

Economy

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Township and Villages Enterprises and the Environmental Impact in Gansu, China

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1. Introduction: China's industrialization and its impact on the environment

When China's industrialization started in the 1950's, Mao Zedong and his cohorts would proudly state: "The machines are rumbling and smoke is rising from factories". Even today, smoke belches from the Chinese factories, but the industrial base that Mao once admired has undoubtedly produced an incredible environmental disaster.

Everyone would admit that China is a country whose rapid and sustained high rate of economic development has been unparalleled in recent world history. Within a decade of the Open Door – Policy, China has managed to become the world's eighth largest economy with an annual growth rate of 9.7 percent, and is ranked as one of the fastest growing economies in the world.

This is definitely something that the Chinese government and citizens should be proud of. However, this economic miracle of China is not the end of the story. It is only the positive side of the coin, which loses its magic as soon as someone starts thinking of the enormously heavy cost on the Chinese environment.

To understand the real impact of China's economic development, it is useful to take a quick look at the implementation of the most important national policies. From the First Five year plan (1953 – 1957), China started promoting the industrial economy, giving priority to the development of heavy industry and infrastructure (Bradbury, Ian et al). That was the start of economic success and environmental degradation.

From 1958 to 1960, when Mao's "Great Leap forward" took place, there was a catastrophic loss of woody biomass. Forests were cut for mining purposes to meet the high demand for charcoal the mass iron and steel melting campaign.

During the years that followed, and especially from 1966 to 1976 (the decade of the Great proletarian Cultural Revolution), people worked hard to increase national grain production. Vast tracts of forests were cleared away throughout the nation, in order to create more farms. Lakeside wetlands, which are the refuge for different species of domestic and migratory waterfowl, were used for agricultural and industrial development. Grasslands that consisted of China's largest land ecosystem were destroyed. Soil erosion and deforestation greatly diminished China's arable land (Smil, Vaclav). It is worth mentioning that during the last 4 decades; almost half of China's forests have been destroyed.

Furthermore, the intensive agricultural production of China was enhanced, making use of chemical fertilizers, pesticides and antiseptics. In recent years, China has become the second largest producer of chemical fertilizers. The use of chemicals has led to a temporary boom in agricultural production but provoked many environmental problems.

The second phase of China's rapid industrialization, which called for the implementation of open door policies, began in 1979. We must notice that the environmental crises emerging from this phase have been numerous. The main problems have been the deterioration of water quality, a big water shortage and high level of air pollution. China's lake resources have been devastated. In Central China, 815 lakes have dried up. Moreover, China's heavy reliance on fossil fuels for energy, especially coal has led to high rates of air pollution in all the major cities of the country.

2. The Negative Influence on the Environment of Township and Villages Enterprises (TVEs)

For the successful development of China based on the market oriented economy system, China's government implemented a preferential policy for the Township and Village Enterprises (TVEs). Although the first TVEs appeared in 1952, they did not come into bloom until 1978. TVEs were regarded as important to avoiding the shortcomings of over

urbanization and to encourage the development of small towns. The growth rate of TVE's output value was well over 25% during 1983-1989, it came down to 20.4% during 1989-1991 and soared up again to over 50% in 1992. The development of TVEs has made significant contributions to the rural economy and the whole national economy. Since then TVEs have entered another period of continuous rapid development. It is clear that the countryside of China holds tremendous reserve of potentials for economic development.

Needless to say, one of the main sources of the above-mentioned environmental problems is closely connected with China's Township and Village Enterprises (TVEs)¹. It is true that TVEs have played a very important role in the development of the Chinese economy and especially in the transition of the country from a command to a market economy. None can, forget however that almost all of them still rely on outdated, environmentally unfriendly production technology and equipment, inefficient use of energy, backward management techniques, and confused market information and that the wastes charge per unit of products are greater. Therefore their impact and pressure on the rural ecological environment are getting heavier and heavier.

Local governments bear immense responsibility, since they face a trade-off between protecting the environment and safeguarding the financial and employment performance of TVEs. As a result, many local governments and decision makers pay more attention to short-term economic progress, rather than to long-term ecological and social interests. In order to attract foreign investment capital, they implemented many preferential policies, with a huge cost on the environment. Through such preferential policies, many heavily polluting industries and products, which were already strictly banned in other countries, were introduced to China.

Water quality degradation has been one of the most serious rural pollution problems caused by TVEs. TVE's can be accused of using outdated, low level production technologies and equipment, inefficient use of energy, backward management techniques, and confused market information.

Small scale TVEs, such as paper mills, breweries, chemical plants and tanneries, still discharge their untreated waste into the rivers. To understand the importance of the situation, we could mention the case of the Heihe, a tributary of Huaihe River. It is estimated that the 70% of the river is comprised of wastewater. As a consequence, drinking water from major rivers is dangerously unhealthy to consume. (Bradbury, Ian and al.)

In addition, TVEs produce high levels of greenhouse gas emissions. It is estimated that 4 TVE sub sectors – brick making, coking, metal casting and cement – account for 54.2 percent of total carbon dioxide emissions.

The table that follows on the next page, provides more specific figures of the quantity of exhaust gas, waste water and waste residue produced by countryside township industries. The numbers given were gathered in 1989 (Wu huan Zhong, 1993).

¹ A study of Chinese National Environmental Protection Agency (NEPA) on pollution by TVE's, reported in the 1997 issue of the NEPA Journal of Environmental Protection, predicted that TVEs would produce 30-40 percent of all industrial liquid waste, 30 percent of sulfur dioxide emissions, 48 percent of all particulate emissions and 68 percent of all industrial particulate emissions. It is clear that TVEs have a poor record of compliance with environmental regulations.

Table 1: Types and amounts of industrial gas and waste water produced by TVEs nationwide in 1989. (Wu huan Zhong, 1993)

| Exhaust gas Waste water | Pollutants | Amount of pollutants created by TVEs industry | The percentage of pollution created by industrial TVEs |
|----------------------------|-------------------------------------|--|---|
| Exhaust gas | Total(m3) | 1.693 | 16.9 |
| | Fuel combustion | 1.312 | 18.7 |
| | Technical exhaust gas | 0.381 | 13.0 |
| | SO2 (ten thousand tons) | 359.7 | 20.5 |
| | Soot (ten thousand tons) | 543.0 | 28.0 |
| | Powder and dust (ten thousand tons) | 470.0 | 35.9 |
| | Fluorin (ten thousand tons) | 15.6 | 15.0 |
| Waste water | Total (hundred million tons) | 26.83 | 7.06 |
| | COD (ten thousand tons) | 176.9 | 18.67 |
| | Heavy metal (ton) | 1084.9 | 14.20 |
| | Cyanide (ton) | 890.3 | 20.00 |
| | Hydroxybenzene (ton) | 5735.9 | 43.00 |

Source: *The Study on Environmental-Economic Policy for China TVEs' Pollution Control*

3. The actual level of environmental pollution in Gansu Province

A researcher of the level of environmental pollution in China could never omit Gansu province and especially Lanzhou city. Since the implementation of the open – door policy, great effort has been made for the economic development of the province. Many TVEs have been established in the area, which contributed to the growth of Gansu province but at the same time provoked many environmental problems.

It is worth noting that even without any specific research, everyone can easily understand that the environment in Gansu province will soon be in danger. A visitor to the area can easily understand the seriousness of the problem just by breathing the polluted air and looking at the black smoke that fumes out of the factories and threatens the blue sky. The picture gets worse if someone turns his eyes towards the mountains that surround the area. They are without any trees or greenery.

Based on recent research, Lanzhou has been declared one of the most polluted cities in the world. The air pollution is undoubtedly very high and the water of the Yellow River does not seem at all clean. Local Chinese people declare that they have already started to understand the negative impact of economic development on the environment. Nevertheless, their actions sometimes prove the contrary. During our stay in China, we have all noticed Chinese people throwing their garbage on the ground, while our attempts to find a trash can were not always easy.

It is obvious that a lot of work must still be done for the protection of nature. A good start should definitely be a large information campaign to all the local people about the advantages of a healthy and safeguarded atmosphere.

For the impact of the Gansu province TVEs on the environment, we would say that they seem to have adopted environmentally friendly policies. The majority of the companies that we visited during our fieldwork seemed to pay much attention to the environment.

Table 2: The companies we visited during our fieldwork

| Companies -Types -Location -Forms | Various Types of Pollution | Implemented Environmental Policies | Governmental Policies | Actual Condition |
|--|---|--|--|--|
| A -Textile industry -Lanzhou -State Owned Enterprise | -air pollution -water pollution | -Collaboration with another company for the purification of the waste water | -N/A | -The air inside the factory seemed very bad |
| B -Chinese Medicine factory -Lanzhou -TVE | -water pollution | -They have their own system for the purification of water | -Local government owns the filtration plant -The cost of that plant is shared by both government and company | -We could see the water refine machine |
| Companies -Types -Location -Forms | Various Types of Pollution | Implemented Environmental Policies | Governmental Policies | Actual Condition |
| C -Milling industry -Lanzhou -TVE | -air pollution (mainly caused by the use of coal) -water pollution | -They have their own environmental protection policy -They try to be certified according ISO 14000 environmental management system standards | -Local government inspects the level of both air pollution and water pollution every month | -Bad smell, due to the absence of ventilation for chemical fumes |
| D -Milling industry -Zhangye -TVE | -air pollution -water pollution | -They purify the waste water and reuse it in their factory (They own the equipment) | -Local government representatives visit to test the pollution level (irregularly) | -Quite good |
| E -Winery -Zhangye -TVE | -water pollution | -They invest 5 million yuan for environmental protection: water purefication system, forestation | -Local government representatives visit to test twice a month | -Quite good |
| F -Paper Mill -Ningxia -TVE | -water pollution | -They have their original protection policy: water purifying system, paper recycling machine | -Local government representatives visit to test 4 times a year (irregularly) | -The drainpipes don't work -The waste water seems extremely dirty |

We interviewed in all companies and the managers of all of them reassured us that they try to implement environment friendly policies. Their main concern appeared to be wastewater, and therefore most of them have been using their own systems for water treatment management.

Based on their answers, local government has started to make a serious attempt to put an end to the violation of environmental laws. In most of the companies, the managers stated that representatives of the local government visit them at regular intervals, in order to monitor their activities and make sure that the environment is not threatened.

However, what seemed strange to all of us was that we did not receive a common answer about the penalty that the violators of the environmental laws must pay. The responses varied. Some people stated that the amount of the fine is extremely high. Some others said that Chinese companies that the laws must not just pay a penalty but they will be shut down. No one, however, provided information about the specific amount of money.

The above mentioned replies drove us to the conclusion that Chinese enterprises are not well informed about the pollution regulation. In addition, as other studies have already revealed², a number of regions implement their own rules and decide independently about the money that the violators should pay. On the whole, we note that the following cases can be found in the local government's policies. They act independently regard to:

- 1) Exempting TVEs from pollution charge
- 2) Levying penalties on negotiated basis or on the basis of personal relationship
- 3) Levying minor a little pollution charges for issuing "environmental protection pass"
- 4) Turning a blind eye to pollution

All the companies that we visited claimed that they have never been asked to pay pollution fines. However, we cannot be sure whether this reflects their excellent performance or the personal relationship they may have with local government officials.

As a conclusion, we should mention that the results of our research seem very positive for the future of the environment. All managers gave us the impression that they are fully aware of the importance of a healthy environment, and they declared that they are willing to deal with and solve the problems of present environmental degradation.

Hoping that the answers we received were accurate, we expect that the environment will be much cleaner in the days to come.

4. Conclusion

To ultimately solve the problem of environmental pollution, China must implement a strategy of sustainable development, promoting the coordinated development of economy and environment. China must harness the market – oriented economy to expedite the process of institutional reform, higher education, legislation enforcement, investment enhancement, technological innovation and policy making for wastewater management. Specifically:

- **Enforcement of environmental management institutions and legislation:** The National Environmental Protection Agency and local environmental protection bureaus should adopt stricter regulations and impose high penalties. The principle of "the polluter to pays" should be enforced and environmental pollution taxes and tradable emission permits should be introduced, along with implementation of the ISO 14000 environmental management system standards.
- **State and non-state investment:** Abatement of pollution may require considerable investment from both the commercial sector (state and non – state) and the public sector. Everyone should be sensible and contribute to the protection of the environment.
- **Education:** The government should promote education of all Chinese citizens and inform everyone about the importance of a safe environment. At the local level, the role of NGOs or private initiative should be major.

² National Environmental Protection Agency (NEPA), *The study on Environmental – Economic Policy for China TVEs' Pollution Control*, 1994

- **Establish a new way of thinking in wastewater management:** The basic strategies of TVEs wastewater prevention and treatment should be shifted to total production process control. Pollutant discharge controls should be shifted from concentration control to the combination of concentration control and total quantity. The methods of wastewater prevention and treatment should also change from a focus on separate point pollution treatment to a combination of total control and separate management.

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Strategies and Performance of Trade in Gansu Province

Wawan Juswanto

1. Background

China like other developing countries strives to increase its economic growth. To achieve high economic growth, many things should be done such as human resources development, the building of good infrastructure, and the accumulation of capital. One of strategies implemented by China to boost its economic growth, is to encourage the growth of the industrial sector. To support industrial growth, China also has changed its trading system.

Since China implemented its open door policy in the late 1970s and early 1980s, China's centrally controlled trading system has been changed into a modern market-oriented economy. In other word, China wants to create a free market and open trade to international markets. China's government strives to increase trade value both in domestic and international market.

This report attempts to analyze the trade strategies and performance of Gansu province,. It also analyzes the strategy implemented by Zhangye prefecture, one of the prefectures in Gansu province.

2. Gansu Province

2-1. Profile of Gansu Province

Gansu province is located at the upper reach of Yellow river in northwest China, with a length of 1,655 km from east to west and a width of 530 km from north to south. The total area covers 425,800 square km. It consists of 14 prefectures and cities, which include 87 counties, towns and districts with the total population 25.61 million.

2-2. Trade Strategy of Gansu Province

Following central government changes and in order to promote trading activities, Gansu provincial government strives to provide a good trading system. It has allowed foreign businessmen to cooperate with Chinese enterprises to establish:

- Commercial retail,
- Wholesale business
- Foreign trade business.

In Gansu province, there are 1800 different commodity markets including 223 wholesale markets, 55 personnel exchange centers, technological markets, 14 real estate markets including 77 county-level real estate exchange centers. There are 24 stock markets and 19 stock services departments, 2 futures markets and 15 enterprises are on the stock market in Gansu.

To encourage export growth, Gansu province is trying to enter the world market. Gansu province has established economic connection with 105 countries and regions in the world and friendly municipal relation with 16 countries and regions, such as the United State, Japan, New Zealand, and Russia.

3. Zhangye Prefecture

3-1. Profile of Zhangye Prefecture

The Economics group visited Zhangye prefecture during OFW. Zhangye is a prefecture in Gansu province. It is located in Northwest China with Wuwei, Jinchang, Jiuquan, Jiayu Pass as its next door neighbors. It is also connected to

Qin Hai province in the south and to Inner Mongolia on the North. The prefecture has Zhangye city, Shandan county, Minle county, Linze county, Gaotai county, and Yogur county under it. The prefecture covers an area of 42,000 sqkm with a population of 1.2 million people. Like other prefectures in Gansu province, it also strives to encourage economic development especially in its region. The prefecture also tries to develop a good trading system.

3-2. The Trade Strategy of Zhangye

In order to facilitate its rapid economic growth and since China is opening to the outside world, Zhangye has made great change in commercial trade. It tries to facilitate local companies to trade both in domestic and international markets.

As a part of its trading strategies, Zhangye prefecture has successfully encouraged the establishment of:

- 7 administrative departments,
- 31 enterprise managing agencies,
- 365 enterprise managing units,
- 2 transportation and storage units,
- over 170 retail networks and
- over 80 food and drink service networks.

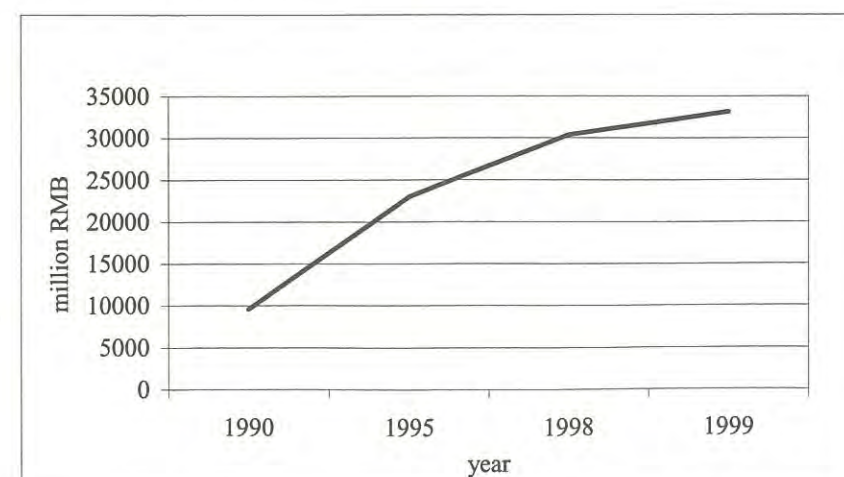
There are more than 4,700 people who are doing commercial work in the trade system of the prefecture. For instance, the foreign trade general company of Zhangye prefecture, a state owned enterprise which deals with foreign trade. It enjoys both the right to import and export goods and an independent legal position approved by China Foreign Trade and Economics Ministry.

4. The Trade Performance of Gansu Province

The domestic trade performance of Gansu Province shows great increasing in recent years. In 1990, retail sales of consumer goods, the biggest share of total trading value, of Gansu province was about 10 million RMB and has increased year by year. During 5 years (1990-1995), retail sales of consumer goods have grown more than 130 percents. In 1999, it was more than 30 million RMB and compared to 1990 it has increased more than 240 percents. This great performance is a result of trade strategies implemented by the government (see figure 1)

Figure 1 Total Value of Retail Sales of Consumer Goods

Source : Gansu Yearbook, 2000



The total value of international trade in Gansu province increased from 1.03 billion RMB in 1989 to 4.3 billion RMB in 1994. In 1995 it was only 2.1 billion RMB. In the following years, it increased to 3.9 billion RMB. Unfortunately, in 1999 it decreased again to 2.2 billion RMB. For the last ten years, Gansu has faced a trade surplus, which means that exports exceed import. In 1989, its trade surplus was 0.7 billion. In 1992 jumped to 1.6 billion. In the following years the surplus fluctuated, and in 1999 it was 1.3 billion RMB. (see Table 1)

The main export products of Gansu province are minerals, men's fashion made from cotton, cloth, and machinery. In 1998, mineral exports were US\$ 508 million, while in 1999, it was US\$ 743 million. In 1998, cloth exports were US\$ 204 million and in 1999, they were US\$ 180 million. Further more, machinery exports in 1998 were US\$ 114, while in 1999 they were only US\$ 105 million.

The main import products of Gansu province are mineral products used as raw material for industries, such as AL₂O₃ (Aluminum Oxide) and Cu (Copper). In 1998, mineral product imports were worth US\$ 3,680 million, or about 35 per cent of the total import of Gansu province. In 1999, the total import of mineral products was US\$ 1,359 million, or about 16 per cent of total import.

Table 1 Total Value of Import and Export Trade, Gansu Province (1989-1999)
(tens of thousands RMB)

| Year | Total Trade (1) | Import (2) | Export (3) | Trade Balance (4)=(3)-(2) |
|------|-----------------|------------|------------|---------------------------|
| 1989 | 103,668 | 15,713 | 87,955 | 72,242 |
| 1990 | 102,965 | 7,757 | 95,208 | 87,451 |
| 1991 | 144,052 | 12,322 | 131,730 | 119,408 |
| 1992 | 23,1656 | 35,720 | 195,936 | 160,216 |
| 1993 | 275,937 | 114,359 | 161,578 | 47,219 |
| 1994 | 431,631 | 115,336 | 316,295 | 200,959 |
| 1995 | 213,397 | 30,984 | 182,413 | 151,429 |
| 1996 | 395,553 | 169,581 | 225,972 | 56,391 |
| 1997 | 398,636 | 98,776 | 299,860 | 201,084 |
| 1998 | 378,081 | 85,564 | 292,517 | 206,953 |
| 1999 | 229,117 | 45,766 | 183,351 | 137,585 |

Source : Gansu Yearbook, 2000

5. Conclusion

In order to boost economic growth, China changed its trading system from a centrally controlled trading system into a modern market-oriented economy in the late 1970s. Gansu province strives to follow central government regulation. It built a trade distribution by encouraging the establishment of commercial retail, wholesale, and foreign trade business. Zhangye prefecture, one of prefectures in Gansu province, also has been implementing many trade strategies.

The trade value of Gansu province, especially the in domestic market, has showed significant growth. Within ten years, the value of Gansu retail sales has increased threefold. International trade showed fluctuated, but in general, there was an upward trend. The main export products were basic industries such as cloth and mining products. While the main import products were raw materials for local industries.

6. Suggestions

Since China needs a good trading system in order to balance industrial sector growth, it is better for Gansu province to provide more trade facilities. Facilities should be built not only in the urban area but also throughout the province. Since transportation conditions also play an important role in distribution, Gansu province should consider transportation system construction.

To encourage the growth of international trade, Gansu province has to encourage more the establishment of export-import trading companies. Since Gansu province has no seaport, the airport becomes a very important facility to encourage the distribution of products, and of course the roads as well.

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The Role of Local Government in Promoting Industrialization through Taxation Policies: A Case Study of Gansu Province, China

Muriyanto & Takao SEKI

1. Introduction

Gansu Province is located at the upper reach of the Yellow River, northwest China. The length is 1655 km running from east to west and the width is 530 km. The total area covers 425,800 square km. This province consists of 14 prefectures and cities, including 87 counties, towns and districts with a current total population of 25.61 million.

As one of the districts with the most potential to develop in west China, Gansu has eminent comparative advantages. The energy and mine resources are abundant and various. There are 145 kinds of valuable minerals and 2500 mining sites in this region and the potential value amount to over 800 billion yuan. The reserve of 46 kinds of minerals in Gansu ranks it in the top ten of China, especially the exploitation scale of Jinchuan copper and nickel mines, which rank second in the world. The reserve of coal amounts to 8.6 billion tons, and ranks fifteenth in China. The volume of oil deposits discovered amount to 80.6 million tons and there are 32.8 million tons remaining untouched. Gansu is located in the upper valley of the Yangtze River, passed by the Yellow River and some inner rivers and therefore has abundant water energy resources. There is a total water energy conservation amount of 14.26 million kilo watt and only 14.1 percent of the energy has been utilized.

The major industries of Gansu are petroleum, machine production, electrical power generation, electrical equipment, textile, and colored metal production. Of these major industries, the petroleum and electrical power generation are owned by the central government, in the form of State Owned Enterprises (SOE), because of their vital roles in the economy, politics, and social aspects. On the other hand, some other industries, such as machine production, electrical equipment, textiles, and metal colored production, belong to private, local government, or joint ventures between private domestic and foreign investors. Some of them are purely private, or purely owned by local government, or others are mixed ownership enterprises, while the form can be township and village enterprises (TVE) and other conventional business institutions such as firms, limited companies, individual businesses, etc. The field study focused on the roles of local government in promoting industrial development in two areas of Lanzhou city and Zhangye prefecture.

2. Field survey results

2-1. Lanzhou City

Lanzhou, the second largest city in northwest China, is the capital and center of politics, culture and the economy of Gansu Province. During the overseas fieldwork (OFW) program, the economic group visited six enterprises around Lanzhou city: a textile company, department store, pharmaceutical company, chicken farming business, casein factory, and a flower farming company. The following are the main results of interviews with each company. The first interviews took place at a large-scale textile company with a production capacity of around 18,000 to 20,000 km per day. This company employs about 3,000 workers and the salary system depends on the productivity of each worker. The local government of Gansu Province and Lanzhou City owns all shares in this company. All personnel at managerial levels are local government officials. Therefore, the local government controls every aspect of the company's management, such as the amount of production, marketing, financial matters, personnel, and other policies, including issuing local

rules for establishing and protecting the company. Based on this, the role of local government is very significant in developing this company. The second enterprise we visited is the largest department store in Lanzhou city, Lanzhou Minbai Stock Co., Ltd.. Its total sales in 2000 were 8 billion yuan. This company is a TVE with 33% of the shares belonging to the Lanzhou local government. The average profits are 14 million yuan per month and about 6% of the profit goes to the local and central government as a tax payment. The company currently employs about 2,000 workers. The general manager of this department store said that even though the local government is one of the stockholders, there is no intervention or special rules, incentives, or facilities offered by the local government in the managing of this company. In other words, it is completely privately managed. The third enterprise visited was a pharmaceutical company. The company was established in 1956 as a TVE. It is completely owned by the local government of Lanzhou city. It is a middle scale company with a total of 650 workers. The staff of the company said that the top personnel in the managerial level are local government officials and the local government also enacted some special rules for this company. These conditions give a clear indication that the local government must hold a key role in developing the company. The fourth enterprise visited was a chicken farming business. This business belongs to a local businessman. It is a family business, which employs 4 workers who are all relatives. The company breeds about 20,000 egg-producing chickens with the total amount of production of 35,000 kg of eggs per month. The chicken farm is located in a mountainous area for two main reasons: to avoid pollution and to get cheaper land rent. The businessman rents the land to the local government. The rental period is from 1988, when the business was set up, until 2001 with a rental cost of 50,000 yuan per year. The owner said that the contract of the rent cannot be transferred to another party but can be prolonged if needed. Other than giving a tax break (the products are free from tax), there is no local government intervention into the managerial matters of this business. The fifth enterprise visited was Gansu Casein Factory, founded in the 1980s on a piece of land measuring 23,333 square meters. It is a TVE of middle size with 78 workers and total assets of about 30 million yuan. This company is 100% owned by a private domestic enterprise. Its main business is the production of biological protein such as casein, sodium casein, and organism activated peptides. It receives major support in marketing from the local government of Gansu province and has cooperated technically with the China Food Industries Group Co., Ltd.. The last enterprise visited was a TVE flower farm called the Gansu Peace Peony Development Co., Ltd.. It is a special horticultural enterprise engaged in scientific research, production and the sale of ornamental plants (the area of the plantation covers 2 square km's and is on land rented from the local government). The rent is more than 2 million yuan for 50 years. The average revenue of this company is about 500 to 600 thousand yuan per year. 6% of the revenue goes the local government a tax payment. Even though the local government has a share in this company, there is no intervention from the government in managing the business. There are also no other special rules issued by the local or central government except that they a tax break for the products for the first three years after the starting of the business.

2-2. Zhangye Prefecture

During the OFW program, the economic group also visited four business institutions located in Zhangye prefecture: a starch factory, an agribusiness company, a pig farm, and a wine factory. The first company was a starch factory, which was established along local government rules in 1985 as a TVE, and then changed into a limited company in 1997. Since then, the local government has had no shares in the company. It is a middle-sized company with 670 employees with all shares belonging to its own employees. In 2001 this company paid 5 million yuan to the government in taxes, of which, 75% went to the central government and 25% went to the local government. The Second enterprise visited was a pig-farming institute. It was established in 1993 as a TVE and is located in the local government's estate of 21,000 square meters. The shares of this institution belong to the local government and the community. It is the biggest pig farm in the

region with about 30,000 pigs. The company breeds three pig species. The third visited was an agricultural model farm. It was established in 1995 and is located on a local government estate of 0.35 square km. The total value of the initial investment was 30 million yuan. The shares are 100% privately owned but it has financial support from the local government. It is the biggest agricultural area in the region. The fourth visited was a wine factory. It was established in 1994 as a private company named Binhe Group Co., Ltd. In 2000, its gross income was 1.3 billion yuan and the net profit was 21 million yuan. The total tax paid was 30 million yuan. The local government gives this company support through its advertisement policy.

3. Taxation policies

3-1. Taxation Policies of Gansu Province

As a basic rule, all enterprises in Gansu Province have a 15% tax imposed on business income until the end of the year 2010. Those companies, which would like to get a tax reduction, need the approval of the provincial tax control department or national taxation bureau. Below are the main points of the taxation policies¹.

- 1) Foreign enterprises investing in projects listed in the catalogue guide of foreign investment industries will be exempt from business income tax for the first two years. If foreign enterprises are productive enough, and get the approval of the provincial taxation department, a 3% local tax reduction will be given before 2010.
- 2) Companies and their services related to technology transfer will be free from sales tax. These are new high-tech enterprises, which come from other provinces, and research and development centers. Services include technology transfer and related technical services, technical consultation income, etc. Foreign enterprises or individual which make technology transfers at advanced levels will be exempt from sales tax and income tax. Technology transfer related to technical service and consultation income earned in Gansu by outside research institutes, universities, and colleges will be exempt from sales tax and business income tax. If a profitable enterprise spends over 10% or more annually on technological development, 50% of the real expenses will be deducted from the annual income for due taxation, with the approval of the provincial taxation department.
- 3) Private owned science and technology entities, if the production is listed in the national new high-tech product catalogue, will be exempt from import custom duties and import value-added tax when they have to import their own equipment.
- 4) Private science and technology companies in risky investments will get financial subsidies for their business income tax for five consecutive years from the government, starting from the year they begin to make a profit.
- 5) Multi-national companies, foreign investment businesses, and enterprises from other provinces can merge or purchase enterprises in Gansu. After merging, the company can take into account the loss made in the past in the assessment of income tax after the merger. If the newly merged enterprise has accepted more than 50% of the original workers, it will get subsidies for three years from Gansu Local Government for the annually increased portion of its business income tax. If the newly merged enterprise has accepted more than 30% of the original workers, the same subsidy will be given for two years.

¹ Summarised from "Investment Guide to Gansu, China", a paper presented in the OFW class by Gansu Local Government Official at GSID, Nagoya University on June 20, 2001.

- 6) Investment in construction will be relieved from land occupation tax if it is used for national and provincial highways, railways, and civil aviation airports

3-2. Taxation Policies of Zhangye Prefecture

Zhangye Prefecture Local Government gives tax incentives based on the "collect first and give back later" principle. This means the Local Government imposes taxes on the enterprise first and later on the tax is given back to the enterprise. This policy is formulated in concomitant with the state and provincial policies and also concerning the real condition of Zhangye prefecture. The main points of this local taxation policy are as follows:

- 1) Manufacturing enterprises with registered management operating for ten years or more will have to pay industrial and commercial taxes first, and then the taxes will be returned within the first two years, from the day it begins to produce. Then, 50% of the taxes will be returned to the enterprise from the third year to the fifth. From the year when the enterprise begins to profit, income tax will be returned to the enterprise in the first two years and half of it will be returned for the next three years. Enterprises which produce export commodities or develop new products will get the same treatment.
- 2) The above taxation policy also pertain to the enterprises working on basic installations for traffic, energy and communications in this region
- 3) Enterprises working in agriculture, forestry, and fruit trees in the barren hills, uncultivated slopes, sands, and water areas in the district corresponding with the policies and stipulation for the development of Zhangye prefecture are free from agricultural tax and agriculture specialty tax for five years. They begin to be taxed from the sixth year on. Enterprises in feed and fishing are free from taxes within the first two years and are taxed from the third year on.
- 4) For trade transactions related to state-owned property rights in this area, the income tax imposed upon the local financial institution will be returned in full.
- 5) The Local Taxation Department will return the personal income tax imposed on the manager of enterprises investing in this area.
- 6) The fixed assets invested in this area will be taxed at a zero tax rate when the invested scopes are conform to state policies and have been examined and approved by the local planning department and tax department (tax bureau).
- 7) The fixed assets of foreign enterprise invested in this area can enjoy increasing depreciation only if approved by the local tax department.
- 8) The investors can get a returned on enterprise income tax when they re-invest their profits in their own enterprises or the other enterprises in this area. Five years or more of registered management and the local department's approval are required to enjoy this policy.
- 9) Enterprises which engage in meat or food processing in Zhangye area are free of tax on slaughtering animals.
- 10) Enterprises, companies, and merchants both managing present local markets or stores, and involving 70% of original staff with total sales of 2,000,000 yuan per year can get 50% of the industrial and commercial tax returned within the first two years and 30% from the third year to the fifth. The income of this business might be free from income tax for the first two years and may be reduced for another three years if the local taxation department has approved the request

3-3. Tax Revenue of Gansu Province

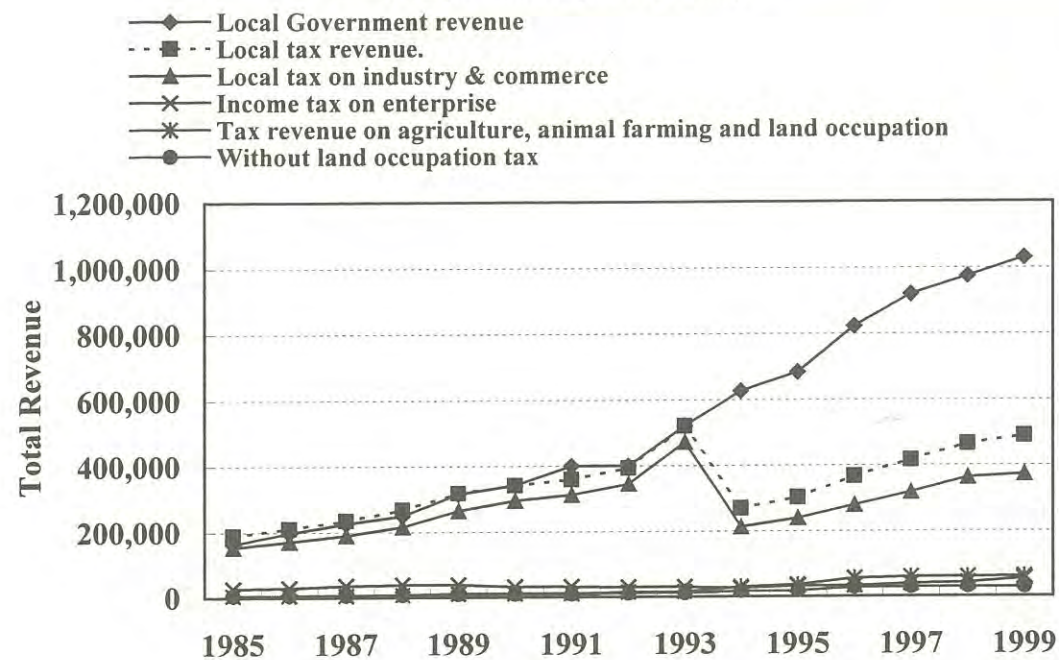
For more detailed information about the structure of Gansu Local Government revenue and its major tax resources,

see the tables and graphs below. The major source of local tax revenue comes from local taxes on industry and commerce and income tax on enterprises. The share of income tax on industry and commerce to the total local tax revenue increased faster than the income tax on enterprise and other tax sources for every year except for 1994 to 1996. During this period, both its total value and contribution to the local tax revenue decreased, but increased again from 1997 to 1999.

Table 1 : Local Government Revenue and Local Tax Revenue by Sources

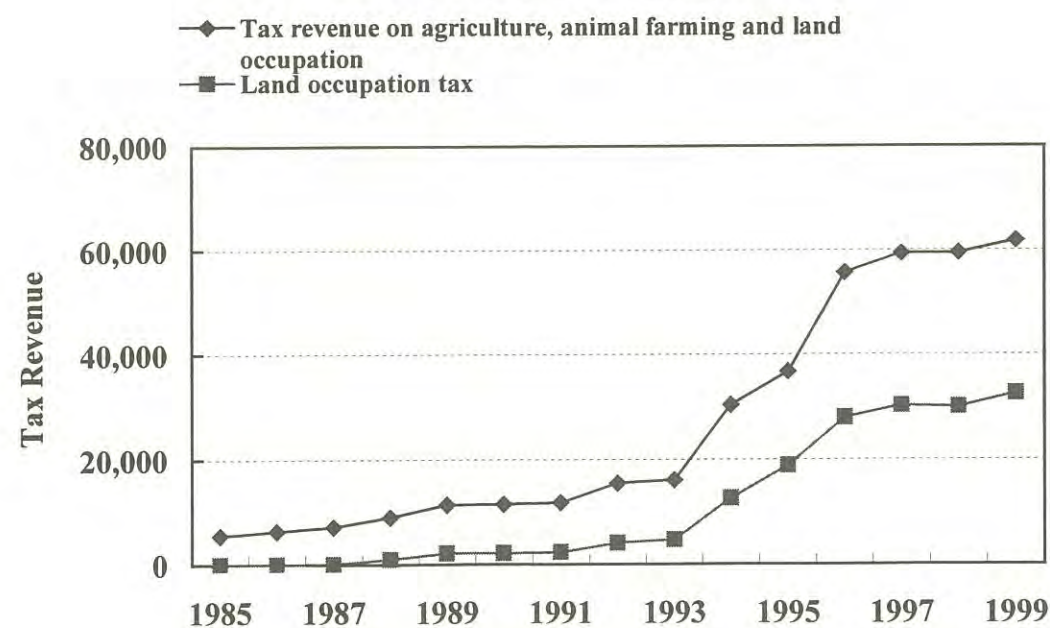
| Year | Local Government revenue | Local tax revenue | Local tax on industry & commerce | Income Tax on enterprise | Tax revenue on agriculture, animal farming and land occupation | Without land occupation tax | Land Occupation Tax |
|------|--------------------------|-------------------|----------------------------------|--------------------------|--|-----------------------------|---------------------|
| 1985 | 163,814 | 189,074 | 153,907 | 27,600 | 5,549 | 5,548 | 1 |
| 1986 | 197,635 | 210,832 | 171,986 | 30,537 | 6,314 | 6,310 | 4 |
| 1987 | 225,831 | 235,266 | 190,098 | 36,545 | 7,181 | 7,048 | 133 |
| 1988 | 249,786 | 267,766 | 216,172 | 39,967 | 9,016 | 7,986 | 1,030 |
| 1989 | 315,242 | 317,768 | 265,310 | 39,501 | 11,316 | 9,182 | 2,134 |
| 1990 | 342,065 | 341,541 | 295,300 | 33,054 | 11,459 | 9,282 | 2,177 |
| 1991 | 399,801 | 359,225 | 312,619 | 32,949 | 11,770 | 9,375 | 2,395 |
| 1992 | 399,736 | 393,208 | 345,183 | 30,903 | 15,484 | 11,394 | 4,090 |
| 1993 | 521,132 | 520,393 | 472,218 | 31,138 | 16,048 | 11,308 | 4,740 |
| 1994 | 626,198 | 270,086 | 212,682 | 27,011 | 30,393 | 17,769 | 12,624 |
| 1995 | 684,142 | 302,594 | 240,002 | 33,393 | 36,718 | 17,856 | 18,862 |
| 1996 | 822,714 | 367,663 | 279,786 | 32,494 | 55,634 | 27,663 | 27,971 |
| 1997 | 919,259 | 416,575 | 318,493 | 39,864 | 59,291 | 29,078 | 30,213 |
| 1998 | 974,793 | 465,578 | 363,635 | 42,493 | 59,450 | 29,511 | 29,939 |
| 1999 | 1,030,025 | 490,034 | 372,888 | 55,340 | 61,806 | 29,262 | 32,544 |

Graph 1
Local Government of Gansu Province's Revenue
and its major sources (10,000 Yuan)



Graph 2

The trend of tax revenue on agriculture, animal farming
and land occupation of Gansu province



In most countries and regions, the total value of local tax revenue should not exceed total local government revenue, because total local government revenue usually consists of total local tax revenue, transfers from central government, and other sources of revenue. Due to limited information and time, we could not investigate why there was such a gap between the total local tax revenue and the total local government revenue. A further study is needed to understand this.

From the above table and Graph 1, we can see that there was a big change in taxation policy both in China and in Gansu province in the middle of 1993 and 1994. Unfortunately, we could not find the exact reason for the change in government policies because of the limited time and access to information during the OFW program. But, we can guess that the substantial change might have been caused by the change in the tax proportion between central and local government during that period. From the graph we also can see that the major source of local government tax revenue comes from industrial and commercial taxes. The share of tax on entrepreneurs, agriculture, animal farming, and land occupation is still small and relatively stable. At the same time, financial support or subsidies from the central government has continuously increased and plays a very important role in the structure of local government revenue. From the table and graph 2, we can see that from 1993 there is a substantial increase of land occupation tax revenue. This rise might be caused by either an increasing tax rate or land usage for businesses. Unfortunately, due to the limited time during OFW we could not find any information on tax policies in that year. Starting from the same year 1993, the proportion of revenue from land occupation tax has been almost the same as business tax on agriculture and animal farming.

4. Conclusion

Nowadays, it seems that local government at the city or provincial level can regulate its own policies to promote industrialization in the region as long as it does not violate the laws of the central government. Taxation policies are useful for local governments. If the local government provides attractive taxation policies for all those concerned in business, such as international or domestic enterprises, investors, research institutes and so on, it will attract capital inflow, acquiring new high-tech skills to expand business by reinvesting profits. This can have a desirable outcome on the region. The benefits include not only the promotion of industrialization but also an acceleration of regional economic growth. A reduction in unemployment will be another beneficial result of these taxation policies. Taxation policies are an easy way for the local government to provide for regional economic growth. However, this could be another problematic issue in the near future. It is quite natural to think that tough competition among local governments will break out in order to attract new investment. As a result, regional disparity in Gansu province will become greater and greater due to the limited number of investors. Regional disparity is not the subject for this OFW report. But this issue would be an interesting topic as well.

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SUMMARY TABLE OF TAX POLICIES OF GANSU PROVINCE

| No. | TO WHOM | UNDER WHAT CONDITIONS | TYPE OF TAX | PERIOD | INCENTIVES | OBJECTIVES |
|-----|---|---|-------------------------------------|------------------------------------|------------------------------------|---|
| 1. | Foreign Enterprises | - Project listing in the guiding cat. - Productive | Business income tax | First 2 years Before 2010 | Free tax Reduced by 3% | Encourage FDI |
| 2. | - New high-tech Enterprises - Outside research Institute | Investors come from outside Technology transference | Sales tax Sales tax & income tax | Before 2010 Before 2010 | Free tax Free tax | Encourage new investment Encourage transfer tech. |
| 3. | - Privately owned science & tech. entity - = | Product listed in the national new high-tech. Catalogue Risky investment company | Custom duties & VAT Income tax | Before 2010 5 consecutive years | Free duty/tax Financial subsidy | Promote new high-tech prod. Encourage risky investment |
| 4. | Outside investors | - Merge/purchase enterprises in Gansu - Absorb > 50% local workers | Income tax | 3 years = | Financial subsidy = | Encourage capital inflow Reduce unemployment |
| 5. | Investors in Constructions structure | Highway, railway, civil aviation airport | Land occupation tax | Before 2010 | Free tax | Encourage provision of infra- |

= stands for the same as above.

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SUMMARY TABLE OF TAX POLICIES OF ZHANGYE PREFECTURE

| No. | TO WHOM | UNDER WHAT CONDITIONS | TYPE OF TAX | PERIOD | INCENTIVES | OBJECTIVES |
|-----|---|--|---|---|--|---|
| 1. | Manufacturing Enterprises = = = = | 10 years/longer registered management Begins to profit on Export commodities & develop new product | - Industrial tax - Commercial tax Income Tax = | First 2 years = 3 rd - 5 th year First 2 years 3 rd - 5 th year First 2 years 3 rd - 5 th year | 100% tax return = = 100% tax return 50% tax return 100% tax return 50% tax return | Promote continuity Promote continuity Promote expansion & re-investment Export promotion & improve competitive power |
| 2. | Enterprises = | Mass means of communications = | - Industrial tax - Commercial tax = | First 2 years 3 rd - 5 th year | 100% tax return 50% tax return | Promote provision of infra-structure |

| | | | | | | |
|-----|---|--|--|--|---|--|
| 3. | - Enterprises in Agri., Forestry, Fruit trees - Enterprises in feeding & fishing | Located on inconvenient area = | Agricultural tax = | 5 years First 2 years | Free tax Free tax | Promote investment in un-convenient area |
| 4. | Enterprises | Dealing with trade related to state-owned property rights | Income tax | Unlimited | 100% tax return | Promote trade of state-own property right |
| 5. | Company's Managers | Investing in Zhangye area | Income tax | Unlimited | 100% tax return | Promote investment |
| 6. | Investors | Investing in special areas determined by state policy | Fixed asset tax | Unlimited | Zero rate tax | Promote investment in special area |
| 7. | Foreign enterprises | = | = | = | Increasing depreciation | = |
| 8. | Investors | - Re-investing profits - 5-year/longer period of registered management | Income tax | Unlimited | 100% tax return | Promote investment |
| 9. | Enterprises meat food | meat or food processing | Slaughtering animal tax | Unlimited | Free tax | Promote deep processing of meat food industries |
| 10. | Entrepreneurs | - Managing the present market or store - Taking 70% of local workers - Total sales > 2 mill. Yuan/year | Industrial tax & commercial tax = Income tax | First 2 years 3 rd - 5 th year First 2 years 3 rd - 5 th year | Reduced by 50% 30% return Free tax Reduced tax | Promote continuity Reduce unemployment Promote middle up scale enterprises |

= stands for the same as above.

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The Status of Women in Chinese Enterprises: A Case Study of Companies in the Western Provinces of Gansu and Ning Xia

Manuel PILENO & Kathryn OLIVER

1. Introduction

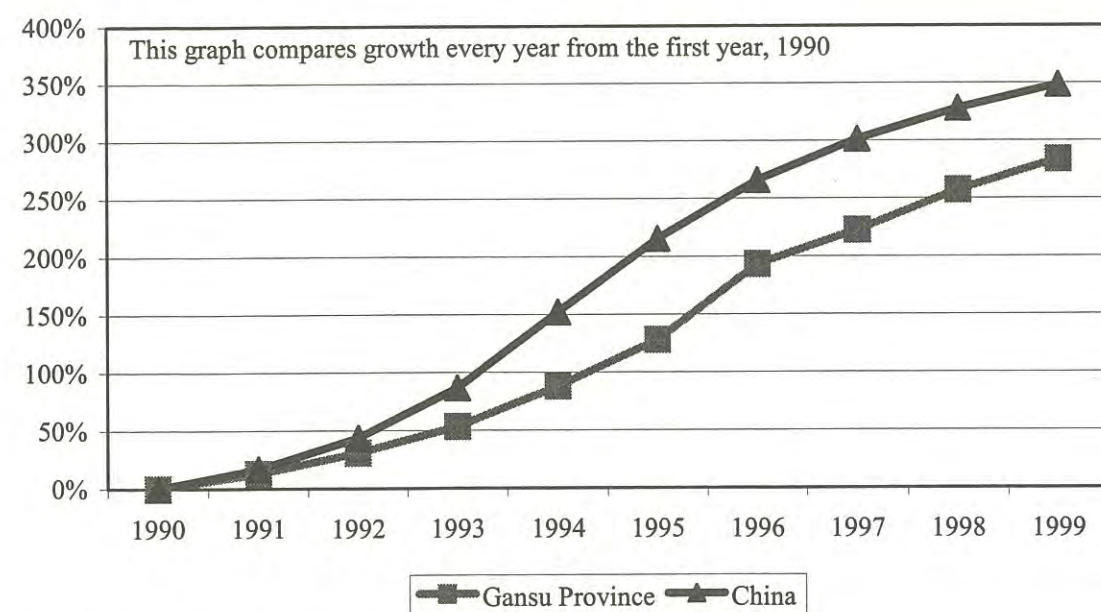
In order to gain a general overview of the status of women in Chinese enterprises from a human resources perspective, we visited several companies in two of China's Western provinces. While our research goal was to study Township and Village Enterprises (TVEs), we visited a number of non-TVE businesses of both a state-owned and privately-owned nature. Our research was primarily conducted in the cities of Lanzhou and Zhangye in the Gansu Province, but we also visited one company in the city of Zhong Wei in the neighboring province of Ning Xia.

2. Economic Background of Gansu Province

Gansu Province, located in northwest China encompasses 425,800 square kilometers of land. Its population of 25,745,000 is comprised of various ethnicities including Yuger, Tibetan, Mongolian, and Hui nationalities. Its capital, Lanzhou City, is the second largest city in northwest China and is also the geographical center of the country.

Lanzhou City, along with the fourteen other provincial cities has been undergoing significant economic growth since the PRC's implementation of economic reform policies. The province is rich with natural resources including mine ores, coal, and water. Gansu's primary industry is agriculture, but the local governments have also made considerable investments in industrial and technological development resulting in a notable increase in GDP per capita in the last decade¹.

Figure 1: Economic Growth of Gansu Province compared with China (1990 – 1999)



Sources: *Gansu Yearbook 2000*, *China Statistical Yearbook 2000*

¹ Investment in Gansu Guide

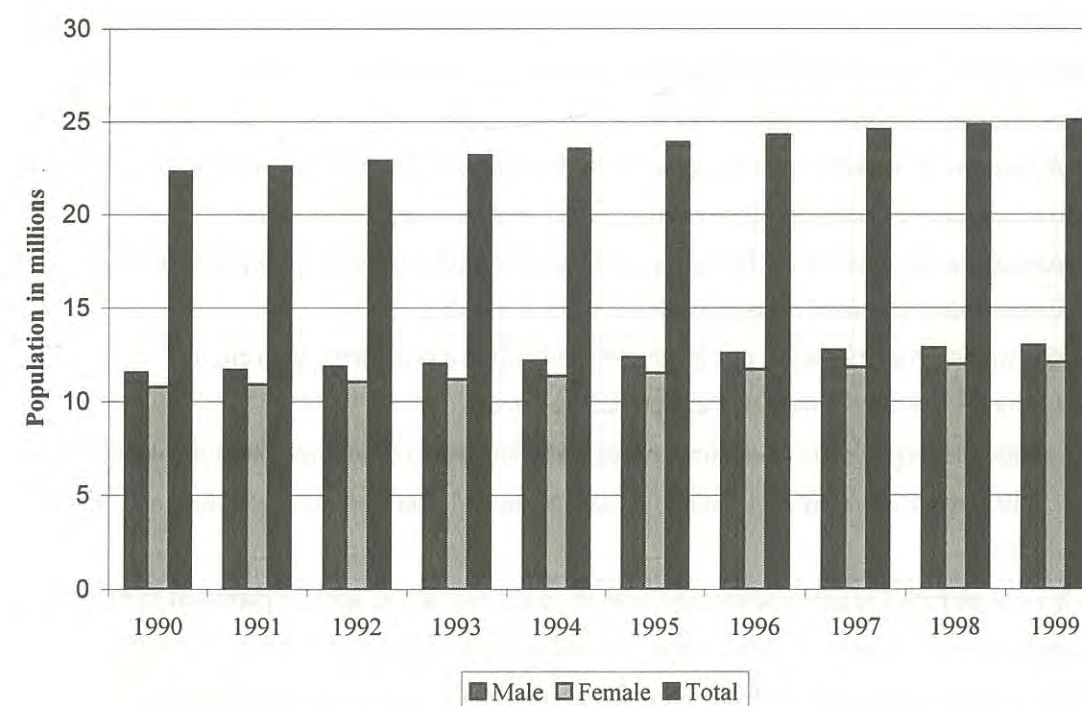
3. Women in the PRC

Women account for nearly half of the PRC's population and the country has one of the highest labor participation rates in the world. In the PRC, female participation in economic activities is 81 percent of that of men. The corresponding figures for the Republic of Korea, Malaysia, Philippines, Thailand, Japan, and the United States range from 52 percent to 77 percent².

Table 1: Male and Female Population in the Gansu Province

| Year | Male | Female | Total |
|------|------------|------------|------------|
| 1990 | 11,531,500 | 10,767,600 | 22,299,100 |
| 1991 | 11,669,800 | 10,910,300 | 22,580,100 |
| 1992 | 11,839,900 | 11,041,300 | 22,881,200 |
| 1993 | 12,001,100 | 11,184,600 | 23,185,700 |
| 1994 | 12,178,300 | 11,346,200 | 23,524,600 |
| 1995 | 12,365,300 | 11,518,500 | 23,883,800 |
| 1996 | 12,564,800 | 11,713,500 | 24,278,300 |
| 1997 | 12,731,100 | 11,835,300 | 24,566,400 |
| 1998 | 12,857,700 | 11,978,800 | 24,836,400 |
| 1999 | 12,993,000 | 12,081,500 | 25,074,500 |

Figure 2: Population Trend of Gansu Province



Source: *Gansu Yearbook 2000*

² Asian Development Bank. 1998. *Women in the People's Republic of China*. Manila: Asian Development Bank Press. p. 15.

The 1949 Communist Revolution is recognized as probably the single most important event towards improving the status of women in the PRC. "In order to emancipate women thoroughly and to realize real equality between women and men, it is necessary to have a public economy to let women participate in joint production and labor, and then women would stand in the same position as men," touted Russian revolutionary, Lenin. The Chinese Communist Party espoused these words of Lenin and the ideal that women were equal to men. While Confucianism promoted gender differences, the Communist Party aimed for gender equality. One of the founding leaders of the Chinese Communist Party, Mao Zedong, declared that women were not only entitled to "half of heaven," but were also responsible for shouldering "half the sky." Economic participation was seen as the most important vehicle for achieving emancipation for women.³

Following the economic reforms of 1978, many new job opportunities for women have been created in the rapidly growing economy. Recognizing the progress of women as an important indicator of development as well as complementary to the goals of socialism, the government has actively promoted the socioeconomic welfare of women through the establishment of non-government organizations such as the All China Women's Federation (ACWF). The objectives of the ACWF are to (i) unify and mobilize women to participate in the PRC's reforms; (ii) educate women including the training of women professionals; (iii) participate in the management and supervision of state and public affairs on behalf of women; (iv) and provide services to women and children. The ACWF operates across all levels of government. Furthermore, units and bureaus within the government, Communist Party and trade unions have been tasked to deal with women's issues. The PRC has collaborated with the various working groups for women to implement national policies aimed to improve the quality of life and promote equality between men and women. The provision of such policies prohibit (i) workplace violation of women and girls; (ii) violence and abuse of women and girls; (iii) public humiliation of women; (iv) prostitution and the abduction of women and children; and (v) selective abortions based on the sex of the fetus⁴.

One representative policy promoting women in China is the Program for the Development of the Chinese Women (1995-2000). The provisions of the policy which relate specifically to labor are as follows:

- (1) Improve the participation of women in the decision-making and management of state and social affairs.
 - Actively work to realize that the government leadership at all levels has women and the percentage of the female sex in the leadership of government departments will be greatly increased.
 - Among the members of the leadership of the sectors, departments and enterprises and firms where women workers are concentrated there should be more female leaders.
- (2) Organize women to take an active part in the open-and-reform and modernization efforts so as to promote the development of social productive forces.
 - Increase the employment of women and expand their areas of employment in the course of establishing a socialist market economy and readjusting the urban and rural industrial structure and developing tertiary industry.
 - It is not permitted to refuse to employ women on account of sex, nor is it permitted to raise the standards of employment for women, except for the jobs and positions which are unsuitable for women according to the state regulations, so as to guarantee women's right of equality with men in employment.

³ Asian Development Bank. p. 15.

⁴ Asian Development Bank. p. 47.

(3) Guarantee the labor rights of women.

-All enterprises (including foreign-funded ventures, private firms and rural industrial establishments) must conscientiously implement the PRC Labor Law and relevant regulations for the labor protection of women workers, protect women's safety and health at work, and try to improve the working conditions of women workers.

The principle of equal work for equal pay of both sexes is practiced in the city and the countryside.

-It will be the basic practice to use social funds to cover the charges for child bearing of women workers in the country⁵.

In our research we referenced the Program for the Development of the Chinese Women to gauge how conscientiously the enterprises were practicing the ideals set forth by the Chinese government and Communist Party.

4. Research Results

Table 2: Data gathered from company tours and interviews with company officials:

| Company | Total Number of Employees | Percentage of Female Employees | Percentage of Male Employees | Percentage of Female Managers | Percentage of Female Managers in Upper Management | Differences in Working Conditions and Benefits |
|---------------------------------------|---------------------------|--------------------------------|------------------------------|-------------------------------|---|--|
| Department Store | 2000 | 90% | 10% | 70% | .05% | Some |
| Chinese Herbal Medicine Factory | 650 | 60% | 40% | Present | Unknown | None |
| Pig Farm | 56 | 70% | 30% | 1.70% | 1.70% | None |
| Argo-technology Company | 210 | 20% | 80% | 0.48% | 0.48% | None |
| Peony Development Company | 60 | 50% | 50% | Unknown | Unknown | None |
| Egg Production Farm | 4 | 0% | 100% | 0% | 0% | None |
| Corn Starch and Citric Acid Company | 670 | 60% | 40% | 20% | .90% | None |
| Biological Protein Production Company | 78 | 30% | 70% | 0% | 0% | Some |
| Winery/Brewery | 1400 | 40% | 60% | 45% | 1% | None |
| Paper Mill | 400 | 37.5% | 62.5% | 30% | 0% | None |

⁵ United Nations: <http://www.un.org>. (September 19, 2001)

5. Conclusion

The accuracy of the responses received may be questionable given various limitations such as the types of people interviewed and their knowledge on specific issues; time allocated for the interviews; and the language barrier. Taking into consideration these limitations we conclude the following based on our research:

- The enterprises visited were compliant with the goals of the PRC in the number of females comprising its workforce. The egg production farm was the only enterprise which employed no females. But the business was family-run, employing a total of merely four people.
- Most unskilled labor positions were occupied by females and the managers interviewed were all male with the exception of the garment factory. While females were proportionately represented in the various enterprises visited, the total number of females in management, particularly upper management, was low compared to the number of eligible female workers. In addition, although some enterprises claimed that females filled upper management positions, a photograph of the executive team showed none.
- Female managers comprised less than one-half of the total managers in each company. The only exception was the department store, where 90% of its employees were female and the general manager interviewed claimed that 70% of its managers were female.
- In every case, the number of females in upper management was one percent or less. Even the department store where a significant portion of its workforce was female, less than one percent held an upper management position. The exception to this finding was the pig farm where the company representative asserted 1.7% of its female managers were in upper management.
- Most respondents claimed that working conditions and benefits were exactly the same for male and female employees, except in the circumstances where the physical limitations of gender (i.e. strength) was a consideration for the type of work. Some respondents added special consideration was given to females during four circumstances – menstruation, pregnancy, childbirth and breastfeeding. One respondent noted that 14 yuan per month in additional medical benefits was provided to its female employees. These practices seem aligned with Chinese national policy for women's progress.
- China is still a male-dominated society within the scope of employment. Partially, the inequity between men and women in the Chinese working environment can be attributed to the society's strong Confucian values, where doctrine dictates the subordination of women to men. Women were to be submissive and yield to the wishes of the men in the household. That people were valued differently based on gender and sexual differentiation was thought necessary for social harmony⁶.

6. Recommendation

Finally, while the companies studied seemed aligned with the Chinese national policy in addressing the special needs of women in the work environment, greater attention needed to be focused on significantly increasing women's participation in managerial roles.

⁶ Taiyi, Lin. 1998. *My country my people*. Beijing. Foreign Language Teaching and Research Press. p. 137.

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United Nations <http://www.un.org> (September 19, 2001)

**Assessment of Technology Innovation Sources of China:
The Case of Selected Enterprises in Gansu Province, People's Republic of China**

Hilda Lanao RAMOS

1. Introduction

Technology is recognized as the most significant factor in economic growth of nations and the productivity and competitiveness of firms. The Asian Development Bank in 1995 cited that technology is an important factor in production and serves as a major driving force behind industrial progress and structural change. This has been evident in the recent development experiences of most East Asian countries which have increasingly absorbed modern technology and integrated it to their productive activities.

Similarly, in today's new era of technological revolution, China continues its efforts to close the technology gap existing between it and other developed countries. Emphasis is placed on developing science and technology, and future development efforts are expected to contribute to China's continuous economic growth and advanced industrialization. China's development efforts are focused on improving the technological development of industrial enterprises, creating new competitive industries and products and improving China's infrastructure.

This paper presents the status of technology innovation and development of selected enterprises in Gansu Province, China. Due to time constraint and limited information, this paper will not be able to provide a comprehensive review of the enterprises in the province but will give a general assessment of the eight (8) selected enterprises in Gansu Province.

1-1. Objectives of the Study

Recognizing the positive correlation between technological performance and economic development, this paper attempts to assess the current status of the enterprises in terms of technological innovation sources and the development of selected enterprises in Gansu Province, People's Republic of China. Specifically, the study focuses on the following themes:

- 1) Description of Gansu Province's Technology Environment;
- 2) Assessment of Technology Innovation Sources of Selected Enterprises, and
- 3) Conclusion and Recommendations

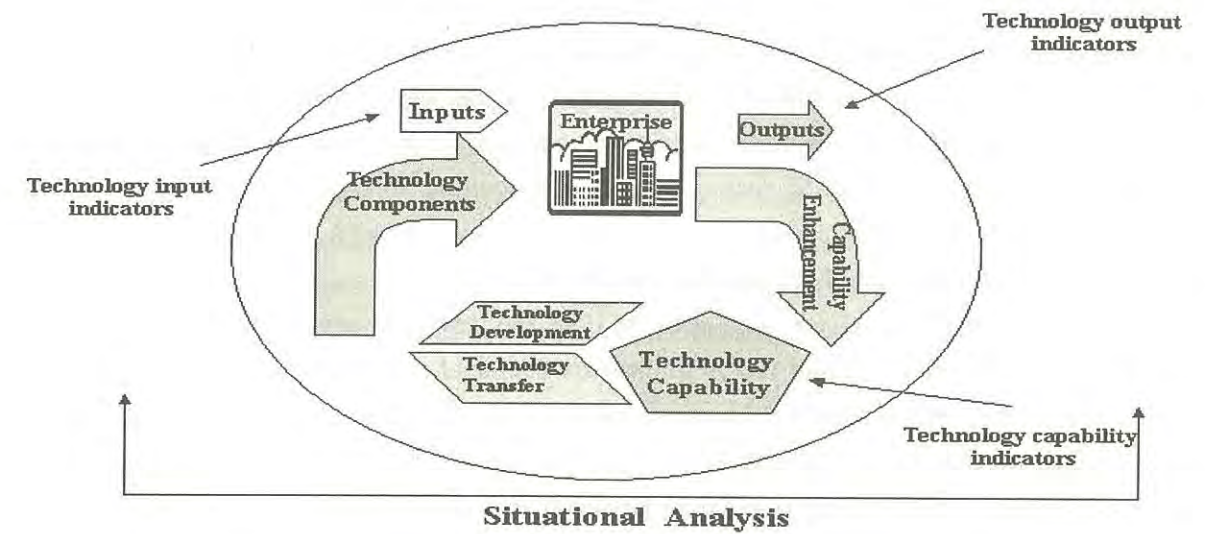
1-2. Study Framework

A number of data gathering procedures were used in this study namely, a review of relevant documents, interview, and area visits. Personal observations and interview results were the basis of analysis using the framework shown in Figure 1.

The following assessment criteria were also considered:

- a. technological learning
- b. technology sourcing (technology development, technology import, etc)

Figure 1. Study Framework



Adopted with some modifications from "Technology Transfer and Development, Implications for Developing Asia". Asian Development Bank Publication, 1995.

2. Technology Environment

During the past few years, China has created a three-tier science and technology service and development strategy (Xuan, 1995). In the first tier, most of the S&T capabilities and resources have been mobilized to serve directly the country's development, employing roughly two thirds of the country's scientific and technical resources. In the second tier, a modest amount of their S&T capabilities and resources are being employed to follow the world's high technology development trends and to develop their own. In the third tier, however, a small contingent of the most creative and innovative scientific and technological personnel is being deployed to work on the frontiers of basic research. Their research may not yield tangible results in the short term, but they hope to contribute to building scientific strength and to generate a strong impact in the long term.

Particularly in Gansu, the government has created a suitable environment that would boost science and technology development. A scientific research and technological development system suited to the development of the national economy has taken shape. In fact, a number of scientific and technological research institutes have been established in the province with a group of scientific researchers and advanced equipment.

2-1. Scientific Research Institutes and Equipment

Today, the province has 360 research and development institutes in various fields, of which 239 are natural science institutes owned by the people. Of the 239 institutes, 138 are independent institutes and 101 are dependent institutes. Among all the scientific research institutes in Gansu Province 71 are under the jurisdiction of Central Government ministries, making up 29.7 percent; and 151 belong to Gansu Province, making up 63.17 percent.

In recent years, scientific research institutes established by industrial enterprises have been developing rapidly. Large and medium-sized state-owned enterprises have founded 230 such institutes, which have become an important force in the promotion of science and technology (Investment Guide of Gansu, 1998). Moreover, research institutes established by colleges and universities have also been developing rapidly; the 55 institutes of this type are playing a positive role in higher education and economic development, including the 1,020 non-governmental science and technology institutes which have emerged in the course of China's reform. Gansu's scientific research institutes now cover 53 sectors, including agriculture, forestry, animal husbandry, fisheries and aquatic products.

2-2. Scientists, Engineers and Other Technical Personnel

According to the *Investment Guide of Gansu* in 1998 the province now has 346,400 workers with professional skills in various fields. About 16,800 of them are people of national minorities, accounting for five percent of the total number. All of them hold professional titles at different levels, with 12,200 holding senior titles, 88,300 holding medium-level titles and 210,000 holding junior titles. In Gansu the number of workers with professional skills per 10,000 people is 143.8, higher than the average level for the whole country, which is 74.7. Among all these workers 54,328 are engineering technicians, making up 15.7 percent, 13,755 are agricultural technicians, making up four percent, 44,482 are hygiene professionals, accounting for 12.8 percent, 165,679 engage in teaching, accounting for 47.8 percent, 1,934 are scientific researchers, accounting for 0.6 percent, and 66,251 engage in other fields of science and technology, accounting for 19.1 percent. 182,200 are younger than 35, making up 52 percent; 86,400 are between 36 and 45, making up 24.9 percent; 76,800 are between 46 and 60, making up 22.2 percent; and 985 are older than 61, making up 0.28 percent.

2-3. Scientific Research Achievements

Over the years, Gansu's researchers have made a great number of scientific and technological findings, and solved many complicated technical problems in production. The statistics provided by the *Investment Guide of Gansu* in 1998 indicate that during the period 1985-1995, Gansu made 5,179 scientific and technological findings, about 500 every year. During the Eighth Five-Year Plan period (1991-1995), each year 641 findings were achieved on average, up 50 percent compared with the Seventh Five-Year Plan period. Sixteen of these achievements were at the leading edge of international research, 51 at the internationally advanced level, 379 at the leading domestic level, 981 at the advanced domestic level and 403 at the advanced provincial level. Thirty-three of these findings won national natural science awards, technical invention awards or scientific and technological progress awards, 1,141 won provincial scientific and technological progress awards or "Spark Plan" awards. In order to convert technological findings into practical productive forces as soon as possible, Gansu has made great efforts in recent years to accelerate the pace of converting technological findings into commodities.

Through 40 years of development, Gansu's overall scientific and technological capacity has been greatly enhanced. Gansu's capacity for technical innovation ranks 19th in the country, and the trade volume of its technical market ranks 17th. The overall level of science and technology in the province's economy has improved. The province has realized its own advantages and developed its own unique characteristics.

2-4. Investment and Technology-Related Policies

In Gansu province, foreign businessmen can set up any industrial project permitted by the *Industrial Catalog Guiding Foreign Investment*. Foreign businessmen are particularly encouraged to invest in the

comprehensive development of agriculture, infrastructure, basic industries, social welfare service and the development of new and high-tech products as well as other new-emerging industries.

Further, foreign businessmen can also adopt a variety of methods to participate in the technical renovation of existing state-owned, collective and private enterprises within the boundaries of the province. They can participate in the transformation of a workshop or a product, in the transformation of an entire factory and the transformation of the whole trade or purchase the stock rights.

Similarly, the establishment of technology- or knowledge-intensive productive, foreign-funded enterprises are encouraged as stated in Article 4 of the set of investment regulations. Moreover, enterprise income tax is levied at a reduced rate of 15 percent, or after paying tax in accordance with state-stipulated rates, that part of tax paid at a rate higher than 15 percent will be returned to the enterprise by the financial department at the same level.

3. Results and Discussion

3-1. Assessment of Technology Innovation Sources of Selected Enterprises

3-1-1. Technology Learning

An enterprise usually obtains technological knowledge through learning by doing, on the job training, training and other formal and non-formal education programs. Particularly in Gansu, the major mode of building technological capability is through formal education and through research and development (R&D). Results of the interviews show that most of the enterprises have their own research and development facilities which employ a number of technical personnel. Most of them put more emphasis on improving their product quality through research and development.

3-1-2. Technology Sourcing

Enterprises have various sources of technology, namely; development of their own technology; technology transfer through importations and foreign direct investments (FDI), and networking in equipment and raw materials supply. Hence, technology sources include in house sources (indigenous) as well as outside sources (technology transfer) which the enterprises can utilize in their business operations.

The acquisition of new technology has served as a method to enhance technology development in China. Two out of the 8 enterprises visited in Gansu Province import their technologies from abroad. Newly acquired technologies are being adopted in production areas. Moreover, some of the enterprises make some modifications and significant innovations and come up with their own technologies.

China is not a major exporter of high technology products, i.e. its proportion of high technology products in 1998 accounted for 15 percent of manufactured exports compared with 33 percent in high income countries (Xue et. al, 2000). This is probably true because the results of the interviews show that most of the enterprises visited have developed their own production machinery and technologies (Table 2). In addition, 7 out of 8 enterprises interviewed have their own research and development facility. This shows that the enterprises put emphasis on improving their production output through research and development (R&D).

Table 2. Sources of Production Machinery, Sources of Technology and the Presence of R&D Facilities of Selected Enterprises in Gansu, Province, PRC

| Enterprise/Company | Sources of Production Machinery | Sources of Technology | Presence of R&D Facilities |
|--------------------------------------|---------------------------------|---|----------------------------|
| 1. Textile Company | Locally developed | Indigenous | Absent |
| 2. Herbal Medicine Company | Locally developed | Indigenous | Present |
| 3. Casein Factory | Locally developed and imported | Indigenous and imported | Present |
| 4. Horticulture Enterprise | Locally developed | Indigenous, imported and imported with some innovations | Present |
| 5. Starch Mill Company | Locally developed and imported | Indigenous | Present |
| 6. Hog Breeding Company | Locally developed | Indigenous | Present |
| 7. High-tech Agricultural Technology | Locally developed and imported | Imported | Present |
| 8. Wine Factory | Locally-developed and imported | Imported | Present |

Source: Personal Interview with the Managers of the Enterprises Visited in Gansu Province, PRC

4. Conclusion and Recommendations

Improvements and transfers in technology are crucial in improving the health of the rural sector. Indeed, research and development (R&D) is a major engine of growth and productivity. To ensure new and continuously improved technology, R&D needs support. Chinese agriculture for instance has enormous opportunity to grow more rapidly by using technologies developed by commercial enterprises and foreign firms. Farmers need to be given access to these technologies.

There are still signs of catching up. Most of enterprises claim that they make their own machinery and develop their own technologies, but still, production output remain low. This could be attributed to the enterprises' failure to further improve their product quality. Hence, enterprises could further improve their production if they would do more collaborative research with international research institutions and innovate through reverse engineering. In addition, they could also take advantage of the benefits of the direct foreign investments and technology importation. Along with technology acquisition, development of technology capability should also be given priority since it plays a strategic role in the attainment of comparative advantage.

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Industrial Performance and Competitive Strategies of Industrial Enterprises in Gansu, China

Nalitra THAI PRASERT

This report tries to answer several questions: How well are industrial enterprises in northwestern China performing? What are the key features of northwestern China's industrial reform process? What changes in governance and the institutional environment are most responsible for changes in enterprise conduct and performance? And what is the role of ownership in accounting for differences in conduct and performance among enterprise types?

1. Background

Industrialization started in Gansu and the Northwestern area around 1870. In the late nineteenth century and early twentieth century, the "Yan Wu" movement or "Follow the West" movement had led to the set up of modern industries, such as machinery, in these areas. This was stimulated by the policy of the Chinese government during that time to move some industry from the east to the west and inland areas. All these factors have led to industrialization in these areas, including Gansu province.

In Gansu, many kinds of industry are well developed as it is known as one of the earliest industrial bases of northwestern China and has set up a solid industrial foundation. There are five kinds of industries which are significant in the region: petrochemical, machinery and electronics, energy and power, nonferrous metal, and textiles¹. The output of nickel, platinum, cobalt, aluminum, and carbon ranks first in the country. Copper, antimony, lead, zinc, plastic ethylene, cement, synthetic rubber, plate glass, and oil drilling equipment rank first class in the country. The Copper City-Baiyin, the Nickel City-Jinchuan and the Steel City-Jiayuguan are important industrial cities in China. Some large and medium-sized state-owned enterprises such as Lanzhou Oil Refinery, Lanzhou Chemical Plant, Jinchuan Nonferrous Metal Company, Baiyin Nonferrous Metal Company, Jiuquan Steel Plant have become important pillars for the economic development of Gansu². Most of these industries are big-scale and run by central or local governments.

Table 1 shows that the gross domestic industrial product in Gansu has increased substantially over the past twenty years. The indexes of total industrial output value show that the industrial sector has experienced very high growth when compared to growth in the base year of 1978 or when compared to growth in the previous years.

Table 2 shows the gross domestic industrial product by prefecture in 1999. This table illustrates that Lanzhou city has the highest value of gross domestic industrial product in Chinese currency (Renminbi (RMB) or yuan) compared to other cities or prefectures in Gansu. Lanzhou city's industrial product value is more than three times higher than the second highest of the province, Baiyin city. However, the index of total industrial output value compared to the previous year does not show the rate of Lanzhou as the highest. Most cities and prefectures have quite similar rates of index output. Only Zhangye prefecture has a lower rate of industrial

¹ From a lecture at Lanzhou University by the vice president of Lanzhou University.

² The Foreign Affairs Office of Gansu Provincial People's Government. 1999. *Gansu: Marching to the New Century*,

output index compared to its previous year. For the percentage of gross domestic industrial output to GDP, they are very high in Jiayuguan city, Jinchang, city, Baiyin city, and Linxia Hui autonomous prefecture. These four cities and prefectures have higher proportion of industrial output than Lanzhou city.

Table 1: Gross Domestic Industrial Product in Gansu

| Year | GDP (hundred million yuan) | Gross Domestic Industrial Product (hundred million yuan) | Proportion of Industrial Product to GDP (%) | Index of Total Industrial Output Value (1978=100) | Index of Total Industrial Output Value (previous year=100) |
|------|----------------------------------|--|--|--|--|
| 1980 | 73.90 | 35.25 | 47.70 | 111.96 | 105.18 |
| 1985 | 123.39 | 50.54 | 40.96 | 162.05 | 118.07 |
| 1990 | 242.80 | 83.93 | 34.57 | 253.47 | 107.52 |
| 1995 | 553.35 | 226.45 | 40.92 | 466.59 | 114.00 |
| 1999 | 931.98 | 327.68 | 35.16 | 679.14 | 110.38 |

Source: *Gansu Yearbook 2000*. Lanzhou: China Statistics Press.

Table 2 Gansu's Gross Domestic Industrial Product by Prefecture in 1999

| Prefecture | Value (hundred million yuan) | Index of Total Industrial Output Value (1998=100) | Percentage of Gross Domestic Industrial Output to GDP (%) |
|---|---------------------------------|---|---|
| Lanzhou City | 108.00 | 107.0 | 39.24 |
| Jiayuguan City | 11.71 | 109.8 | 69.45 |
| Jinchang City | 18.41 | 104.8 | 58.84 |
| Baiyin City | 30.35 | 105.4 | 42.24 |
| Tiansui City | 25.11 | 105.9 | 34.11 |
| Jiuquan Prefecture | 20.41 | 108.0 | 30.82 |
| Zhangye Prefecture | 12.71 | 99.3 | 21.54 |
| Wuwei Prefecture | 12.52 | 119.5 | 21.29 |
| Dinxi Prefecture | 7.16 | 110.7 | 18.02 |
| Longnan Prefecture | 8.03 | 107.1 | 21.13 |
| Pingliang Prefecture | 12.03 | 108.6 | 20.73 |
| Qingyang Prefecture | 19.99 | 109.1 | 37.87 |
| Linxia Hui Autonomous Prefecture | 12.12 | 113.3 | 41.92 |
| Gannan Tibetan Autonomous Prefecture | 2.15 | 113.2 | 16.94 |

Source: *Gansu Yearbook 2000*. Lanzhou: China Statistics Press.

2. Current Situation of Industrial Development in Gansu Province

2-1 Regional Perspective

Recently, Gansu has greatly promoted industrialization in the region in order to become more self-reliant in industrial supplies, to reduce dependency on other regions, and to increase per capita income in the region. However, many industries and products from Gansu still cannot compete well in out-region markets, especially in those of highly developed Eastern China, or in the international markets, due to higher cost of transportation.

Infrastructure, such as railways and highways in Gansu is the bottleneck of development in this region, as it is still far behind national average standards. During the OFW research in Gansu province, it was very noticeable that the road conditions between cities and towns had not yet met with the local or international standards and many routes were still underconstruction.

Moreover, many industries in Gansu are still trapped in poor management problems due to its low ratio of non-public sector and high ratio of publicly-owned enterprises. Table 3 shows gross domestic industrial product by types of ownership and their shared percentages in 1999. It is evident that most industrial output in Gansu is from the publicly-owned enterprises, especially the state-owned enterprises which comprise more than 60 percent of total industrial output in Gansu. The non-publicly-owned enterprises share only 14.68 percent in total industrial output. This implies that publicly-owned enterprises still dominate the industrial sector in Gansu province. It is widely believed that non-private ownership usually leads to poor management, poor marketing skills, inefficiency, and poor growth potential. Most of the large- and medium-sized state owned enterprises are now losing their competitiveness due to their old-fashioned management styles and failure to invest in new technology. For instance, the vice-president of Lanzhou University stated that one big petrochemical enterprise in Lanzhou city, which employs around 10,000 employees, is currently operating at only one-fourth of its production capacity. This severe under-capacity situation leads to long-term profit loss and the enterprise's dependency on government subsidies, such as on salary payment. This kind of poor management not only slows down the industrial development in the region, but also leads to other social problems such as unemployment and a lower per capita income.

Table 3 Gansu's Gross Domestic Industrial Product by Ownership and the Shared Percentage in 1999

| Type of Ownership | Value (hundred million yuan) | Percentage |
|---|---------------------------------|------------|
| Gross Domestic Industrial Output | 327.68 | 100.00 |
| Publicly-owned Enterprise | 279.59 | 85.32 |
| State-owned Enterprise | 203.00 | 61.95 |
| Collective-owned Enterprise | 76.59 | 23.37 |
| Others | 0.00 | 0.00 |
| Non-publicly-owned Enterprise | 48.09 | 14.68 |
| Privately-owned Enterprise | 6.57 | 2.01 |
| Individually-owned Enterprise | 18.04 | 5.50 |
| Others | 23.48 | 7.17 |

Source: *Gansu Yearbook 2000*. Lanzhou: China Statistics Press.

Another reason why this region cannot attract as many investors and investments as the eastern or southern regions can is due to its inferior environmental situation and climate. Its arid to semi-arid land, its dry weather, its high mountainous areas without forests areas, and its great distance from the coast have prevented fast-growing development in this region. Therefore, though the central government has tried to promote investment in the northwestern region of China through a *building greater northwest* policy, few companies have invested or are willing to invest in this region. For instance, during the first and second five-year economic plan, 156 big- and medium-sized projects were established in China. Only six projects invested in Gansu³.

³ From a lecture at Lanzhou University by the vice president of Lanzhou University.

All the reasons above have led to under-developed industrialization in Gansu and the northwestern areas, which leads to lower standard of living and lower income for people in this region. Gansu has 86 counties, 49 of them are rated as poor counties by central and local governments' standard. Its trade proportions within China and with foreign countries are very low⁴. Therefore, in order to deal with these problems, more jobs must be created through sustainable industrial development. The agricultural sector, infrastructure, and environmental situation should also be improved. A strategy for industrial development in this region is to focus on developing unique, high quality products which can compete in domestic and world markets. Moreover, central and local governments should develop sound policies and stipulations in order to attract further investment. Privatization and new industry development are also major challenges to both industries themselves and the local government.

2-2 Resources from Field Research

Table 4 shows six categories of industrial enterprises examined during the OFW research in Gansu Province. It illustrates types of industry, types of ownership, their markets, their business performance, and their business strategies to compete in the markets. Two of them are publicly-owned, the rest have private ownership.

From this field research of industrial enterprises in Gansu, it is noticeable that all of the enterprises interviewed have performed well. Some of the privately-owned or joint-stock enterprises were previously state-owned or town-owned enterprises and went through the process of privatization. From interviews with resource personnel, we learned that these enterprises experienced poor performance and encountered several years of profit loss during the years of public ownership. After being privatized, all of them became more efficient and maintained straight years of profit-making. As for the two state-owned and township enterprises, their performance is also good. Though, publicly-owned enterprises, they only receive some assistance from the local government in terms of policy suggestions and market information.

In all of the enterprises where interview took place, people showed concern about their business potential and competitiveness in the markets. Most of their strategies, therefore, focus on quality and uniqueness of their products. Most of their markets are in domestic China, mostly in Gansu province and northwestern region. Products which have the potential to compete in eastern China or international markets mostly have local uniqueness, high quality, or use local advantages, such as the Gansu Casein factory which produces their protein products from mountain goat's milk (yak milk), which is difficult to find in other provinces.

⁴ From a lecture at Lanzhou University by the vice president of Lanzhou University.

Table 4 Field Research Enterprises in Gansu, their Performance, and their Strategies

| Company name | Location | Type of industry | Type of ownership | Market | Performance | Strategy |
|---|--------------------------------|--|--|--|--|---|
| Lanzhou Textile Co., Ltd. | Lanzhou City | Textile | State-owned Enterprise | 90% domestic China 10% export to South East Asia | Making profits, but facing major competition from Southern China due to its high transportation cost | Finding long-term customers (ex. Uniform), finding new markets both directly and through local government |
| Ya-ou Shang Sha Department Store (Lanzhou Minbai Stock Co., Ltd.) | Lanzhou City | Department Store | Privately-owned enterprise | 100% in Gansu | A major seller of import products in the region, making net profit of 40 million yuan/year | Maintaining itself as the biggest department store in the province, improving its systems and image through study tours to major department stores in other regions and countries |
| Lanzhou Pharmaceutical Co., Ltd. | Lanzhou City | Pharmaceutical (Chinese medicines) | Township Enterprise | 80% domestic China 20% export to USA, Australia, Singapore, Japan | Middle level producer, making net profit of 17 million yuan/year, facing many competitors and production control problems | Developing its own unique kinds of medicines |
| Gansu Casein Factory | Lanzhou City | Biological Protein Production (from Yak milk) | Private, joint-stock enterprise (stocks also owned by employees; no government shares) | 70% domestic China 30% export to England, Germany, Spain, Turkey, Africa | Made net profit of 4.5 million yuan in 2000 | Maintaining high product quality (non-chemical product), finding new markets both directly and through local government |
| Gansu Linze Xuejing Starch Chemical Co., Ltd. | Linze County, Zhangye District | Corn Starch Mill, Citric Acid, Corn protein flour, etc | Private, joint-stock enterprise (stocks also owned by employees; no government shares) | Domestic China and export to USA, Japan, Europe | One of the largest producers in five Northwestern provinces, continuing to increase the production, making net profit of 890,000 yuan in 2000 (from 1992-1997 was SOE and faced profit losses) | Improving quality of products especially that of corn starch (natural content) and citric acid, using trademark and patent |
| Gansu Guofeng Wine Co., Ltd. (The Binhe Group) | Zhangye District | Wine factory | Privately-owned enterprise | Main market is in five Northwestern provinces, also Beijing, Shanghai, Sechuan, Hong Kong, Taiwan, etc | Making net profit of 21 million yuan | Using brand names and advertising (20 million yuan for advertising per year) |

Source: Field Research Interviews

3. Suggested Strategies

As explained in the previous sections, Gansu has a strong industrial foundation due to its natural endowments and comparative advantages on some inputs. However, it also has many disadvantages due to its inferior environmental situation, its low ratio of privately-owned enterprises, and its under-developed infrastructures. Therefore, in order to compete in the current highly competitive markets of both domestic China and the world, industrial enterprises in Gansu need to improve their business strategies, together with the increasing role and support from the governments for better opportunities and potentials in the markets.

One of the strategies for industrial development in this region is to focus on improving product quality and creating product uniqueness in order to compete in domestic and world markets. Moreover, central and local governments must create sound policies and stipulations to aid further investment. Privatization and new industry development are also major challenges to both industries themselves and the local government.

3-1 Improving products' quality and creating products' uniqueness

Although China has continued its great economic performance for decades and its domestic market is very large, which gives promising opportunities to both existing investors and newcomers, the conditions in the northwestern region and Gansu province is not as impressive as the overall Chinese standard. Industries and enterprises in the northwestern region are facing many barriers and challenges due to various inferior environmental conditions, such as having arid to semi-arid land and dry weather, as explained before. Therefore, in order to compete in the highly competitive markets, they should focus or shift their strategies to improve product quality and product uniqueness. Since this region has advantages of lower cost input, such as lower wages and lower prices of agricultural products, the price level of industrial input is also lower than most other regions in the country. It is believed that if the enterprises can cut costs but increase the quality of products, it will surely be able to compete better in the markets. The uniqueness of a product can also help to increase the enterprise's competitiveness since the product can still enter the market because the supply of the same feature and quality of that product is limited. Also, because recently consumers have come to care more about quality and sometimes about a unique style.

It is noticeable that this strategy has already been applied by some enterprises in this region as can be seen in table 4. All enterprises which have applied the strategy have performed well. Therefore, the strategy is proven to be effective and should be further encouraged.

3-2 Implementing sound government policies and stipulations for further investment in the region

Industrial reforms, in northwestern China and in China as a whole, have been partial and piecemeal. As a result, key institutions, including bankruptcy laws, the banking system, and the social insurance system, remain undeveloped. This is one of the most important obstacles to trade and business.

Therefore, the government's policies should be adjusted to improve the investment environment, to encourage and attract businessmen at home and abroad to invest and initiate industry and commerce, and to speed up the development of the economy of northwestern China and Gansu. The policies should offer more attractive investment conditions and benefits than those of other fast-growing regions, as Gansu and the northwestern region are still less attractive due to their inferior environmental conditions. Investors will invest only if they see increasing investment opportunities in this region through well-developed and friendly investment policies, higher benefits from lower tax rates and lower input costs, and trustworthy laws and helpful government officers. Therefore, the policies and stipulations should be applied to, for example, taxes, ownership

law, investment law, and so on. However, despite the need to attract more investors, environmental control regulations should not be lenient, or it could create further serious environmental problems.

3-3 Stimulating the process of privatization

It is widely accepted that most publicly-owned enterprises often have poor management, poor marketing skills, and poor growth potential. This is because they are publicly-owned; therefore, they usually receive some subsidies or support from the government and even the weak ones are sometimes not allowed to fail. This can lead to further macroeconomic troubles or financial crisis. It may be better if structural transformation is shifted towards a more market-oriented sector, with improved management incentives and autonomy. Moreover, rising competition from the massive entry of firms and easier access to other markets reduce profit margins for firms, especially publicly-owned ones, who used to enjoy high pitfalls from local government support and less competitors during the years that the Chinese government tried to promote industrialization in each local area. It is shown in table 3 that Gansu still has a very high rate of publicly-owned enterprises, which is one of the barriers to increasing the province's output and overall competitiveness. Although the productivity in Gansu's industry, principally in state industry, is growing, profitability in state industry is declining, and the number of enterprises with losses is on the rise. Therefore, governments should encourage more privatization in order to create better motivated, independent managers and hard-working employees.

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A Review of Agricultural Development in Gansu Province, China

Trinh Tuong VAN

1. Introduction

China is the world's largest agricultural economy and a producer of a most variety of crops. This is likely due to the country's diverse geography and climate. This feature can be seen more clearly if one looks at Gansu Province, since it possesses the same complex agricultural situation as the rest of China.

Gansu Province is located in northwestern China with the length 1,655 km from the east to the west and a width of 530 km from the north to the south, with the total area covering 425,800 square km¹. With its vast land, different climates (e.g. subtropical zone, warm temperate zone and middle-temperate zone), Gansu is capable of developing special agriculture with various products, among which raw materials of beer, traditional medicine, vegetables, fruits are the main ones. However, the dry weather in this area also creates difficulties for developing agricultural productivity. This may be one of the reasons explaining why the agricultural contribution to the total regional GDP of Gansu remains around only 20% from the 1970s until the 1990s².

Although Gansu Province is still considered a poor area in China, it can be said that the central government and local government have made great efforts to achieve regional economic development, such as investment in construction, industry, and agriculture. One of the goals is to fulfill the province's ambition of becoming self-sufficient in grain by developing agriculture. This paper will examine the case of Gansu Province's agriculture to see its current situation and to understand how agriculture can also help some other economic sectors develop. The paper consists of the followings parts: (1) Agricultural development in Gansu Province: a case of Zhangye Prefecture and review of agriculture-related industry; (2) Some current strategies from Gansu local government in agricultural development; (3) Conclusion and proposals on agricultural development strategy in Gansu.

2. Agriculture in Gansu Province

2-1. Overview

Owing to its vast land, Gansu has various agricultural products, such as grain, cotton, oil crops, and fruit. The total output value of agriculture in 1999 was equal to 19,121 million RMB, in which farming contributes the most (nearly 74 percent of the total agricultural output). Gansu's agriculture has obtained a high growth rate in 1990s especially compared to the 1970s and the 1980s (Figure 1), showing stable and dramatic development in agriculture³. The answer to the question of how Gansu's agriculture has achieved such remarkable improvement after the 1980s can be found if one looks back to the reform policy in China in 1978, of which a household-responsible system of production is the key factor to improved agricultural productivity.

Agricultural proportion in regional gross domestic product (RGDP) is less than that of the industrial sector

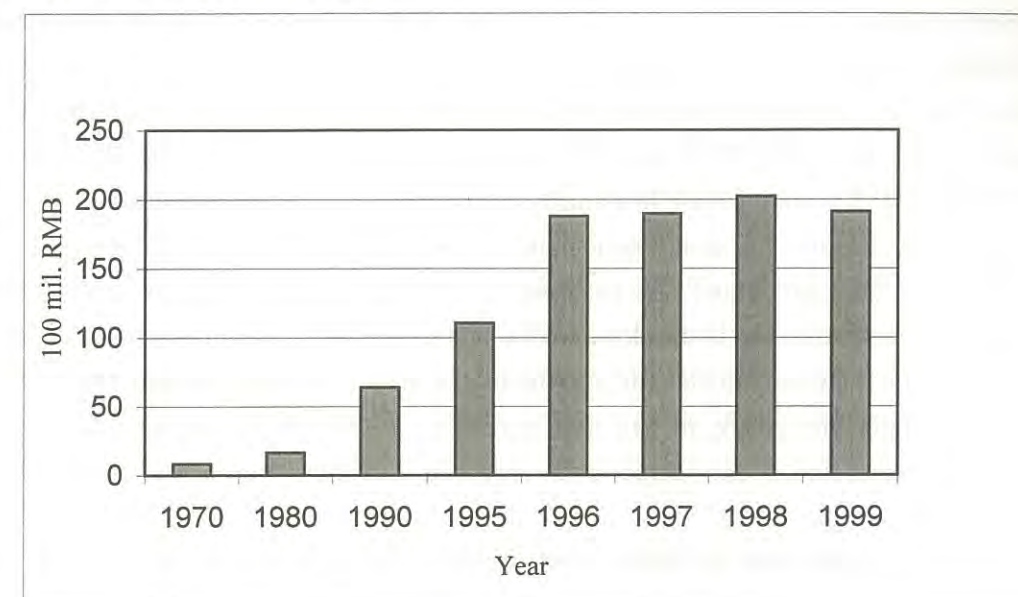
¹ Investment Guide in Gansu. 2000.

² The statistics used in this paper are drawn from *Gansu Yearbook 2000*, China Statistics Press.

³ The drastic improvement in agricultural output in this area during 1990s, like other parts of China, mainly resulted from China's agricultural reforms in the 1980s, with the so-called "household responsibility system". The household responsibility system is a transformation from the collective and centrally-planned economic system into individual system in which economic decision making devolves on households.

in Gansu. In 1999, for example, while the share of the industrial sector in RGDP was about 45 percent, agricultural shares accounted for only 20 percent.

Figure 1: Total Output of Agriculture in Gansu



Source: *Gansu Yearbook 2000*, China Statistics Press.

The output value of Gansu's agriculture mainly comes from farming. The second major agricultural product is animal husbandry, the third is forestry and the last is the fishery. Table 1 shows the structure of Gansu's agriculture in selected years of the 1990s, indicating that the most important section is crop farming.

Table 1: Increased value of crop farming, animal husbandry, forestry, and fishing (10,000RMB)

| | 1995 | 1998 | 1999 | % each section of total | |
|------------------|-----------|-----------|-----------|-------------------------|--------|
| | | | | 1998 | 1999 |
| Total | 1,487,299 | 2,022,148 | 1,912,059 | 100.00 | 100.00 |
| Crops farming | 1,078,164 | 1,472,555 | 1,413,100 | 72.8 | 73.9 |
| Animal husbandry | 366,745 | 495,047 | 441,545 | 24.5 | 23.1 |
| Forestry | 36,077 | 44,796 | 48,390 | 2.2 | 2.5 |
| Fishery | 6,313 | 9,841 | 9,024 | 0.5 | 0.5 |

Source: *Gansu Yearbook 2000*, China Statistics Press.

Last but not least, the natural condition in Gansu, as mentioned above, is a main factor which makes the differences in RGDP from one prefecture to another. Some areas, such as Longnan Prefecture, Pingliang Prefecture, Linxia Hui Nationality Autonomous Prefecture and Gannan Zang Nationality Autonomous Prefecture, are less developed in agriculture, while the areas of Zhangye Prefecture and Wuwei Prefecture have more favourable conditions for developing the agricultural sector. These two prefectures, as a result, contribute the most to the RGDP of Gansu. In the next section, a case study of Zhangye Prefecture will be presented, since the prefecture has been considered as an exemplar for Gansu's agricultural development strategy.

2-2. Agriculture in Zhangye Prefecture

Zhangye Prefecture lies in the middle part of the Hexi Corridor, covering a total area of 41,900 square kilometers, with a population of 1.2 million people. Zhangye is rich in various natural resources, with good irrigation, fertile soil, sufficient water and sunshine. Agricultural products of this prefecture are wheat, corn, rice, oil crops, many kinds of fruits and vegetables, of which Wujiang rice of Zhangye, apple-pear and purple garlic of Minle, and red jujube of Linze enjoy good reputations and are well received in the domestic and world market. Besides, it is also a famous commercial base area of cows, sheep, pigs, fish, etc. In this area, the current net income per capita has reached 1,651 RMB annually, and the gross output value of agriculture of Zhangye in 1999 reached 377 billion RMB, ranking it the first among all prefectures and cities in Gansu.

One of the priority strategies for steady agricultural development in Zhangye Prefecture is to focus on investment in high technology agriculture. For example, in 1995 the local government encouraged the first-established private company in this area to develop a new model for agriculture by giving financial support. With the new technology, productivity can double or triple with higher quality products compared to the conventional methods with the same input. Nowadays, the new high technology is used for developing a demonstration zone in agriculture in Shigangdun and is considered as an exemplar for improving agricultural productivity and quality in this prefecture.

Animal husbandry is regarded as the second most important part of agriculture in this area. Although its share of the Zhangye's total agricultural output was only around 15 percent in 1999, its output value of almost 391 million RMB in the same year ranked it first in Gansu province.

Besides agriculture, it is necessary to mention that township and non-state-owned enterprises in this area are rapidly developing. These enterprises nowadays play a key role in Zhangye Prefecture, boosted by local government. There has been a group of 10 important well-developed industries in Zhangye, among which are agriculture-related enterprises, including beverage, food processing, corn starch, granulated sugar, etc, of which the products' quality is rewarded by the state and ministries. Among the successful enterprises is Binhe Group Company of Gansu. The company is known for its beverage products such as spirits and wines, which come from the vineyards in Gansu. It is said that since the special climate in Zhangye and some nearby areas is rather similar to that of Bordeaux in France, this area is especially suitable for planting grapes to produce fine wines. In other words, this example shows that the natural features in Zhangye create favourable conditions for enterprises to be set up and develop in its rural areas.

Zhangye is successful in agricultural production. According to *Gansu Yearbook 2000*, the total output value of agriculture accounts for 24 percent of the prefecture's total gross product of 1999, lower than other areas such as Wuwei Prefecture, Dingxi Prefecture, or Longnan Prefecture, of which the rate is around 38 to 46 percent in the same year, but ranking Zhangye first in agricultural production, with a value of nearly 38 billion RMB (Longnan Prefecture, for example, produced about 25 billion RMB in 1999).

2-3. Agriculture-related industry in Gansu Province

As mentioned above, agricultural development has influenced the rural enterprises. Studies show that the rural enterprises in China, in consequence, create markets for agricultural output, more jobs for rural areas, and sources of information and techniques for improving the quality of products and productivity in the coming harvests. In Gansu, although it is said that such enterprises have lagged somewhat behind other areas in China, the total output value of rural enterprises in Gansu in 1999 reached 62 billion RMB, almost triple that of

agriculture. However, in this province, the output value of enterprises in the agricultural area is still low (only about 686 million RMB in 1999). Even though the statistics indicate that the output of enterprises in the agricultural area of Zhangye Prefecture is at the highest value in Gansu, the respective proportion is nearly 3 percent – very low compared to the contribution of industrial and service sectors.

One exemplar of agriculture-related enterprises in the province named here is the case of Binhe Group Company of Gansu, which is located in Zhangye City. This is one of 12 large enterprise groups designated by the People's Government of Gansu Province and the only modern food industrial group empowered with both import and export rights in Gansu Province. A backbone subsidiary company of the group, the Gansu Binhe Liquor Mill, is one of the large, second-category state-owned enterprises and China's only producer of liquor in three different series. It occupies the largest share of the market in Gansu Province. The group has total assets of 386 million RMB, and consists of two Sino-foreign joint-ventures, and fourteen economic entities. It initially built a large multiple-operation enterprise group combining scientific research, industrial and agricultural production and trade, embracing hi-tech and high value added projects such as food processing, packing, animal husbandry, ceramics, agricultural and side-line products, etc. Its products are sold to more than twenty provinces, municipalities, autonomous regions and countries and regions in Southeast Asia. It also maintains business contacts with investors from the United States, Japan, Russia and Hong Kong, showing its vitality in expanding its trade scale and introducing new projects⁴.

The above case shows the close relationship between agriculture and rural enterprises in rural areas of China. First, various agricultural products can result in establishing enterprises whose purpose is to deal with processing agricultural products. These enterprises can be attributed directly to the agricultural improvements of the 1980s. Second, burgeoning enterprises probably bring about greater demand for agricultural production, creating important motivation for people working in this area.

3. Strategies of the Gansu local government for agricultural development

Briefly, following the Chinese government's economic development, Gansu province's strategy now focuses on social and economic development as the main target. In this province, a new materials production base, a comprehensive high-tech petroleum chemical base, a traditional Chinese medicine-processing base, and a forestry and husbandry producing base will be established. The increasing rate of GDP will amount to 8 percent annually. On the basis of preserving and increasing grain production capacity and securing the balance of grain supply and demand, special agriculture and bill-ordering production will be encouraged to develop. The base of forestry, fruit, and husbandry will be built as well as a group of leading enterprises to be established and supported to deal with the processing of agricultural products and trading. A number of industries will be strengthened, combining commerce, technology and agriculture.

With its strategy and strong commitment to economic development, Gansu will grasp the western China's development opportunities while the country's joining WTO will speed up the reforms in the whole country.

4. Conclusion

In the area of agriculture in Gansu, it can be said that the province has a great potential for stable agricultural development. Gansu possesses a rich supply of various natural resources and its production has been

⁴ Investment Guide in Gansu. 2000.

maintained at a high growth rate since 1990s. Although there is inequality in agricultural production between prefectures, it cannot be denied that the agriculture in this area has developed dramatically and will continue growing with appropriate strategies from local government. For example, the local government encourages and gives priority to research for new high-technology agriculture and planning to spread technology throughout the province. This policy has been introduced in Gansu and can be seen clearly through the example of Zhangye Prefecture.

However, agriculture-related enterprises in Gansu's agriculture need more attention and investment. The rural enterprises, which are very successful in almost all areas of China, should be focused in this province to boost agriculture and the rural economy. Farmers will have more incentives to increase productivity if the enterprises' demand of raw materials continues growing. In this way, both sides – agriculture and enterprise- can get more benefit and develop with higher efficiency.

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