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Geographical and Structural Constraints of Regional Development in Western China: A Study of Gansu Province

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There have been heated debates over the extent, causal mechanisms, and consequences of regional inequality in China and the proper policy intervention. The central government considers struggling poorer regions and the widening coastal-interior gap as serious threats to China's prosperity, stability, and unity, and has launched the Great Western Development Strategy. Given the massive scale of the region and its tremendous diversity, more work is needed on regional development in interior China and on how effective the Chinese government has been in developing its western region. This paper broadens the study of regional inequality in

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provincial China by focusing on the poorer western provinces through a case study of Gansu Province. We examine the extent and process of regional development in Gansu and its Hexi Corridor, and investigate the geographical and structural challenges facing a western province. We have found that despite the government's western development policies, huge gaps exist within interior provinces, and intra-provincial inequality and geographical concentration are rising continuously. While acknowledging the efforts and achievements of the government in reducing poverty and promoting the development of the west, we argue that the geography and structural problems of the interior provinces have seriously limited the effectiveness of government policy. The development of poorer regions in China remains a challenging task.

KEYWORDS: **regional development; government policy; western China; Gansu.**

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Concerns over the effects of globalization and liberalization have fueled a renewed interest in regional development and inequality since the early 1990s, facilitated by the developments in economic geography (e.g., new economic geography, institutional economic geography, and cluster theories)[1] and research methods (e.g., geostatistics, spatial analysis, and geographical information systems).[2] Scholars have examined the effects of institutional renovation, globalization, and technological change, and argued for the significance of institutions, agglomeration, regions, and places in regional development. The new economic geography of economists led by Paul Krugman, Jeffrey Sachs, and others, has provided powerful evidence for the significance of geography in economic and regional development, including physical geography (e.g., climate, terrain), location (e.g., coastal proximity), infrastructure (e.g., road density), human capital (e.g., knowledge spillover and population density), policy difference (e.g., policy regions), geographical agglomeration, and

[1]E.g., Ash Amin and Nigel Thrift, eds., *Globalization, Institutions, and Regional Development in Europe* (Oxford: Oxford University Press, 1994).

[2]E.g., Sergio J. Rey and Brett D. Montouri, "U.S. Regional Income Convergence: A Spatial Econometric Perspective," *Regional Studies* 33, no. 2 (1999): 143-56.

spatial clustering, all of which have geographical dimensions.[3] Scholars have also argued that the world economy is a regional world of production and that globalization is contested by regionalization, reterritorialization, and geographical embeddedness. Research on regional inequality in developing countries has provided further evidence of the importance of geography to regional development. Even in the United States, it has been found that economic activity is overwhelmingly concentrated on the coast and around the Great Lakes, reflecting the large contribution coastal proximity makes to productivity and quality of life.[4]

The nature, process, and consequences of reforms in formal socialist countries are a focus of research in the social sciences. Concerns over the effects of globalization and liberalization have also intensified debates over the trajectories and underlying sources of regional inequality in those countries.[5] Such concerns have had a tremendous impact on politics and development policy, as they highlight the battle over development paths and power struggles among decision-makers. There is overwhelming evidence for the persistence of core-periphery structures in developing countries and transitional economies, which, having strong geographical foundations, are difficult to overcome. Core-periphery structures, such as the dominance of Moscow and the Siberian dilemma, are often maintained or even intensified through political control, new structural/spatial division of labor, and the integration of the core regions into the global economy.[6] Empirical evidence in Asia tends to be mixed; although re-

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[3]E.g., Paul Krugman, *Development, Geography, and Economic Theory* (Cambridge, Mass.: MIT Press, 1995); Andrew D. Mellinger, Jeffrey D. Sachs, and John Luke Gallup, "Climate, Coastal Proximity, and Development," in *The Oxford Handbook of Economic Geography*, ed. Gordon L. Clark, Maryann P. Feldman, and Meric S. Gertler (Oxford: Oxford University Press, 2000), 169-94; and John Luke Gallup, Aejandro Gaviria, and Eduardo Lora, *Is Geography Destiny? Lessons from Latin America* (Washington, D.C.: Inter-American Development Bank, 2003).

[4]Jordan Rappaport and Jeffrey D. Sachs, "The United States as a Coastal Nation," *Journal of Economic Growth* 8, no. 1 (March 2003): 5-46.

[5]E.g., George Petrakos, "Patterns of Regional Inequality in Transition Economies," *European Planning Studies* 9 (2001): 359-83; and Steven Rosefielde and Masaaki Kuboniwa, "Russian Growth Retardation Then and Now," *Eurasian Geography and Economics* 44, no. 2 (2003): 87-101.

[6]Michael J. Bradshaw and Jessica Prendergrast, "The Russian Heartland Revisited: An

gional inequality has declined in some countries, it has persisted or even increased in others.[7] The core-periphery structure also tends to be maintained and intensified.

Regional inequality is intertwined with economic growth, social stability, ethnic relations, and political unity, and has always been an important policy issue in China.[8] During both the Mao Zedong (毛澤東) and reform periods, many were concerned over income and spatial inequalities and the development of poorer interior regions. The post-Mao reforms have stimulated economic growth in China, but have also intensified the gaps and conflicts between richer and poorer regions. Since the mid-1990s, in response to the concerns over rising inequality and persistent poverty, the central government has intensified its efforts to develop the interior of China, in particular by launching the Great Western Development Strategy (西部大開發戰略) in 1999.[9] Since then, substantial state resources have been channeled into western China, with massive investment in infrastructure, education, resource development, and environmental protection.

However, China's reform process is spatially uneven, with a strong geographical dimension, and has traditionally emphasized coastal development. Scholars have argued for the importance of geographical proximity to Hong Kong and access to the international market in the location decisions of foreign investors and the development of regions. China's emerging high-tech centers, such as Beijing's Zhongguancun (北京市中關村),

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Assessment of Russia's Transformation," *Eurasian Geography and Economics* 46, no. 2 (2005): 83-122.

[7]E.g., Hal Hill, "Spatial Disparities in Developing East Asia: A Survey," *Asian-Pacific Economic Literature* 16, no. 1 (2002): 10-35; and Takahiro Akita, "Decomposing Regional Income Inequality in China and Indonesia Using Two-Stage Nested Theil Decomposition Method," *Annals of Regional Science* 37, no. 1 (2003): 55-77.

[8]Shaoguang Wang and Angang Hu, *The Political Economy of Uneven Development: The Case of China* (Armonk, N.Y.: M.E. Sharpe, 1999); Yehua Dennis Wei, *Regional Development in China: States, Globalization, and Inequality* (London: Routledge, 2000); and Chen Desheng, ed., *Zhongguo dalu quyu jingji fazhan* (Regional economic development in mainland China) (Taipei: Wunan, 2003).

[9]Hongyi Harry Lai, "China's Western Development Program," *Modern China* 28, no. 4 (October 2002): 432-66; and Yue-man Yeung and Jianfa Shen, *Developing China's West: A Critical Path to Balanced National Development* (Hong Kong: Chinese University Press, 2004).

are characterized by intense networks and institutional support based on geographical closeness and proximity. On the other hand, remote areas of China have been falling behind in economic growth, despite the efforts of the Chinese government to develop the poorer regions.[10] Even coastal cities such as Tianjin (天津市) have a more disadvantaged location than Shanghai (上海市) in competing for global-city status. Institutions do not act in a vacuum, but there are geographical foundations for institutional innovation and state initiatives.[11]

Significant inequalities also exist within the provinces of China, and the underlying reality of regional transformation there cannot be thoroughly understood without the study of intra-provincial inequality and poorer regions. Research on Jiangsu Province (江蘇省) has shown the complexity of regional development, the intensification of the Sunan-Subei (north-south Jiangsu, 蘇南蘇北) divide, and the significance of township and village enterprises (TVEs) and, more recently, foreign investment, in shaping regional inequality.[12] Work on Zhejiang Province (浙江省) has revealed an emerging divide between the coast and the interior, replacing the orthodox northeast-southwest gap, and the impact of private enterprises on regional development.[13] Scholars have now begun to examine the policy of developing the interior of China, which has seen serious effort

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[10]Shuming Bao, Gene Hsin Chang, Jeffrey D. Sachs, and Wing Thye Woo, "Geographic Factors and China's Regional Development under Market Reform, 1978-1998," *China Economic Review* 13, no. 1 (2002): 89-111.

[11]Yehua Dennis Wei, "Beyond the Sunan Model: Trajectories and Underlying Factors of Development in Kunshan, China," *Environment and Planning A* 34, no. 10 (2002): 1725-47.

[12]Guoying Long and Mee Kam Ng, "The Political Economy of Intra-Provincial Disparities in Post-Reform China: A Case Study of Jiangsu Province," *Geoforum* 32, no. 2 (May 2001): 215-34; Yehua Dennis Wei, "Fiscal System, Investment, and Regional Development in Jiangsu Province," *Issues & Studies* 36, no. 2 (March/April 2000): 73-98; Yehua Dennis Wei and Sunwoong Kim, "Widening Inter-County Inequality in Jiangsu Province, China, 1950-95," *Journal of Development Studies* 38, no. 6 (August 2002): 142-64; and Yehua Dennis Wei, "Trajectories of Ownership Transformation in China: Implications for Uneven Regional Development," *Eurasian Geography and Economics* 45, no. 2 (2004): 90-113.

[13]Yehua Dennis Wei and Xinyue Ye, "Regional Inequality in Provincial China: A Case Study of Zhejiang," *Tijdschrift voor Economische en Sociale Geografie* (Journal of Economic and Social Geography) 95, no. 1 (2004): 44-60; and Xinyue Ye and Yehua Dennis Wei, "Geospatial Analysis of Regional Development in China: The Case of Zhejiang Province and the Wenzhou Model," *Eurasian Geography and Economics* 46, no. 6 (2005): 445-64.

and financial aid directed toward the west,[14] and the challenges of poverty reduction and sustainable development.[15] However, given the massive scale of the interior and the region's tremendous diversity, more work is still needed, particularly on intra-provincial inequality.

This paper looks at regional inequality in provincial China by focusing on the poorer western province of Gansu (甘肅省). As part of the Xi-Long-Hai-Lan-Xin (西隴海蘭新) development belt,[16] one of the three key western development belts designated by the central government, Gansu is at the forefront of China's Western Development Strategy. Gansu has traditionally been a key province in western China, traversed by the Silk Road (絲路) and containing such gateway cities as Lanzhou (蘭州市), Zhangye (張掖市), and Dunhuang (敦煌市). The province is in a strategic central location in northwestern China, bordering on the provinces/regions of Xinjiang (新疆維吾爾族自治區), Qinghai (青海省), Sichuan (四川省), and Inner Mongolia (內蒙古自治區), all of which have sizable ethnic minority populations and whose autonomous regions tend to be unstable. Gansu Province is also known for its environmental problems and substantial intra-provincial inequality. While the provincial capital Lanzhou has become a key industrial city of China, the province also contains some of the country's poorest areas. The development of Gansu and its intra-provincial inequality are therefore significant subjects for investigation. This paper examines the extent and process of regional development in Gansu and the challenges facing the western province. We also compare Gansu with coastal provinces, in particular Zhejiang and Jiangsu, with

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[14]Lai, "China's Western Development Program"; and Barry J. Naughton, "The Western Development Program," in *Holding China Together: Diversity and National Integration in the Post-Deng Era*, ed. Barry J. Naughton and Dali Yang (Cambridge: Cambridge University Press, 2004), 1-25.

[15]Peter Ho, "The Wasteland Auction Policy in Northwest China: Solving Rural Poverty and Environmental Degradation?" *Journal of Peasant Studies* 30, nos. 3/4 (April/July 2003): 121-59; and Rita Merkle, "Ningxia's Third Road to Rural Development: Resettlement Schemes as a Last Means to Poverty Reduction?" ibid., 160-91.

[16]The Xi-Long-Hai-Lan-Xin development belt extends from Shaanxi's Tongguan (陝西省潼關市) in the east to the northwestern border of Xinjiang, which is part of the Eurasian "Land Bridge" (歐亞大陸橋).

regard to the trajectories and limits of regional development. We argue that geography and structural problems have seriously limited the effectiveness of government policy, and that the development of poorer regions remains a challenging task. In the following section, we first review and analyze China's regional development and policies toward the western region in order to properly situate Gansu in the context of China's changing political economy and government policy.

China: Regional Development and the Western Region

Regional inequality has been an important issue in China during both the Mao and post-Mao periods. Influenced by Marx's socialist ideology and egalitarian ideas, Mao, during the First Five-Year Plan period (1953-57), allocated state investment to rebuild the coastal industrial bases, such as Shanghai and Liaoning (遼寧省), and to establish new ones in the interior. Investment in interior China was intensified with the implementation of the Third Front Program[17] in 1964, which was aimed at preparing China for a potential foreign invasion. While Jiangsu and Zhejiang were starved of investment, many interior provinces, including Gansu, Henan (河南省), Hubei (湖北省), Hunan (湖南省), and Sichuan, experienced a massive inflow of state investment and defense buildup, though the economic returns were poor. With the normalization of U.S.-China relations under way in the early 1970s, state investment began to shift gradually away from the interior, as evidenced by the allocation of imported industrial equipment to the coastal cities. Meanwhile, decentralization laid the foundation for the development of TVEs in the coastal provinces. Recent work using newly released data has shown the persistence of regional inequality under Mao, which was due largely to the uneven geographical

[17]Under this program, China was divided into three strategic fronts. The First Front was the coastal and northeastern provinces that would be the first to face attack in a war. The Third Front included the vast interior region south of the Great Wall (長城) and west of the Beijing-Guangzhou railway. The areas in between were the Second Front.

distribution of resources, policy failure with industrialization and national defense, and decentralization. Under Mao's regime, interior investment was inefficient, while the industrial bases of the coastal region were not effectively utilized, and this hindered China's economic growth.[18]

After the launch of the reforms in the late 1970s, and especially during the 1980s and early 1990s, China encouraged some regions to "get rich first" and emphasized coastal development. The government argued that concentration and specialization were required for rapid economic growth, and diffusion from the more developed coastal regions would stimulate the prosperity of the whole country, including the poorer regions. Since the reforms, a group of coastal provinces, including Guangdong (廣東省), Fujian (福建省), Zhejiang, Jiangsu, and Shandong (山東省), have led the nation in economic growth, while many western provinces have lagged behind.[19] The reform and opening-up policies and the coastal development strategy have been especially favorable to the coastal region. Moreover, the coastal provinces are benefiting from multinational enterprises expanding their production to developing countries, and as a consequence they are much better integrated into the global economy. Local efforts and entrepreneurship are also critical to coastal development, as research on southern Jiangsu and Wenzhou (溫州) has found.[20]

Struggling poorer regions and a widening coastal-interior gap have prompted many to consider regional inequality as the root of China's regional problems and an important issue for government policy. Ethnic unrest in Xinjiang, for example, is intertwined with the divide between the north, where state farms, most of the Han (漢族) population, and almost all the industrial capacity are located, and the south, which remains

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[18]Wei, *Regional Development in China*, 67-97.

[19]Ibid.; and Danlin Yu and Yehua Dennis Wei, "Analyzing Regional Inequality in Post-Mao China in a GIS Environment," *Eurasian Geography and Economics* 44, no. 7 (2003): 514-34.

[20]Laurence J.C. Ma and Gonghao Cui, "Economic Transition at the Local Level: Diverse Forms of Town Development in China," *Eurasian Geography and Economics* 43, no. 2 (2002): 79-103; Wei, "Beyond the Sunan Model"; and Ye and Wei, "Geospatial Analysis of Regional Development in China."

overwhelmingly rural and settled by ethnic minorities.[21] Indeed, broad concerns exist over declining state capacity, weak economic institutions, regional problems, inequality, and potential disintegration. The significance of the western region for China's national security and unity has further increased the importance of developing western China. Initial ideas about interior development and a proper coastal-interior division of labor were proposed in the Eighth Five-Year Plan (1991-95). In the mid-1990s, the central government became increasingly concerned about the widening coastal-interior gap, rural poverty, and national unity. In 1993, the State Council (國務院) decided to provide 5 billion *yuan* in loans annually from 1994 to 2000 for TVE development in the interior, and in 1995, the Agricultural Bank of China approved annual loans of 10 billion *yuan* for these TVEs.[22] The Ninth Five-Year Plan (1996-2000) perceived polarization as a serious threat to China's prosperity, stability, and unity, and made reducing regional inequality and promoting interior development top policy priorities.

The resources committed to interior development, however, were insufficient to narrow the coastal-interior gap in the 1990s. With the intensification of regional inequalities and rising state revenue from phenomenal economic growth, the efforts to develop the interior intensified in the late 1990s. In 1999, the central government launched the Great Western Development Strategy, highlighting ten investment projects and giving priority to infrastructure, education, energy and industrial development, environmental protection, and institutional reform. Since then, under the leadership of the State Council Leading Group on Western Development (國務院西部地區開發領導小組) headed by Premier Zhu Rongji (朱鎔基), China has made tremendous efforts. Many interior areas have been opened up for foreign investment, and substantial resources and investment have

[21]Nicolas Becquelin, "Xinjiang in the Nineties," *The China Journal*, no. 44 (July 2000): 65-90.

[22]Wei Houkai, "Regional Development Strategy and Regional Policy," in *Zhongguo quyu fazhan de lilun yu shijian* (Theory and practice of China's regional development), ed. Lu Dadao (Beijing: Kexue chubanshe, 2003), 109-34.

been allocated to the western region. Since the mid-1990s, the central government has allocated more than 10 billion *yuan* for poverty reduction, and in 2004, the state announced a 10 billion *yuan* education plan for the western region. A substantial amount of state investment and subsidies has also been allocated for infrastructure and industrial development, including about 200 billion *yuan* for west-east electricity and gas transportation. In 2003, infrastructure investment in the western region alone reached 200.8 billion *yuan*.[23] From 2000 to 2004, the central government's fiscal allocation and subsidies to the western region reached 960 billion *yuan*, and the sixty key-point projects had a total investment of 850 billion *yuan*.[24]

Are the interior provinces catching up with their counterparts on the coast? Has the map of China's rich and poor provinces been changed? While it remains too early to assess the effects of western development policies and a full assessment of the complex program is beyond the scope of this paper, it is clear that massive investment in infrastructure development and resource exploration has significantly improved the infrastructure conditions of the interior. The poor areas are also improving basic education and health care, and the poverty rate in rural China declined from 30.7 percent in 1978 to 3 percent in 2000.[25] However, scholars have questioned the effectiveness of the western development policies,[26] and many remain concerned that globalization and liberalization are challenging China's interior development. The western drive has encountered economic, political, cultural, and ecological obstacles, including corruption, poor management, ethnic conflicts, economic inefficiency, and ecological degradation.[27] The policy of developing TVEs in the interior, for example, has not

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[23]"Western Region Entering a Period of Fastest Economic Growth," *Renmin ribao* (People's Daily, overseas edition), March 18, 2004.

[24]"An Overview of the Five-Year Achievement of the Great Western Development," February 5, 2005, http://finance.sina.com.

[25]Liu Hui, "Agriculture, Rural Modernization, and Regional Development," in Lu, *Zhongguo quyu fazhan de lilun yu shijian*, 163-93.

[26]See note 15 above.

[27]Lai, "China's Western Development Program"; and Qunjian Tian, "China Develops Its West: Motivation, Strategy, and Prospect," *Journal of Contemporary China* 13, no. 41 (November 2004): 611-36.

been as effective as expected, since most of the TVEs were not embedded in the local economy, produced few benefits for the local population, and burdened the villages with crippling debts;[28] even in coastal China TVEs have been undergoing restructuring and privatization in order to meet the new demands of globalization and liberalization.[29] The interior provinces have also suffered a massive out-migration of the workers and skills needed to catch up with the coastal region and prepare for global competition.

A further analysis of provincial growth rates of per capita GDP can shed more light on uneven regional development in China. In 1978, the centrally administrated municipalities and some of the industrial provinces had the highest per capita GDP, followed by selected coastal and interior provinces (most of these are resource-based or have special political significance, such as Qinghai, Xinjiang, and Xizang [Tibet], 西藏自治區), while provinces in the southwest were the poorest. Since then, the coastal region has recorded faster growth than the interior region, and a group of coastal provinces has emerged as leaders, contributing to the coastal-interior divide (see table 1). Since 1990, the coastal provinces have continued to grow faster than the interior provinces, and the municipalities have also recovered, while interior provinces lagged behind (see table 1). The gap between the coastal and interior regions increased dramatically during the period 1978-2000.[30] By 2002, the provinces with the highest per capita GDP were all coastal in location, while the poorest provinces were located in the interior region. The western region, encompassing 72 percent of the total land area of China, only produced 13.5 percent of China's GDP. More than half of those in poverty reside in western China. In 2003, the growth rates of western provinces accelerated to some extent, with Inner Mongolia recording a growth rate of per capita GDP of 16.3 percent, the highest among China's provinces.

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[28]Jacob Eyferth, "How Not to Industrialize: Observations from a Village in Sichuan," *Journal of Peasant Studies* 30, nos. 3/4 (April/July 2003): 75-92.

[29]Our fieldwork in Sichuan in November 2003 revealed the huge debts of many small towns, mainly due to failed investment in TVEs.

[30]Yu and Wei, "Analyzing Regional Inequality in Post-Mao China," 516-25.

Table 1
Growth Rates of Selected Provinces in China, 1978-2002

	GDP Per Capita (*Yuan*)*			Average Annual Growth Rate (%)	Average Annual Growth Rate (%)
	1978	1990	2002	(1978-90)	(1990-2002)
China	368	898	3,170	7.7	11.1
Eastern (Coastal) Region	466	1,199	4,792	8.2	12.2
Jiangsu (江蘇省)	430	1,300	5,574	9.7	12.9
Shanghai (上海市)	2,498	5,052	19,056	6.0	11.7
Zhejiang (浙江省)	331	1,105	5,287	10.6	13.9
Central Region	313	719	2,207	7.2	9.8
Heilongjiang (黑龍江省)	564	1,092	2,767	5.7	8.1
Neimenggu (內蒙古自治區)	317	822	2,350	8.3	9.1
Shanxi (山西省)	363	784	2,125	6.6	8.7
Hubei (湖北省)	330	820	2,757	7.9	10.6
Western Region	266	633	1,722	7.5	8.7
Sichuan (四川省)	262	617	1,830	7.4	9.5
Guizhou (貴州省)	175	419	1,032	7.5	7.8
Yunnan (雲南省)	226	572	1,452	8.0	8.1
Xizang (西藏自治區)	375	725	2,170	5.6	9.6
Shaanxi (陝西省)	291	711	1,921	7.7	8.6
Gansu (甘肅省)	**348**	**757**	**1,960**	**6.7**	**8.3**
Qinghai (青海省)	428	737	1,815	4.6	7.8
Ningxia (寧夏回族自治區)	370	843	1,902	7.1	7.0
Xinjiang (新疆維吾爾族自治區)	313	880	2,213	9.0	8.0

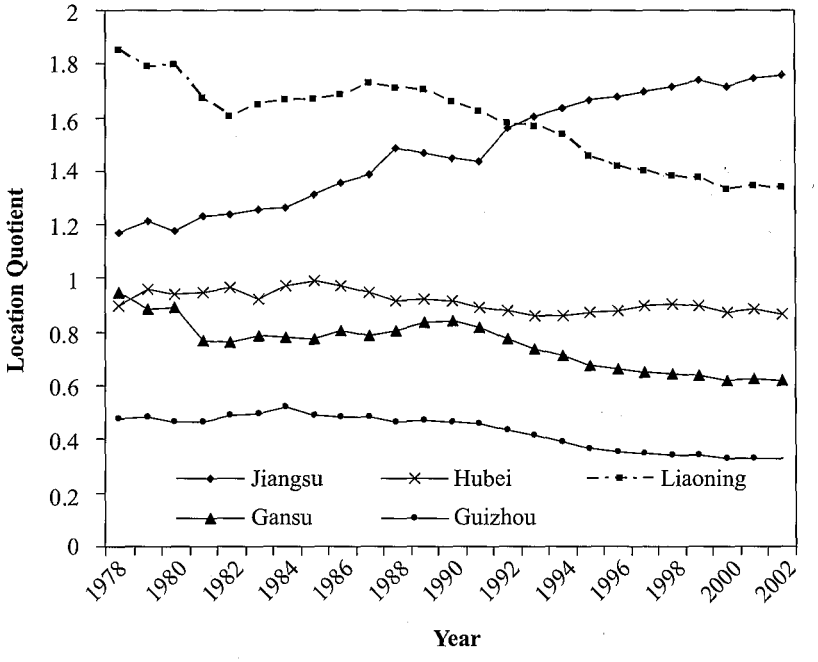
Note: *In real prices.

Sources: National Bureau of Statistics, *Xin Zhongguo wushi nian tongji ziliao huibian* (A compilation of statistical materials for fifty years of new China) (Beijing: Zhongguo tongji chubanshe, 1999); and National Bureau of Statistics, *Zhongguo tongji nianjian* (Statistical yearbook of China) (Beijing: Zhongguo tongji chubanshe, 2003).

As shown in figure 1, the location quotient (LQ)[31] for Jiangsu, representing the coastal provinces that have benefited most from China's reforms, has risen dramatically along with its status in the national economy. The central provinces (represented by Hubei) have remained relatively stable. The status of the northeastern provinces (Liaoning), which were

[31]Location quotient can be used to represent the relative status of a region's economy.

Figure 1
Location Quotients* of Gansu and Selected Provinces†



***Location quotient (LQ)** here is calculated as the ratio of a region's per capita GDP (or gross regional product) to national per capita GDP. An **LQ** of more than 1 indicates a province's per capita output is larger than the average.

†These represent five groups of provinces based on geography and changing patterns of LQ.

favored by Mao's industrialization policy, was eroded during the reform period. The status of the northwestern (Gansu) and southwestern provinces (Guizhou, 貴州省) has declined substantially, and their LQs declined further after the mid-1990s, indicating that central government policies slowed but did not stop their declining status. The interior economies dominated by state-owned enterprises (SOEs) and resource-hungry heavy industry have been challenged by non-state domestic and foreign enterprises in coastal provinces. These data show that although the interior provinces are benefiting from economic reforms, the gap between them and coastal China remains large.

Moreover, the Western Development Strategy is spatially uneven, and significant differences can be found not only across but also within each of the western provinces.[32] The policy favors certain regions, especially key cities and provincial capitals like Chongqing (重慶市), Wuhan (武漢市), Xi'an (西安市), Chengdu (成都市), Lanzhou, and Kunming (昆明市). The massive infusions of state capital and urban construction have made the urban landscapes of these cities as developed as major coastal cities, while many rural areas are still troubled by persistent poverty and underdevelopment. Although the policy promotes interior development, the gap between booming cities and the poor countryside within the interior provinces has been growing, and some regions are still troubled by poverty. Substantial regional differentials, therefore, can also be observed among the interior provinces. A study of Gansu may help us to better understand the complex patterns and mechanisms of regional development within the diverse provinces of western China. The following sections analyze regional development in Gansu within the context of China's western development policies.

Geographical Foundations: Development Process of Gansu

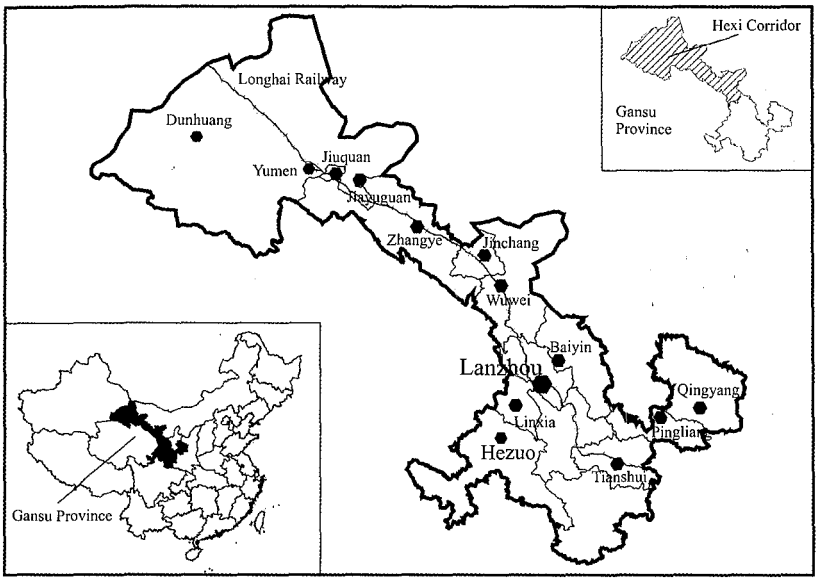
Gansu has a land area of 454,430 square kilometers (4.73 percent of China's territory), and a population of 25.93 million in 2002, accounting for 2.02 percent of China's population. Connecting the northwest with the southeast of the province is the Hexi Corridor (河西走廊), along which the Silk Road ran, with forbidding mountains on the southwest and menacing deserts to the northeast (see map 1).[33]

The central and eastern regions of Gansu were relatively well developed, especially during the Han (漢朝, 206 B.C.-A.D. 220) and Tang

[32]David S.G. Goodman, "The Campaign to 'Open Up the West': National, Provincial-Level, and Local Perspectives," *The China Quarterly*, no. 178 (June 2004): 317-34.

[33]A. Doak Barnett, *China's Far West: Four Decades of Change* (Boulder, Colo.: Westview, 1993).

Map 1
Location of Gansu Province and the Hexi Corridor



(唐朝, 618-907) dynasties when in-migration and irrigation systems improved land productivity and the Silk Road brought in trade and commercial activities. However, Gansu was troubled by wars and a deteriorating physical environment after the late Tang Dynasty.[34] Furthermore, China's political and economic center of gravity moved to the southeast during the Southern Song Dynasty (南宋, 1127-1279), and during the Ming Dynasty (明朝, 1368-1644), the Silk Road was replaced by marine transport. These factors contributed to the steady decline of northwestern China, although in-migration during the Ming Dynasty did enhance agricultural production in the province. With the diffusion of Western capitalism to interior China in the middle and late 1800s, some modern industries were established in Gansu, especially in Lanzhou, the provincial capital.

[34]Zheng Baoxi, Pan Chen, and Zhu Zuoyong, eds., *Gansusheng jingji dili* (Economic geography of Gansu Province) (Beijing: Xinhua chubanshe, 1987).

Table 2
Selected Indicators of Gansu, 1952-2002

	Gansu	China
Per Capita GDP (Current Price)		
1952 (*yuan*)	125	119
1978 (*yuan*)	348	379
2002 (*yuan*)	4,493	8,184
1952-78 average annual growth (%)	3.7	4.0
1978-2002 average annual growth (%)	7.5	9.4
2002 Population (Million)	25.9	1,284.5
2002 Per Capita		
Local revenue (*yuan*)	590	1,472
Local expenditure (*yuan*)	1,057	1,717
Fixed asset investment (*yuan*)	2,233	3,386
Foreign direct investment (US$)	8.7	41.1

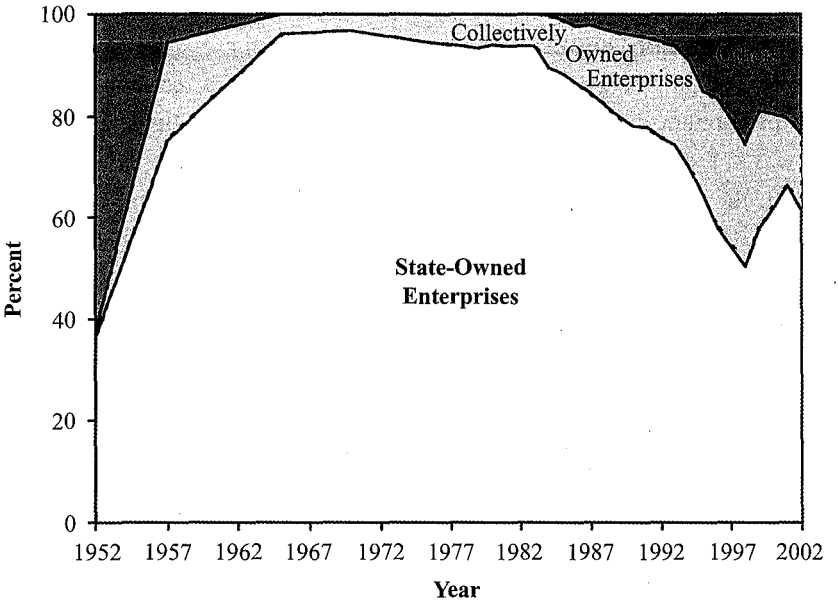
Sources: Gansu Provincial Bureau of Statistics, *Gansu nianjian* (Gansu yearbook) (Beijing: Zhongguo tongji chubanshe, 2003); National Bureau of Statistics, *Xin Zhongguo wushi nian tongji ziliao huibian* (1999); and National Bureau of Statistics, *Zhongguo tongji nianjian* (2003).

When the People's Republic of China was founded in 1949, like other provinces, Gansu's economy was dominated by agriculture. In 1952, the primary sector produced 65 percent of the GDP, similar to Zhejiang (68 percent). In the same year, per capita GDP in Gansu was 125 *yuan*, slightly above the national average and that of Zhejiang (see table 2). Like many other provinces, Gansu's industrial base was weak. In the 1950s, Mao invested in major industrial centers in both coastal and interior China. Of the 156 key-point projects imported from the Soviet Union, 16 were allocated to Gansu,[35] and built upon the rich natural resources of the province. Gansu had 1.27 million net migrants, mainly engaged in industrial production.[36] A group of large-scale SOEs, many in the heavy industry sector,

[35]Contemporary China Editorial Committee, *Dangdai Zhongguo de Gansu* (Contemporary China's Gansu) (Beijing: Dangdai Zhongguo chubanshe, 1992).

[36]Su Runyu et al., eds., *Zhongguo renkou: Gansu fence* (Population in China: volume on Gansu) (Beijing: Zhongguo caizheng jingji chubanshe, 1988).

Figure 2
Changing Industrial Output Structure by Ownership in Gansu



were established, contributing to the rising share of SOEs in the provincial economy (see figure 2). However, due to its remote location and the inefficiency of socialist industrialization, economic growth was slow in Gansu. Its location quotient based on national income per capita declined from 96 in 1952 (slightly lower than the national average) to 64 in 1960, among the lowest in China, and higher only than Guangxi (廣西壯族自治區, 47), Sichuan (48), Anhui (安徽省, 52), Guizhou (53), and Jiangsu (57).[37]

During the Third Front period (1964-71), southeastern Gansu, centered on Lanzhou, was considered part of the Third Front, the safest place in the event of a foreign invasion. Influenced by the national defense policy, investment was directed into defense-oriented industries, and mas-

[37]Wei, *Regional Development in China*, 36.

sive investment was allocated to Lanzhou. Despite poor investment returns, SOEs and heavy industry dominated Gansu's economy. In 1970, 96.8 percent of industrial output in Gansu was produced by SOEs, which was a substantially higher proportion than that of the coastal provinces and the national average (87.7 percent). Despite poor investment returns, such investment did help Gansu retain its status within China, although this was at the expense of light industry and the service sector.

In the early 1970s, with the normalization of its relations with the United States under way, China reduced its emphasis on self-reliance and national defense. Moreover, with decentralization and Mao's encouragement of rural industrialization, many TVEs were established in coastal provinces. While in these provinces the share of SOEs in industrial production declined dramatically, Gansu was slow in developing TVEs, and its economy was still dominated by SOEs. In 1978, SOEs still produced 90.7 percent of industrial output, while their shares in Jiangsu and Zhejiang were 61.8 percent and 60.3 percent, respectively.[38]

During the Mao era, Gansu's average annual growth rate of per capita GDP was only 3.7 percent. Although still higher than many interior provinces, this rate was lower than the average of 4 percent due to the more rapid growth of centrally administrated municipalities and key industrial bases (e.g., Liaoning). Location quotients based on per capita national income declined from 96 in 1952 to 86 in 1978, indicating that Gansu's economic status dropped from slightly below the national average to much further below.[39] Gansu's economy was heavily controlled by the state sector and was less decentralized and market-oriented than the coastal provinces. The formation of such structural features was clearly related to geographical advantages in natural resources. The government policy for Third Front construction and interior development was also based on geography. The development process of Gansu proves that government policy and regional economic structure have strong geographical founda-

[38]Ibid., 105.
[39]Ibid., 36.

tions. Geographical and structural features have further handicapped Gansu's development in the post-Mao period.

Post-Mao Development: Geographical and Structural Constraints

In the reform period, while the role of the state is still important, the control and capacity of the central state have been declining. Meanwhile, as a consequence of global restructuring and economic reforms emphasizing decentralization, marketization, and globalization (open-door policy), localities and global investors have emerged as important agents shaping regional development in China. Since the reforms, China's coastal provinces have recorded dramatic growth, while the interior provinces have lagged behind. Gansu's annual average growth rates of 6.7 percent during 1978-90 and 8.3 percent during 1990-2002 were among the lowest in provincial China. Gansu's GDP per capita increased from 348 *yuan* in 1978 to 4,493 *yuan* in 2002 (see table 2).

The Western Development Strategy has brought more investment to Gansu. In 1998, state budgetary investment in Gansu reached 2.65 billion *yuan*, with per capita investment of 105 *yuan*, ranking fourth among western provinces and much higher than the national average (86.7 *yuan*).[40] From 1999 to mid-2003, forty large-scale technological updating projects received low-interest loans from the central government, which made a total investment of 12.37 billion *yuan*.[41] By the end of 2003, the accumulative loans for industrial, infrastructure, and urban development from the Development Bank of China reached 30 billion *yuan*. The west-to-east natural gas transportation project planned to invest 40 billion *yuan* in Gansu. In 2003, forty-one itemized development policies in taxation,

[40]Huang Sujian and Wei Houkai, eds., *Xibu dakaifa yu dongzhongbu diqu fazhan* (The great western development and the development of eastern and central regions) (Beijing: Jingji guanli chubanshe, 2001).

[41]"Gansu Emphasizes Implementing Industry-Strengthening-Province Strategy," *Renmin ribao* (overseas edition), July 24, 2003.

loans, land use, resource development, opening-up, human capital, and investment environment were implemented.

However, geographical constraints and the SOE-dominated economy have provided Gansu with a more rigorous environment in which to carry out reforms. The province's difficulties were exacerbated by the higher-than-average contribution of heavy industry to the province's industrial output (81.3 percent). The traditional socialist plan had a larger role to play through its state apparatus, as it did in other provinces favored by Maoist policies, such as Liaoning. Gansu and other SOE-dominated provinces faced tremendous problems in reforming SOEs and nurturing non-state enterprises. Although most SOEs were in poor condition and lost money, they at least provided some job and financial security, and thus Gansu was slow in reforming them and dismantling orthodox socialist institutions.

As early as 1984, SOEs were no longer the largest sector in the Zhejiang economy, but in Gansu, they still produced 75 percent of industrial output in 1990 (see figure 2). Even in 2002, when SOEs were no longer the major sector in many provinces of China, they were still the largest sector in Gansu, producing 36 percent of industrial output. Limited liability companies and stockholding enterprises, many of which are controlled by the state, together accounted for 29 percent of output, and SOEs and state-controlled shareholding enterprises produced 61.3 percent. Most of these enterprises were engaged in heavy industry, which produced 75.9 percent of industrial output. Moreover, enterprises controlled by the central government accounted for 34 percent of industrial output, but had a growth rate of merely 1.89 percent.[42] The SOEs had the slowest growth rate at 2.94 percent, followed by limited liability companies (8.04 percent). Even in 2004, SOEs and state-controlled shareholding enterprises produced 66.87 percent of industrial output, with 15.09 percent produced by private enterprises.[43] With this big burden of troubled SOEs, Gansu's economic growth has remained among the slowest in China.

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[42]Gansu Provincial Bureau of Statistics, *Gansu nianjian* (Gansu yearbook) (Beijing: Zhongguo tongji chubanshe, 2003), 286-89.

[43]*Gansu nianjian* (2005), 263.

Unlike Jiangsu, where local governments were directly involved in the establishment and management of TVEs in the 1970s and 1980s, local authorities in Gansu have been less active in initiating reforms and promoting the development of non-state enterprises. While coastal provinces like Zhejiang have been going down the "capitalist road" smoothly, Gansu has been slow to adapt to the market economy. SOEs have long been the focus of provincial and local government policies, while the development of private enterprises faces many institutional barriers, such as sectoral barriers to entry, a slow approval process, chaotic administrative fees, difficulty in obtaining bank loans, and poor government service. Only in 2005 did the provincial government begin to become more serious toward private enterprises, and announced new measures to promote their development. These points will also be discussed in the section on the development of the Hexi Corridor.

While globalization and the infusion of foreign investment have facilitated the growth of coastal provinces, foreign investment in Gansu remains limited. Although four special economic zones (SEZs, 經濟特區) were opened in 1980 in Guangdong and Fujian provinces, and fourteen coastal cities were opened in 1984,[44] Gansu was basically closed to foreign investment in the 1980s, partly due to its remote location. Even in 1990, the value of foreign direct investment (FDI) in the province was only US$1 million, only higher than that of Tibet and Qinghai. With high altitudes and severe physical constraints to development, Tibet and Qinghai are two of the poorest provinces in China. In 2002, FDI in Gansu was only US$61.2 million, ranked the fifth lowest in China and substantially smaller than the US$1.02 billion attracted by Kunshan (崑山市), a county-level city in Jiangsu Province. Its per capita FDI of US$8.7 was considerably lower than the average for China as a whole (see table 2).[45]

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[44]The four SEZs are: Shenzhen (深圳), Zhuhai (珠海), Shantou (汕頭), and Xiamen (廈門). The fourteen coastal open cities are: Dalian (大連), Qinghuangdao (秦皇島), Tianjin, Qingdao (青島), Yantai (煙台), Lianyungang (連雲港), Nantong (南通), Shanghai, Ningbo (寧波), Wenzhou, Fuzhou (福州), Guangzhou (廣州), Zhanjiang (湛江), and Beihai (北海).

[45]During a visit to Lanzhou's High-Tech District in September 2003, the primary author noticed that the district was heavily involved in real-estate development and domestic

As in the coastal provinces, development within Gansu has been uneven. In Jiangsu, inter-regional inequality increased only slightly during 1978-85, because when rural reform was emphasized, the growth of southern Jiangsu was matched by agricultural improvement in northern Jiangsu. Since the launch of the urban reform and opening-up policy in the mid-1980s, inter-regional inequality has been intensified in the province. In Zhejiang, inter-prefectural and rural inter-county inequality increased rapidly during the reform period.[46] Gansu is one of the provinces with a high level of regional inequality. The coefficient of variation was 0.94 in 1995, higher than most of the other provinces in China (Zhejiang: 0.64; Jiangsu: 0.93), and it rose to 0.99 in 2002. From 1995 to 2002, Moran's I rose drastically from 0.29 to 0.46, indicating further concentration of development in more developed regions.[47]

The status of Lanzhou, the provincial capital, has risen dramatically. Lanzhou, located in southeast Gansu with better access to coastal China, was favored for state investment and industrialization during the Mao era, and quickly emerged as one of the major industrial centers of China. From 1953 to 1957, the population of Lanzhou increased by 113.6 percent, from 373,600 to 797,000.[48] During the reform period, Lanzhou has been a focal point of interior investment and development. In 1994, Lanzhou's industrial output value was 28.1 billion *yuan*, which accounted for 42.8 percent of the industrial output of Gansu.[49] In 2002, Lanzhou's industrial output and GDP accounted for 42.1 percent and 33.3 percent of Gansu's total, respectively. Urban areas of the province had higher per capita

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enterprises, with very few foreign-invested enterprises. The district administrative office was bureaucratic and did not have professional and effective support like those in the Yangtze delta (長江三角洲).

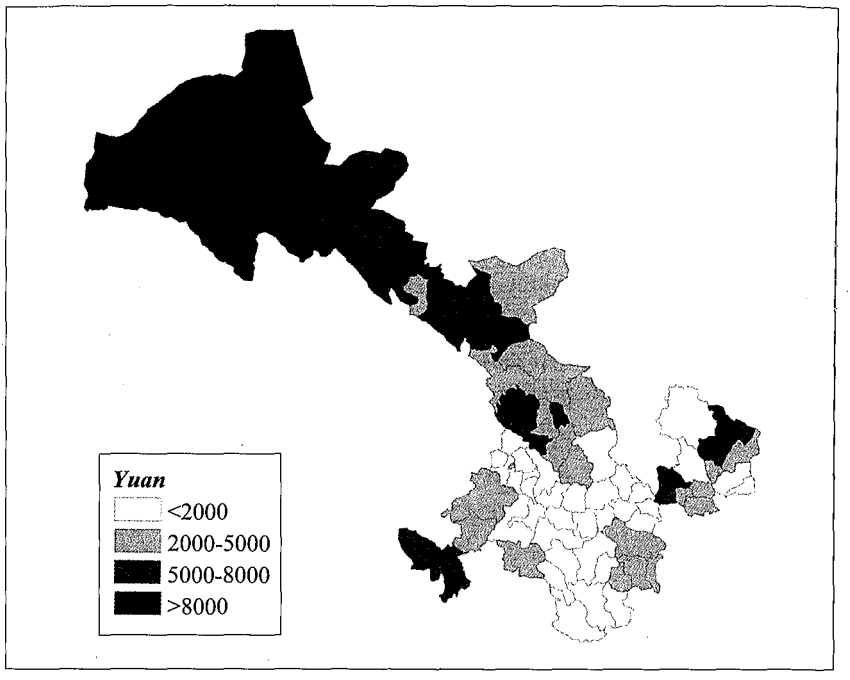
[46]Wei and Ye, "Regional Inequality in Provincial China."

[47]Moran's I is a weighted spatial autocorrelation coefficient used to detect departures from spatial randomness, indicating spatial patterns, such as agglomeration and clusters.

[48]National Bureau of Statistics, *Zhongguo chengshi sishi nian* (China: forty years of urban development) (Beijing: China Statistical Information and Consultancy Service Center, 1990).

[49]National Bureau of Statistics, *Zhongguo chengshi tongji nianjian* (Urban statistical yearbook of China) (Beijing: Zhongguo tongji chubanshe, 1995), 178.

Map 2
Per Capita GDP in Gansu, 2002



GDPs, with Lanzhou's Xigu District (西固區) having a per capita GDP of 29,772 *yuan* (see map 2). Counties with a higher per capita GDP were Akesai (阿克塞哈薩克族自治縣, 20,147 *yuan*), Subei (肅北蒙古族自治縣, 16,192 *yuan*), and Anxi (安西縣, 8,374 *yuan*), while the poorest counties were Lixian (禮縣, 885 *yuan*), Tanchang (宕昌縣, 905 *yuan*), Zhangjiachuan (張家川回族自治縣, 936 *yuan*), Dongxiang (東鄉族自治縣, 980 *yuan*), and Jishishan (積石山保安族東鄉族撒拉族自治縣, 986 *yuan*). Per capita GDP in Akesai was 23 times that of Lixian. Most of the poor counties are located in mountainous, isolated areas of the far south of Gansu, with little industry. The poorest counties have become spatially more concentrated. In 1995, six of the bottom ten counties based on a comprehensive development index were located in the three poorest cities/prefectures of Longnan (隴南市), Linxia (臨夏回族自治州), and Gannan

(甘南藏族自治州), and in 2003, nine of the bottom counties were located there.

Local Geographies of Development: The Hexi Corridor

The Hexi Corridor (or the Hexi region) of Gansu refers to the areas west of the Yellow River (黄河), specifically Wushaoling (烏鞘嶺) and north of the Qilian Mountains (祁連山) (see map 1). It includes five prefecture-level cities (previously, prefectures)—Jiayuguan (嘉峪關市), Jinchang (金昌市), Jiuquan (酒泉市), Zhangye, and Wuwei (武威市), with a total of twenty county-level units. The Hexi region occupies a strategic position in both Gansu and China as a whole because it is part of the Xi'an-Lanzhou-Urumqi (烏魯木齊) development corridor, one of China's core areas for western development. It is traversed by the Silk Road and the Eurasian Railroad and it is a base for China's aerospace, energy, and materials industries. It is also known for its environmental problems, and is one of five major sources of the sandstorms that affect Beijing. In 2001, the region had a land area of 276,000 square kilometers, or 60.4 percent of Gansu's total land area, and a population of 5.2 million, which accounted for 20.4 percent of Gansu's total population (see table 3). In 1998, per capita net income for peasants was 2,517 *yuan*, higher than the provincial average (1,124 *yuan*). In 2001, GDP in Hexi was 34.45 billion *yuan*, and accounted for 32.1 percent of Gansu's GDP.

The Hexi region is a major agricultural base of northwestern China, especially Gansu. The policy of the central government has been instrumental to the development of the Hexi region. During the Mao era, especially in the 1960s and 1970s, Hexi improved its agriculture with the construction of irrigation systems. Agricultural development efforts were stepped up during the reform period through the improvement of land conditions and the use of agricultural technology. Although fluctuating from year to year, the primary sector in the Hexi region generally accounted for about 40 percent of Gansu's primary sector production (42.3 percent

Table 3
Selected Indicators of Hexi, 2001

	Hexi	As % of Gansu
Land area (km^2 in thousand)	276	60.4
Population (million)	5.20	20.4
GDP (billion *yuan*)	34.45	32.1
Primary sector output (billion *yuan*)	8.76	42.3
Secondary sector output (billion *yuan*)	15.77	32.8
Tertiary sector output (billion *yuan*)	10.2	26.5

Source: Gansu Provincial Bureau of Statistics, *Gansu nianjian* (Gansu yearbook) (Zhongguo tongji chubanshe, 2002).

in 2001). In 1998, it produced 32 percent of grain, 42 percent of vegetable oil, 90 percent of cotton, 87 percent of sugar beet, 28 percent of fruit, 29.6 percent of meat, and 70 percent of grain quotas for Gansu.[50] Since most of the northwestern region has poor environmental conditions and low agricultural productivity, Hexi has become an important agricultural base for Gansu and the whole of northwestern China as well.

The region has also been making efforts to improve its industrial production. During the Mao era, while the focus of industrial development was in Lanzhou, industrial production capacities in Hexi were also improved, especially in heavy industry. Since the reforms, Hexi, like other regions of China, has emphasized economic growth and put tremendous effort into industrial development. Its secondary sector produces about 30 percent of the output in Gansu (30.2 percent in 1996 and 32.8 percent in 2001). On the whole, local resource-based industries, such as iron and steel, metallurgy, oil refining, chemicals, food, construction materials, and textiles, fare better than other industries.[51] The concentration of these in-

[50]Chuanglin Fang and Yehua Dennis Wei, "Sustainable Development Capacity and Spatial Disparities in the Hexi Region," *Dili xuebao* (Acta Geographica Sinica) 56, no. 5 (2001): 561-69. Grain quotas refer to the quantities of grains governments purchase from farmers, which are often delivered to local grain bureaus.

[51]The authors visited several successful factories in Zhangye and Wuwei cities in September 2003. One is manufacturing tomato sauce from local tomatoes, and exporting it to Western

dustries in cities, especially in the northwest of the corridor, provides those city regions with higher per capita GDPs (see map 2).

Hexi's growth, as well as that of Gansu as a whole, also faces challenges. First, having traditionally been an agriculture and raw materials base for Gansu, the region has been slow in developing non-state enterprises and the tertiary sector. It is a region characterized by a large agricultural sector, a small industrial sector, and a poor revenue base. In 1998, per capita revenue was 252 *yuan*, much lower than the provincial average (387 *yuan*). In 2001, its tertiary sector only accounted for 26.5 percent of the provincial total, although the share has been increasing over time (for example, the share was only 22 percent in 1996). Major industries are state-owned and more heavily controlled by the central government, thus are both slow to reform and have limited trickle-down effect. Gansu shares the geographical and structural characteristics of many less developed regions, such as rigorous physical conditions, low industrial efficiency, state dominance, poor entrepreneurship, and more reliance on top-down policies for local development. The region also has a lower level of urbanization compared to other northwestern regions, and some county seats have populations of only a few thousand, with weak industrial bases. While private enterprises have become the backbone of Chinese coastal economies and the new engines of economic growth, local policies emphasize agricultural production and state industries, with limited efforts to stimulate the development of private enterprises.[52]

Second, like many western areas, the Hexi region has financial difficulties and has been ineffective in attracting foreign investment. Most of the counties in the region have a budget deficit, and rely heavily on state budget transfers. They have less local capital for investment, and lack funds for industrial and urban development. Since the mid-1990s, the

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countries; a brewing materials company has a dozen major breweries as customers; a wine factory, using high-quality local grapes, has become a nationally known brand; Huangyang Town (黄羊鎮), a suburb of Wuwei on National Road 312, is becoming a processing center for flour in northwestern China.

[52]A local business owner complained to us about the rigorousness of local policies toward private enterprises and the lack of entrepreneurship among the people of Zhangye.

central government has implemented a series of opening-up policies to stimulate the flow of FDI to the interior. Foreign investment is one of the major sources of economic growth in coastal China. However, foreign capital in the interior tends to be located in selected cities near the coastal region or in provincial capitals. Hexi is known for the Silk Road and the historical heritage of Dunhuang, which has attracted some foreign visitors. However, FDI remains very limited. Many counties had zero FDI, and Zhangye City, with a population of 1.26 million, only had FDI of US$70,000 in 2001. The lack of FDI is due both to the remote location and the less favorable institutional environment for investment. Furthermore, the region has only limited investment from other provinces, some examples being investment from coastal provinces like Zhejiang in hydroelectricity, and from nearby Xingjiang and Qinghai in food-processing industries.

Third, the region has been struggling to achieve sustainable development. In the Hexi Corridor, water originates from melting glaciers and snow, springs at the foot of the Qilian Mountains, wells in the oases, and precipitation.[53] However, with limited resources and wasteful usage, water shortages and desertification have become serious problems for northwestern China. Over the years, some oases have disappeared and become deserts and wasteland, and even human settlements have had to be abandoned. In order to improve agricultural productivity, in 1990 the provincial government began to encourage more rice production in the areas along the Hei River (黑河),[54] which worsened the water shortage since rice consumes more water than most other crops. Like other provinces in northwestern China, Gansu also encouraged the reclamation of land, with the policy of "whoever cultivates can use," which also contributed to the problem of land degradation.[55] From 1978 to 1995, total and per capita

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[53]F. Fezer and R. Halfar, "Water Supply for Agriculture and Industry along the Silk Road," *GeoJournal* 20, no. 4 (1990): 409-13.

[54]Gansu Provincial Bureau of Statistics, *Gansu tongji nianjian* (Statistical yearbook of Gansu) (Beijing: Zhongguo tongji chubanshe, 1991).

[55]Those who cultivated the land did benefit from the policy, such as a farmer we visited in Wuwei who grew grapes for a local wine factory.

cultivable land in the region declined by 39.41 percent and 35.97 percent, respectively.[56] In 1998, 0.63 million *mu* (畝) of land had drought problems; 23 percent of the plains were desertified, and the grassland degradation rate was 47 percent.[57] There is also an immense demand for water in industry (e.g., the steel industry in Jiayuguan), and water is also lost to industrial pollution (e.g., the petrochemical complex in Yumen 玉門市).[58] From the 1950s to the 1990s, underground water resources were reduced by 42.4 percent.[59] Water shortage and land degradation have limited agricultural and industrial production, thereby slowing economic growth and challenging sustainability.

Hexi has been involved in many projects and policy initiatives supported by the central and provincial governments, especially efforts in recent years to improve environmental conditions. More funding has come from the central government and international organizations for infrastructure, environment, education, energy, and many other areas. For example, in 2003, it was announced that the Hexi region would receive an 830 million *yuan* loan from Japan and a matching fund of 276 million *yuan* to control sandstorms.[60] Since agricultural production consumes more than 80 percent of fresh water, the government has emphasized rational land utilization and water distribution, such as quota systems for water usage, improvement in agricultural productivity, planting grasses and trees, and water recycling. In Zhangye, it was planned that by 2003 all 100,000 *mu* of rice fields would be converted to less water-intensive

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[56]Dai Erfu and Fang Chuanglin, "Ecological Problems and Eco-environment Construction in the Hexi Corridor of Gansu Province," *Ganhanqu ziyuan yu huanjing* (Journal of Arid Land Resources and Environment) 16, no. 2 (2002): 1-5.

[57]Li Shiming et al., *Hexi zoulang shui ziyuan heli kaifa liyong yu shengtai huanjing baohu* (The Hexi Corridor: rational development and utilization of the water resources and protection of the ecological environment) (Zhengzhou: Huanghe shuili chubanshe, 2002).

[58]See note 53 above.

[59]Chen Xingpeng and Cai Genquan, *Gansu shuitu ziyuan yu shehui jingji kechixu fazhan yanjiu* (A study of water and land resources and socioeconomic sustainable development in Gansu) (Beijing: Minzu chubanshe, 2004).

[60]"Gansu Will Invest 1.1 Billion to Control Sandstorms," *Renmin ribao* (Overseas edition), June 16, 2003. The amount really allocated to the project was lately reduced.

crops.[61] More efforts have also been made to enhance water conservation by industry and urban residents, although water shortages and desertification remain serious problems in Hexi.

The Limits of Institutions: Geographical Challenges to the Western Development Strategy

China's Western Development Strategy has certainly improved the development environment and provided job opportunities in the interior. It has also turned major western cities, such as Xi'an, Chongqing, Lanzhou, and Chengdu, into booming centers of population and distribution. However, many researchers have revealed common problems facing poorer regions, especially rural areas, such as poor accessibility, low levels of education, problems in health care, and environmental degradation. The development of Hexi and Gansu as a whole reflects the problems facing all less developed regions and the persistence of regional inequality in China. The reality of western China, particularly its geographical and structural constraints, challenges the government's western development policies and sustainability.

First, many poorer regions have poor physical conditions, and are constrained by geography. While some have argued for the end of geography and the "flattening of the world,"[62] the reality in most of the developing countries, as discovered by the new economic geography, is that geography has long-lasting effects on economic development that are difficult to overcome.[63] Gallup, Gaviria, and Lora have even asked the question "Is Geography Destiny?" Wei has argued that institutions are geographically embedded, and the content and implementation of state

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[61]Zhangye Municipal Bureau of Water Affairs, comp., *Zhangyeshi jieshuixing shehui jianshe shidian ziliao huibian* (Materials on pilot site for the construction of a water-conservation society in Zhangye City) (2003).

[62]E.g., Thomas L. Friedman, *The World is Flat: A Brief History of the Twenty-first Century* (New York: Farrar, Straus and Giroux, 2005).

[63]Mellinger, Sachs, and Gallup, "Climate, Coastal Proximity, and Development."

policies have strong geographical foundations.[64] The western provinces of China are mountainous and often lack the water, sunshine, and fertile soil conditions necessary for agriculture. The remote and rugged physical conditions increase the costs for infrastructure and industrial development, and limit access to seaports and international marketplaces. Geography also affects development broadly, because it constrains access to education and institutional reform, and limits network and cluster formation, knowledge spillover, flows of productive resources, and the effective implementation of government policy. Consequently, investment efficiency in China tends to decrease further from the coast. In recent years, the government has encouraged regions to develop economies based on local competitive advantages, such as agriculture and tourism. The development of these two sectors is once again constrained by remote location and poor transportation. Geography is the primary factor limiting the development of the poorer regions in western China, a fact also acknowledged by Naughton.[65] Overcoming these constraints takes tremendous effort, and quite often they can never be totally overcome.

Second, the western region has relied heavily on the policies and support of the central and provincial governments, meaning that investment projects are less embedded in local economic geographies and more sensitive to macro-economic control. This is largely related to the geography of the western provinces, which is characterized by rigid environment and resource economies. In 1995, central government investment in fixed assets in Gansu was 9.95 billion *yuan*, larger than that from local sources (9.51 billion *yuan*).[66] In 2002, per capita local expenditure far surpassed per capita local revenue, with the deficit ratio considerably larger than that of China as a whole (see table 2). The industrial sector has lagged behind in privatization and globalization, and still has difficulty improving its competitiveness with industries in coastal China. Many local governments

[64]Wei, "Beyond the Sunan Model."
[65]Naughton, "The Western Development Program."
[66]*Gansu nianjian* (1996), 358.

in the western region have been less effective in providing policy support and services to foreign investors. Moreover, the Western Development Strategy is regionally imbalanced, and because many of the investment projects are less embedded within the local economies, they have limited spillover effects, and the weak local economies also limit the ability to embed state projects. Central government initiatives in interior China are heavily concentrated in a few key cities, especially provincial-level cities such as Lanzhou. Consequently, core cities and city regions have benefited more than the poorer peripheral regions, although their linkages to smaller cities and other regions in the interior are weak. In 2002, per capita net income of rural residents was 726 *yuan* in Gansu's Tanchang County, considerably lower than in the Chengguan District (城關區) of Lanzhou (5,553 *yuan*) and in Akesai County (4,697 *yuan*).[67] The core-periphery structure has a strong geographical base, and income gaps in many interior provinces have been rising during the reform period. More effort should be made to enhance local institutional capacity to facilitate economic development, and further improve the efficiency of state investment.

Third, the western regions are losing ground in terms of human capital and the knowledge economy. Overwhelming evidence suggests that the development of a knowledge economy relies heavily on human capital, especially well-educated, high-tech professionals who prefer open, diverse, and dynamic places. Geography is once again the basis of learning, knowledge spillover, and human capital formation. The western provinces lag behind coastal China in terms of education and human resources, and are characterized by lower educational attainment, lower literacy, fewer scientists and engineers, and lower life expectancy. Gansu not only faces the challenge of a paucity of scientists and engineers, but also the difficulty of its college graduates finding proper employment in the local job market.[68] With the competition for human capital and the drive to develop high-tech industries, western China has been losing scientists and

[67]*Gansu nianjian* (2003), 408.

[68]Chen and Cai, *Gansu shuitu ziyuan*, 220-24.

engineers to the coastal region,[69] a phenomenon known as "peacocks flying to the southeast" (孔雀東南飛, *kongque dongnan fei*). Moreover, many college graduates from western provinces who study in coastal universities have stayed on in the coastal provinces, and the western provinces have been the major source of migrant workers in the booming coastal cities. Migrant workers tend to be young, healthy, and risk-taking—exactly the kind of people the western region needs. While many provinces have offices to help people move out of the interior provinces, they have done little to encourage migrants to return to improve local economies.[70] The brain drain and competition for human resources present another challenge for the western provinces. Their remote location and poorer living conditions are further geographical constraints to human resource development.

Finally, the poorer regions also face serious challenges in sustainable development. Many western areas are facing problems of water shortage, land degradation, and endangered species.[71] Over-cultivation and land reclamation for agriculture have depleted water deposits and damaged biodiversity. Years of irresponsible agricultural and timber production have caused problems of desertification and loss of land resources, which have made the already poor physical conditions deteriorate yet further. The oases, comprising 5 percent of the land and occupied by 90 percent of the population in the region, face serious problems of continuous shrinkage and desertification.[72] The western region has also lost much land for urban and industrial development, especially the establishment of numerous development zones targeting external developers and investors. The effects of these problems reach far beyond western China, as evidenced by

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[69]He Shihong, *Zhanlue xibei* (Strategic northwest) (Lanzhou: Gansu renmin chubanshe, 2001).

[70]Sichuan, for example, is one of the major sources of migrant workers in coastal China. Our fieldwork suggests that local governments are proud of their offices to help out-migration, but we found they have done little to recruit and help returning migrants.

[71]Hong Yang, "Land Conservation Campaign in China: Integrated Management, Local Participation, and Food Supply Option," *Geoforum* 35, no. 4 (2004): 507-18.

[72]Yonghua Zhu, Yanqing Wu, and Sam Drake, "A Survey: Obstacles and Strategies for the Development of Ground-Water Resources in Arid Inland River Basins of Western China," *Journal of Arid Environments* 59, no. 2 (October 2004): 351-67.

the sandstorms in Beijing in March 2004, and water shortages and pollution in the major rivers of coastal China.

Conclusion

Much progress has been made in understanding economic transition and regional development in post-Mao China. Although an increasing amount of research into interior China has been carried out, work on intra-provincial development and inequality remains limited. More effort should be made to improve understanding of factors and agents underlying regional development in western China. In this paper we have shown that the central government of China has been active in promoting the development of its economically backward western region. However, while some progress has been made, the coastal-interior gap remains large and has been increasing over time during the reform period. In general, scholars are increasingly concerned that globalization and liberalization have challenged the capacity of the state to address the issues of poverty and regional inequality in developing countries.

A study of Gansu has revealed the patterns of uneven regional development and the challenges faced by the province. Such challenges are common to many other provinces in western China, which require substantial amounts of policy effort and investment. Joseph Cheng's study of Qinghai also identified the following areas in need of further improvement: infrastructure development; environmental protection; education, research, and technology; and people's living standards.[73] The failure in the interior to develop the township and village enterprises that have characterized the success of southern Jiangsu (known as the Sunan model) illustrates that departmental paths and success are geographically specific. The problems that the poorest regions have experienced in improving their economies

[73] Joseph Y.S. Cheng, "Qinghai's Economic Development Strategy," *Issues & Studies* 39, no. 2 (June 2003): 189-218.

and quality of life can be attributed to the constraints of geography. Moreover, foreign investment in China is geographically uneven as well, and heavily concentrated in the coastal regions. Geography is the basis for the structural characteristics of the interior provinces, and geographical constraints on the development of the interior are significant and impossible to overcome completely. The region's infrastructure can never be as developed as that of the coastal provinces.

In 2003, the central government announced that it was putting renewed emphasis on regional development to reinvigorate northeast China, which has been troubled for years by struggling SOEs. This new agenda and the continued rapid growth of coastal China have led some to wonder whether the central government is de-emphasizing the western region. In 2004, the central government confirmed its continued and ongoing support for western development, and that this would take the form of more state financial support and a more effective use of market forces. Moreover, the new *sannong* (三農, "three agricultures": rural areas, peasants, and agricultural production) policy will also have more impact on the interior which is less urbanized.

With this massive investment and support for interior development, the conditions in the interior of China, including the poorest regions, have been improved, particularly with regard to infrastructure. On the other hand, given the geographical constraints in the poorer regions, the coastal-interior divide in China is likely to continue. The present authors therefore defend the massive investment in infrastructure and ecology by the central government, which is complementary to the development of human capital, institutional reforms, and economic networks, which we recommend as well.[74] Our support for infrastructure and sustainable development is also consistent with the findings of many other scholars. Fan and Zhang, for example, found that investing more in rural infrastructure is key to increasing the overall income of the rural population, and such investment

[74]Yehua Dennis Wei, "Multiscale and Multimechanisms of Regional Inequality in China: Implications for Regional Policy," *Journal of Contemporary China* 11, no. 30 (February 2002): 109-24.

in the western region is essential to narrow its productivity gap with other regions.[75]

The coastal region of China is not problem-free, and it is in a transition period in the globalization and upgrading of its local economies. With the shift of the central government policy toward interior China, some areas of coastal China have begun to feel neglected. The poorer regions of coastal China, such as northern Guangdong, northern Jiangsu, and southwestern Zhejiang, are also geographically disadvantaged and also lag behind their neighbors in economic development. Efforts to develop those regions, however, have largely escaped the attention of the central government. Even the more developed areas, such as Wenzhou, are struggling to upgrade local manufacturing in the face of increasing global and domestic competition, as well as trying to recover from years of state neglect of their infrastructure.[76] Indeed, there are many challenging geographical issues in both coastal and interior China that merit further investigation.

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[75]Shenggen Fan and Xiaobo Zhang, "Infrastructure and Regional Economic Development in Rural China," *China Economic Review* 15, no. 2 (2004): 203-14.

[76]Ye and Wei, "Geospatial Analysis of Regional Development in China."

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