Consider the film from three perspectives:

- A film critic
  - Why do you think the filmmaker made this film?
  - How effective do you think she was in communicating her message?
  - Were there parts of the film that could have been improved?
- A scientist
  - What environmental issues are central to this film?
  - Was the science in this film accurate? Was it easy to understand?
- A member of the general public
  - What was your reaction to the film? Did you learn anything new? Did you change your mind about anything?
  - What can you find out about how the public reacted to this film when it was released? About how China reacted?

TASK: Leadership Reflection

You will be exploring leadership best practices in a workshop at the pre-departure orientation. In order to prepare for that workshop, please take some time to reflect on your own leadership, and come prepared to share your experiences. Please complete the following assignment, and email it to Brooke at brooke@viaprograms.org by June 25.

My best leadership experience assignment:

1. Recall a time when you did your very best as a leader. Think about a time when you set your own standard of excellence as a leader. This experience can come from school, work, sports team, clubs, religious group or involvement in the community. It can be from the past or happening right now.

Write a brief description of your experience. When did this occur? Who was involved? What were you trying to accomplish? What challenges did you face?

2. Thinking about the experience you just described, what are the three to five actions you took as a leader that made a difference? What specifically did you do to mobilize your group or team to get extraordinary things done?

Examining China's Urbanization: Urban Infrastructure and Planning

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: urban infrastructure and planning. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Urban Infrastructure and Planning

Whether they reside in or near the urban center, one billion people will live in China's cities by 2030.[23] To support this massive human migration from rural areas to urban cities, 5 billion square meters (nearly 2,000 square miles) of road will be paved and 170 mass-transit systems could be built, along with 5 million buildings (50,000 skyscrapers, equivalent to 10 cities the size of New York). By 2030, it is estimated that China will have 221 cities with a population of greater than one million.[24]

urban planning—the professional process of studying and planning a city's development, including land use, transportation networks, community design, architecture, and environmental management

These mind-boggling numbers force China to wrestle with complicated questions of urban planning. The Chinese government is encouraging urbanization as a pillar of economic development. The challenge is not about restraining the growth of cities, but ensuring that the growth is smart, well planned, and environmentally sustainable.[25] Two primary ways exist to increase the supply of housing in growing cities: intensifying urban density and expanding suburban sprawl.

Some urban planners argue that cities should be more densely packed. In theory, increasing the population living within current city footprints would encourage better public transportation systems as travel by car becomes impractical. Land prices would rise, forcing old factories to relocate outside the city with lightly polluting services taking their place. The cleaner cities would then attract talented people with innovative

ideas to create new businesses and investment.[26] Urban planners sometimes refer to this strategy as an agglomeration effect.[27] Other urban planners argue that, in reality, tightly packed cities usually suffer from high levels of traffic congestion and pollution, ultimately degrading the quality of life.

agglomeration—a heap or cluster of various elements; in the urban context, an extended area of cities, towns, and suburbs built up around an urban area

Suburban sprawl, in contrast, is the result of people moving beyond urban cores to seek less expensive housing and more open space. As people commute from suburban homes to urban jobs, air pollution from vehicles is increased. The extension of infrastructure such as roads and pipelines also is necessary, and it consumes additional resources such as land and energy. For example, Beijing, circled by six "ring roads" that encourage automobile use and urban sprawl, according to the OECD, generates more pollution per person from cars and trucks than the more densely populated city of Shanghai.[28]

infrastructure—the underlying foundation of a system or organization, including public resources such as roads, buildings, pipelines, and airports

OECD—the abbreviation for the Organization for Economic Co-operation and Development (an international body consisting of 34 countries united by interest in and policies concerning economic progress, democracy, and world trade)

Given the impending massive influx of population into its cities over the coming years, China will wrestle with issues relating to both urban density and suburban sprawl. For example, China has about 160 cities with populations in the range of 200,000 to one million that have yet to be significantly affected by urbanization. Some urban planners are concerned that the Chinese government will attempt to develop them all, resulting in a mishmash of highways, industries, and pollution.[29] According to another prominent study, urban growth in China is expected in cities with a population of fewer than 10 million people.[30] Yet another strategy under consideration is the "knitting" together of urban sprawls, turning some of China's largest and most productive cities into one grand megacity and forming potential clusters of up to nearly 100 million people.[31] (Beijing currently holds a population of 20 million, and Shanghai is home to 25 million.)

China also is pursuing another "clustering" tactic—the consolidation and development of particular industries or specialties within a city or group of cities, such as aerospace in Xi'an or modern coal-fired power plants in Ningxia, with the hope of spawning new ideas through intellectual fission.[32]

fission—a splitting up into parts, or the process of becoming more specialized

In a 2013 report by a top Chinese think tank, China's most modern cities, including Beijing, Shanghai, and Guangzhou, failed to make a key list of habitable cities. Although they ranked in the top 10 in terms of economic advantages, cultural development, academic resources, and intellectual atmosphere, they dropped to the bottom with measurement of habitable and ecological development, including air and water pollution, traffic jams, housing tension, even food safety issues.[33]

think tank—an institute, corporation, or group organized for interdisciplinary research, and which often makes policy recommendations based on the research

Chinese cities are complex living organisms. Urban planning is complicated, necessarily juggling simultaneous pressures—economic, geographic, environmental, governmental, and social. For example, in an effort to encourage industrial growth in western regions of the country, the Chinese government is working with developers to transform the city

of Lanzhou into a major urban center. As the capital of a poor province, Lanzhou is an important trade and transportation hub. It also is known for some of the worst pollution in all of China. A city of 3.6 million in 2010, Lanzhou will absorb over a million new residents in coming years.[34] Lying in a steep valley by the Yellow River, it is already crowded. Yet, bulldozers literally are leveling mountains to increase Lanzhou's footprint by 70%, an enormous and highly controversial project in view of lax government oversight of the potential environmental and safety effects and the fact that it will siphon huge amounts of water from an already parched region.[35]

In view of the enormous power of China's central government to route people to favored locations through relocation projects, financial incentives, and residence permit policies, how the government chooses to use its power and planning policies over the coming decades will have great impact on China's urbanization process.

Project Directions and Guidelines

Now that you have read this handout, discuss it with your groupmates. As a group, develop two or three research questions relating to your topic. Conduct research on your questions, and then create and deliver a group presentation to teach others about your topic.

Your presentation will be assessed on the following criteria: quality and relevance of research, use of appropriate visual aids and text, neatness, clarity and cohesiveness of presentation, manner of delivery, equal involvement of group members, and pacing/timing.

Examining China's Urbanization: Eco-Cities and Building Codes

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: eco-cities and building codes. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Eco-Cities

The dilemmas posed by urban density, suburban sprawl, and clustered megacities are vast and complex. Much thought is being directed to new models of urban development. How can cities host more people and encourage economic activity, while living within environmentally sustainable limits? A "livable city" would feature efficient use of energy, achieved through adequately insulated buildings constructed from minimally polluting materials, as well as power generated from renewable and non-carbon sources. The layout would stress compact land usage, combining residences, social services, business, and recreation within smaller neighborhoods to minimize long commutes and to support public transportation.[36] Reduced congestion together with minimal waste and wise water use would curb pollution. In short, an economically diverse number of residents ostensibly could work, play, and live without harm to themselves or to nature.

non-carbon—emitting no carbon dioxide, a greenhouse gas

In collaboration with Singapore's government, China is building an eco-city near Tianjin, an area once considered a polluted wasteland. Cleanup of soil and water is under way, the land being prepared to host green businesses and some 350,000 residents by 2020. Qualities of a livable city will be featured to the extent technologically feasible at this time. For example, 20% of the city's power must be emission-free, from solar,

wind, and geothermal sources. It's not 100% green, but it is an enormous improvement and a step in the right direction. To prevent the city from becoming a "bubble" for the wealthy, the Chinese government plans to subsidize and sell 20% of the homes to low-income families, and to rent apartments to white-collar and blue-collar workers. A new governmental slogan—"breathing the same air and working together"—is a reminder to all that wealthy and/or corrupt individuals cannot hide in privileged economic communities.[37] The Tianjin eco-city experiment will help elucidate the challenges of adapting to a greener lifestyle and influence blueprints for future urbanization across the planet.[38] Although none on the scale of Tianjin, eco-city initiatives have been rolled out in at least 100 Chinese cities.

subsidize—to assist someone or something by granting financial assistance; to support (an organization or activity) financially

white-collar—professional workers, stereotyped as wearing white shirts in an office setting in contrast to "blue-collared" uniforms in physical trade occupations, also connoting higher earnings and education level

blue-collar—workers in physical trade occupations, stereotyped as wearing blue uniforms or protective clothing, in contrast to "white-collared" professionals in office settings, also connoting lower earnings and education levels

greenhouse gases—any of the gases in Earth's atmosphere that absorb or emit solar radiation and thus contribute to the greenhouse effect, or global warming, including carbon dioxide, methane, ozone, and the fluorocarbons

high-carbon—emitting high amounts of carbon dioxide, a greenhouse gas

Building Codes: Construction and Demolition

On the other hand, simply improving existing building codes would have a greater and more immediate environmental impact than any new eco-city. Heightened construction standards alone, as dull as that might sound, will have the most positive effects on urban pollution in the next 10 years.[39] One ton of cement—the foundation of urban architecture—produces the equivalent of at least one ton of carbon dioxide in the atmosphere. Much of the greenhouse gases contributing to air pollution and climate change emanate directly from continuous urban construction.

In an effort to keep up with demand and budget pressures, many Chinese buildings have been constructed poorly, using, for example, low-quality cement and insufficient insulation (making them hard to heat or cool efficiently). As a result, many buildings deteriorate quickly and are being torn down and replaced with new ones within one or two decades of construction. Ironically, demolishing buildings is essentially the greatest high-carbon activity in China at present.[40] Furthermore, the lack of attention to, and enforcement of, building codes that mandate efficiencies mean that buildings in China consume more energy than the country's largest heavy industries—steel, iron, and cement—combined.[41,42] With the unprecedented level of construction in China, currently and for decades to come, China faces pressure to ensure building quality and longevity.

Project Directions and Guidelines

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Examining China's Urbanization: Energy

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Energy

China is constructing nearly 2 billion square meters (772 square miles, or 373,000 football fields) of new buildings—roughly equivalent to the building footprint of Canada—every year. Chinese families currently use 80% less energy per square meter than families in North America. However, this gap is being narrowed daily as Chinese become wealthier and upgrade their lifestyles with electric appliances, larger homes, and cars. Without improved energy efficiency in buildings by 2020, the energy use of China's buildings alone will account for one-fifth of the world's total coal consumption.[43] Furthermore, China is using enormous amounts of cement, steel, and aluminum to build new urban infrastructure, and all these materials require energy to produce.[44]

infrastructure—the underlying foundation of a system or organization, including public resources such as roads, buildings, pipelines, and airports

Of China's current energy resources, coal provides 70%; oil 20%; hydroelectric, nuclear, and wind power 7%; and gas 3%.[45] Coal remains the predominant fuel in China today and, when burned, is China's top emitter of greenhouse gases. In 2012, China consumed as much coal as the rest of the world combined. Industry consumes the majority of China's energy. Industrialization together with urbanization will maintain China's coal consumption at record highs of around 4 billion tons per year.[46] China's total domestic energy production has increased more than four times in 30 years, much of it based on the country's coal production.

greenhouse gases—any of the gases in Earth's atmosphere that absorb or emit solar radiation and thus contribute to the greenhouse effect, or global warming, including carbon dioxide, methane, ozone, and the fluorocarbons

industry—production of goods and services; manufacturing

The transportation of coal itself is highly energy inefficient. It must be moved from China's mineral-rich northwest to the highly populated and industrial southeast seaboard and coastal power plants. Water—also in short supply—is then needed for extraction and for maintaining the boilers for burning. Some experts recommend that China move away from the cross-country transportation of coal and focus on increasing its energy imports instead.

China's rising prosperity will not only increase overall energy consumption but also shift China's demand toward petroleum products, especially gasoline. It is estimated that by 2020, China will import approximately 60% of its oil and 30% of its natural gas. By 2025, urban China will be consuming 20% of global energy and will have increased oil demand by up to 25%.[47]

petroleum products—materials derived from crude oil as it is processed in refineries, including fuel oils such as gasoline, as well as asphalt, paraffin wax, plastics, water pipes, fertilizers, insecticides, linoleum, detergents, and many more daily products of modern life

natural gas—a fossil fuel, considered a cleaner and lower-carbon emitting source of energy than coal or petroleum, often used for heating, cooking, electricity generation, some vehicular fuel, and an ingredient in the manufacture of plastics

China's government has ambitious plans to replace its coal-fired power plants, to fuel more cars and buses with natural gas, and to raise standards for vehicle emissions. If all goes according to plan, the capital's central urban areas will be completely coal-free by 2015. The shift to natural gas so far has been restricted to cities, forcing coal plants to move beyond urban centers. But some cities still may use electricity generated by coal; the pollution will just be emitted beyond city boundaries.[48] On the other hand, air moves. Therefore, efforts to limit air pollution need to extend beyond local or even regional areas. Recognizing this fact, China is working on improved regional environmental coordination efforts.[49]

Project Directions and Guidelines

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Examining China's Urbanization: Greenhouse Gases

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: greenhouse gases. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Greenhouse Gases

greenhouse gases—any of the gases in Earth's atmosphere that absorb or emit solar radiation and thus contribute to the greenhouse effect, or global warming, including carbon dioxide, methane, ozone, and the fluorocarbons

China is the world's largest emitter of greenhouse gases, totaling a quarter of the world's carbon emissions. Emission sources are primarily coal-power plants and vehicles, as well as China's iron and chemical industries, ore refineries, and concrete makers.[50]

"Airpocalypse" cried the media as levels of air pollution in Beijing climbed to record-breaking levels in late 2012. Among other measures, Beijing authorities responded with pollution reduction measures, promising eventually to remove 180,000 old vehicles from the city's roads, close 450 heavily polluting plants, and upgrade tens of thousands of coal-burning boilers.[51] Also, by setting dramatically more efficient fuel standards, China's government plans to reduce emissions more than 90%, even though the deadline for implementing that standard is not until 2018.[52] Various organizations and institutions in more than 60 Chinese cities also began to monitor and publish air quality data for the dangerous air pollutant known as PM2.5. This new transparency will lead to air-quality warnings and necessary actions by individuals and government to minimize exposure and further track and reduce emissions.

transparency—operating in a way that is openly communicated, accountable, and easy for others to see what decisions are made or actions are performed

In May 2013, China's National Development and Reform Commission proposed for the first time in history a cap on China's greenhouse gas emissions. The proposal will put a ceiling on the emissions, forcing emitters to adapt technologically to these stringent limits. Although the

impact will depend on the actual level of the cap, experts say China's willingness to accept a limit on emissions will compel other countries—including the United States, the world's second-largest emitter of greenhouse gases—to agree to significant cuts in production of their own carbon emissions in a coordinated effort to tackle global warming.[53] Even with a cap, based on current trends, China's carbon emissions will continue to rise and ultimately peak around 2030.

One global trend to aid in capping emissions is carbon trading. China is piloting a program domestically in 2014, in Shenzhen and six other cities. Essentially, government places a cap on carbon emissions for factories within an industry, for example. If one factory emits less than allowed by the cap, it can sell a credit to a factory that has exceeded limits. This trade provides incentive for a factory to minimize emissions so as to profit from its surplus credit, and penalizes the overpolluting factory financially by forcing it to buy credits from the underpolluting factory. If no surplus credits are available for trading, then the overpolluting factory must reduce or cease production. The trade thus balances out lesser and greater emissions and carbon remains capped at a certain level.

Additionally, by 2020, China has agreed to cut its carbon dioxide intensity —the amount of CO_2 produced per dollar of economic output—by about 40%, compared with 2005 levels.[54] A shift to a low-carbon economy requires China to scale up its investments in non-fossil fuel energy. China is already the world's leading investor in renewable energy, and plans to increase the renewable energy share of China's total energy market from 7% in 2010 to 15% in 2020.

carbon trading—a program in which carbon emissions are capped and factories that emit less pollution than the cap permits can trade surplus credits for financial profit with factories that emit too much and must either buy credits or limit production so as to reduce emissions

CO_2—the chemical symbol for carbon dioxide

economic output—the quantity of goods or services produced by a company, industry, or country

low-carbon economy—an economy that is fueled by energy sources that emit low amounts of carbon dioxide

non-fossil fuel energy—energy that is derived from renewable sources such as hydroelectricity, wind, and solar power, and not from fossil fuels such as petroleum and coal

Project Directions and Guidelines

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Examining China's Urbanization: Water Scarcity and Pollution

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: water scarcity and pollution. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Water Scarcity and Pollution

Climate change is predicted to have a wide range of effects on water resources because of a changing water cycle. For example, many of China's major rivers originate from glaciers, which are melting as a result of global warming. In June 2013, China's Ministry of Environmental Protection reported that 60% of the groundwater it tested rated as "poor" or "very poor."[55] Due to urban population pressure and widespread industrial pollution, of the approximately 660 cities in China, 400 already lack sufficient water. The World Bank estimates that by 2030, China's per capita supply of water will have fallen to a level that meets its definition of a water-scarce country. Currently 63% of China's water is used in agriculture, 23% is used in industry, and 14% is used domestically.[56]

industry—production of goods and services; manufacturing

The demand for water is a complicated interplay among economic development, energy, and trends in a population's size, health, changes in standards of living, and urbanization. The water-energy nexus—the fact that producing energy uses water and providing freshwater uses energy—puts tremendous strain on both resources upon which China depends for survival. As China's urbanization continues at breakneck speed and unprecedented levels, China will need more energy—especially renewable energy. While hydroelectricity is considered

renewable, it is controversial because of the significant and permanent impact of hydroelectric dams on the environment.

infrastructure—the underlying foundation of a system or organization, including public resources such as roads, buildings, pipelines, and airports

Given that China is relying on urbanization to fuel the country's economic growth—creating the demand for urban infrastructure, construction, labor, and consumption—management of its water resources will determine China's economic and environmental sustainability. Availability of freshwater, perhaps the most interconnected global system, will determine how both China's environmental devastation and innovation will critically affect the entire planet.

Project Directions and Guidelines

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Examining China's Urbanization: "People-Centered Urbanization" and Hukou Reform

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: "people-centered urbanization" and *hukou* reform. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

People-Centered Urbanization

China's government is caught between competing interests. On one hand, it must encourage urbanization in order to continue to stimulate economic growth. On the other, it must guide the process in a way that ensures China's cities are environmentally comfortable in order to meet the rising middle class desire for a high quality of life. China's higher standard of living (as a result of urbanization) means more money to spend on consumer goods produced within China's economy, leading to economic growth and more jobs. Catch 22: China's industries need energy and resources to manufacture such products. As a result, the increasing stress on China's environment and urban living conditions invite social instability. While China's government, of course, wishes to avoid social unrest and maintain its legitimacy, it must continue to grow the economy in order to provide livelihoods for the Chinese people and development for the country.[57]

legitimacy—authority based on a mandate granted and supported by those affected, especially in the context of political legitimacy of governments

In March 2013, newly inaugurated Chinese Premier Li Keqiang announced, "What we stress is a new type of urbanization that puts the people in the heart. It needs the support of job creation and provision of services."[58] Since China's economic reforms began three decades ago, China's development has been based on the production of goods for

export-led growth—economic growth that is based on revenue generated by exports

consumer-led growth—economic growth that is based on revenue generated by the sale of consumer goods, in this case, domestically

global sale. The model of export-led growth is shifting to consumer-led growth—the production of goods for Chinese to consume domestically. This strategy is expected to narrow the increasingly tense income gap between urban rich and poor and unlock the full potential of China's domestic market.[59] In 2013, outgoing Premier Wen Jiabao remarked, "To expand individual consumption, we should enhance people's ability to consume, keep their consumption expectations stable, boost their desire to consume, improve their consumption environment, and make economic growth more consumption-driven."[60]

industry—production of goods and services; manufacturing

Acceleration of urbanization and expansion of cities, industry, and construction will provide jobs to the increasing flood of rural Chinese migrants, raising their wages so that they can consume goods made in China, which, in turn, will both increase their standard of living and boost the Chinese economy. In addition to the new migrant labor, long-time urban residents will generally benefit from the increased service industry. In 2013, for the first time in China's history, the economy's service sector is expected to overtake its industrial production. The service sector includes, among others, transportation, sales, finance, hotels, and real estate. In 2012, Chinese spent over $370 billion on domestic tourism alone.[61] This shift will be a milestone for China's economy, a welcome switch from its factories and construction renowned for their pollution.[62] The growth in services will also help support China's rising middle class.

China's middle class is expected to more than double by 2025, growing from 300 million to 612 million people.[63] Analysts estimate that China will have 167 million "mainstream" consumer households by 2020, more than 10 times the 14 million who currently have an annual disposable income of between $16,000 and $34,000. There will also be 120 million households with $6,000 to $15,999 of spending power.[64] According to the UNDP, however, about 13% of China's enormous population still survives on less than $1.25 per day, or $440 a year. Averaging all of these numbers brings China's average urban disposable income to $3,500 a year. China has 2.7 million millionaires and 251 billionaires.[65]

UNDP—the abbreviation for the United Nations Development Program

Hukou Reform

Another key aspect of China's "people-centered urbanization" is the reform of China's residence registration or *hukou* ("who-koe") policy, the system that has prevented many of the roughly 800 million Chinese registered as rural residents from enjoying basic urban welfare and services if they move to the city. The income disparity between rural migrants to the city and official urban residents is exacerbated. As migrants are shut out of government-supported health care, education, and social security, they tend to save their relatively meager wages to pay for such services. Money saved is money not spent on consumer goods.[66] In an effort to remedy these issues, China's leaders are planning a new system of national residence permits to replace the old hukou policy; benefits and entitlements for urban residents and rural migrants would be "basically equal."[67]

exacerbate—to make worse

This reform, however, has been delayed primarily due to money. It is estimated that by 2025 an additional $240 billion, or almost 2.5% of China's GDP, will be required to extend public services to migrants across China.[68] This expense, in addition to infrastructure development and pollution cleanup, among many other costs, puts financial issues front and center in China's urbanization strategy.

infrastructure—the underlying foundation of a system or organization, including public resources such as roads, buildings, pipelines, and airports

Project Directions and Guidelines

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Examining China's Urbanization: Clean Technology and Civil Society

Project Summary
Each group in your class will research a different topic relating to China's urban growth and sustainability. Your topic is: clean technology and civil society. You and your groupmates will become "experts" on this topic and then teach your classmates about it through a presentation.

Introduction

China's rapid urbanization has led to a construction phenomenon unlike anything seen in the history of the planet. The scale and pace of development, both physical and economic, present one of the greatest sustainability challenges of the 21st century. As urbanization surges across China, will the majority of humanity squat in slums, squeeze into apartments, sprawl into suburbs, or pioneer innovative ways of sustainable living? As climate change and water scarcity become more serious realities, how will China confront the pressing environmental issues associated with urban growth? And how will China's increasing standard of living and consumption affect demand for domestic and global resources, and have an impact on the planet at large? How China faces the challenges and opportunities of urbanization will profoundly inform and affect the future of all countries on the planet.

Clean Technology

Industrial production has truly fueled China's economic boom. The highest growth in production is generated from three key consumer goods: personal computers, cell phones, and cars.[69] All three of these products, through their cycle of manufacturing, use, and waste, are leading contributors to China's water and air pollution. China's fourth high-growth product is cigarettes, which are harmful to human health. As China's standard of living increases, energy consumption, car ownership and emissions, and obesity also increase. Chinese media, academics, and NGOs estimate that China is home to 459 "Cancer Villages"—small communities near polluting factories where cancer rates have soared far above the national average. They loom across China's provinces except for far western Qinghai and Tibet.[70]

In striking contrast, China has been a major leader in advancing clean technology. Take urban transit, for example: China's bullet trains represent a significant technological breakthrough, as they reduce air pollution and traffic congestion.[71] By 2011, China's high-speed rail network was carrying 370 million passengers annually.[72] China also has become the world's most expansive market for high-speed buses.[73] In the city of Guangzhou alone, a 14-mile stretch has set world records for bus rapid transit, handling 800,000 trips a day, thereby reducing CO_2

NGOs—the abbreviation for non-governmental organizations

bullet trains—modern trains that operate on high-speed railway lines at speeds of up to 350 km/hour (200 mph), which dramatically reduce travel times

bus rapid transit—high speed modern buses that travel on raised dedicated bus lanes, with automated stations, in the center of often congested thoroughfares

CO_2—the chemical symbol for carbon dioxide

emissions by about 20,000 tons a year—equivalent to the amount emitted by about 4,000 cars.[74] In addition, more than 100 million e-bikes have been sold in China over the past decade, in what has been called the "single largest adoption of alternative fuel vehicles in history."[75] In 2011, 30 million e-bikes sold in China in a single year. And processed "gutter oil" (recycled cooking oil) is expected to fuel buses in Shanghai by 2015 as part of an effort to advance a circular economy.[76]

e-bike—electric bicycle; a vehicle similar to the moped but propelled by electric motor and rechargeable battery (instead of by the use of fossil fuel). The battery is recharged through the rider's pedaling.

circular economy—a concept and system modeled in contrast to the more traditional, linear industrial processes and consumptive lifestyles ("Make, Take, Dispose") that are depleting finite resources and increasingly filling landfills. A circular economy is designed to restore ecosystems by producing high-quality goods and services within environmental limits and with renewable energy, which are then recirculated and recycled to create no waste.

Efforts such as these, combined with carbon caps and trading, green design, and eco-city development inevitably will generate new clean technologies. These innovations will be critical to China's economic and environmental sustainability, as well as to the future development of countries across the planet.

Civil Society

China's civil society is adding to the pressure to keep China on an environmentally sustainable path. Concerned primarily with the dangerous impact of pollution on their own and their children's health, individuals in China increasingly are taking to the streets to protest poor environmental stewardship. Since 1996, environmental "mass incidents" such as pollution spills have been growing in number by 29% per year, igniting a reaction from citizens who were affected.[77] The number of major environmental protests in China grew by 120% from 2010 to 2011.[78] The approximately 216,000 protests and riots in 2011 reflect a lack of faith in official participation or aid through legal channels, a desire to voice concerns, and recognition that governmental authorities are under pressure to maintain social stability.[79]

A NIMBY ("not in my backyard") movement has emerged alongside rising public awareness of environmental and legal rights issues, particularly as Chinese residents attempt to protect their neighborhoods from the negative effects of industrial facilities, most notably PX chemical factories.[80] Because of the public opposition, governmental authorities have shelved many projects. However, some environmental analysts are concerned that these projects have been abandoned or delayed primarily to avoid social unrest rather than to clarify and advance environmental assessments and transparent processes.[81] Increases in standards of living and education levels coupled with the phenomenon of employing social media to facilitate public organizing make it clear that China's public will increasingly act on and influence China's environmental decisions and practices.[82,83]

NIMBY—the acronym for "Not in My Back Yard," a movement in protest of environmental or social liabilities in need of a site for construction (such as factories, waste facilities, or prisons)

PX chemical—a petroleum product called paraxylene or p-Xylene, ultimately used in the manufacturing of such products as polyester, and considered a toxin that can have an effect on the central nervous system, reproductive systems, and human development

environmental assessment—a systematic process of evaluating the effects an activity or enterprise could have on the environment, ideally transparent and inclusive of the various stakeholders