Key State-Owned Forest Areas in Northeast of China: Reform Paths and Policy Implications

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Introduction

China's state-owned forest sector has been through and still facing with great challenges for a long period. Since 1986, the State Council and Forestry Administrations of China have provided solutions specifically and repeatedly for the issues of state-owned forestry enterprises. In order to mitigate the severity of forest resource crisis and economic crisis, both managers and employees have vigorously attempted for a series of institutional changes in forest resource management, silviculture, management diversification, and forest products processing. Valuable experiences are accumulated. Since the Natural Forest Protection Project, which was implemented in 1998, the Chinese government has changed its forestry policy to give pivot support to main state forest areas, instead of more exploitation than investment. Hence, the long-standing contradiction in this sector has been eased. What's more important, it provides great opportunity for state forest areas to explore new institutional and mechanism reforms, and to achieve sustainable development.

Peking University, with support of the State Forest Administration and provincial administrations, have conducted a follow-up survey during the period of June-August of 2009, based on the survey in key state forest areas in northeast of China in the year of 2005. According to quantitative analysis, state-owned forest areas have shown new vitalities in both resource management and economic growth, while effectively reduced the formal implementation costs of reforms. This indicates the time for deepening the reform of state forest area is coming.

This report is structured in four sections. Section 1 reviews the status quo of natural resource management and economic growth. In section 2, the reforming steps and practices in state-owned forests are presented, followed by still-existing problems in section 3. Finally, section 4 concludes and provides some policy implications.

1 Status Quo of Resource Management and Economic Growth in State-Owned Forest Areas

1.1 FOREST RESOURCES

It has been customary to consider the resource problems in key state forest areas in northeast of China as a summary of, resource crisis. Specifically, they are in terms of the decrease in the abundance of forest resources, and the general decline of quality. However in recent years, it has been improved in both quantity and quality senses, according to our survey results.[1]

1.1.1 Growth in forest area and stock

[1] Our data on forest resources is based on the second category of forest inventory from all levels of forest administrations in state-owned forest areas.

In key state-owned forests in northeast of China, forest resources have shown upward trends in terms of forestland area and timber stock, while growth rate varies across regions. Figure 1 and 2 shows that, at bureau level, the average forestland area and timber stock is higher in Inner Mongolia than the other two provinces, and has taken on a positive growth since 1989. This is due to its state-owned forest enterprises being relatively larger in scale. Jilin province, has the smallest area of forestland among the three, but its average timber stock per bureau is much higher (around 30%) than in Heilongjiang through all the period. Since 1990 this trend starts to grow steadily, and the growth rate speeds up after 1998. In Heilongjiang, forest resources have declined since the 1980s, with its timber stock in 2002 dropping to 13.97 million m^3, the lowest point. It begins to increase afterwards, reaching 17.13 million m^3 by 2008. This information implies that, the NFPP has indeed provides state-owned forest areas opportunity to recuperate, otherwise changes in forest resources would tend to differentiate instead.

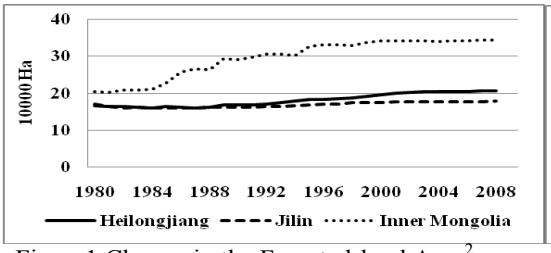

Figure1 Change in the Forested-land Area[2]

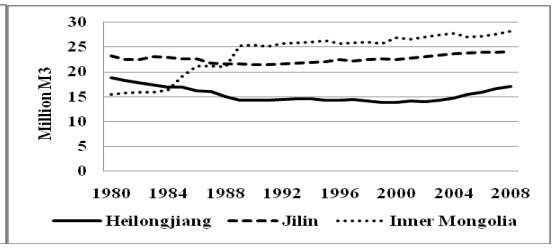

Figure2 Change in the Forested-land Volume

1.1.2 Improved forest quality

The average timber stock per unit has increased in all three provinces since 2000 (see Figure 3). Jilin has the highest forest quality among the three, with the average stably at the level of 130 m^3/ha, ranging from the lowest of 127 m^3/ha in 2000 to 134 m^3/ha in 2008. In Inner Mongolia, timber stock per unit on bureau average has been steadily around 80 m^3/ha throughout the period. The forty bureaus in Heilongjiang has great variation in timber stocks. It reduces from 108 to 67 m^3/ha from 1980 to 2002, and then tends to increase afterwards, with 81 m^3/ha by 2008, reaching the level of Inner Mongolia. It can be inferred that, in all three provinces the quality of forest resources has shown an upward trend since the implantation of the NFPP. This improvement is in favor of resolving the crisis facing state-owned forest resources. However, due to the small extent of improvement, it still has a long way to go.

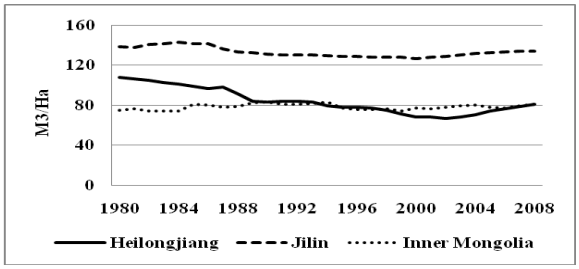

Figure 3 Change in Volume Per Hectare of the Forested-land

[2] The data used in all figures are survey data and express the average level of state forest bureau if there wasn't particular annotation.

1.1.3 Rationalized resource structure

Changes in stand structure of forestland are in favor of the protection of forest resources. With implementation of the NFPP, a major adjustment has been made on the share of forestland for timber production (see Figure 4). The forestland area of timber production decreases from 92.62% to 33.44% during 1997-2008, while that of protection forests area increases from 5.27% to 56.07% over the same period. This adjustment results to a significant decrease in timber harvest of state-owned forest enterprises who had hardly forest to cut, and thus forest resources are effectively preserved.

Additionally, the forestland share of total land area for forestry use has increased (see Figure 5). Meanwhile, area shares of open forest, shrub land, afforestation for undeveloped forests, nursery land, and non-stocked land, have declined. This outcome can be attributed to persistent afforestation over years. For example, the share of forestland increases from 78.79% in 1980 to 89.99% in 2008.

The growth of forestland share in total land for forestry use, in association with the growth of protection forest share in timber production forests, have demonstrated timber production is no longer a main premise for state-owned forests. The shift to sustain forest resources, has not only rationalized the structure of forest resources, but provided favorable conditions to resolve the 'forest resource crisis'.

Figure4 Change in the Structure of Forest Land Area

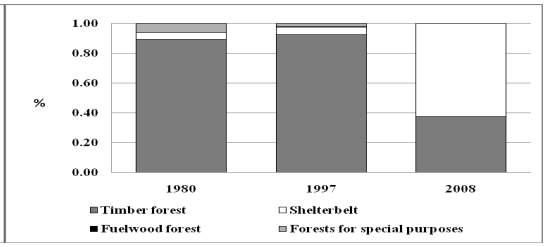

Figure5 Change in the Structure of Forest Stands Area

1.1.4 Further reduction in scale of timber production

The average timber output has reduced greatly in state-owned forests. In Figure 6, the average felling amount in Inner Mongolia has dropped over a half, from 0.57 to 0.22 million m^3 in 1980-2008. In Heilongjiang, the average timber output declines to 0.14 million m^3 in 2008 from 0.44 million in 1980. Jilin, which is always the lowest in timber output among the three, has also declined, from 0.37 to 0.14 million m^3 during the same period.

Decline in harvest is for many reasons, among which the most important ones are, a significant reduction in harvestable resources, adjusted structure of forest species, and control on logging bans. This decline has also resulted to a large fell of state-owned forest enterprises in timber supply. Therefore, state-owned forest areas are now facing the challenges on how to resolve forest resources crisis, and on to contribute to the overall forestry development in China.

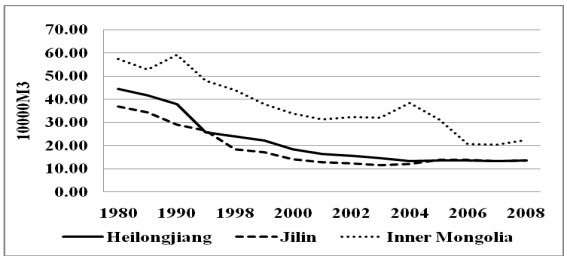

Figure 6 Change in Timber Production

To evaluate whether the slight improvement in forest resources can drive the economic development in state-owned forest areas, we investigate and analyze the status quo of their economic conditions and the consequences in the rest of this section.

1.2 STATUS QUO OF STATE-OWNED FOREST AREAS

1.2.1 Stable development of forest administrations

(1) Remarkable achievements of economic restructuring

Through many years of reform in restructuring industrial pattern, reorganizing processing industry, and developing diversified businesses, forest administrations in state forest areas have tremendously changed output shares of various industries out of the total region. Figure 7 shows the growth rate of the output share of the primary industry, from less than 10% in 1980 to over 50% in 2008, and its faster growth after that. Figure 8 shows the output share change of the secondary industry, with a decline from over 80% in 1980 to below 40%. Figure 9 shows the output share change of the tertiary industry, which has increased from less than 10% in 1980 to 20% in 2008. Figure 7 also indicates that, today's industrial structure is the outcome of a long-term growth, while after the NFPP implanted in late 90s this trend of industrial adjustment has been accelerated.

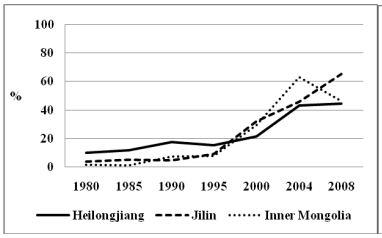

Figure7 Change in Percentage of the Production Value for the Primary Industry in Total Production Value of Society

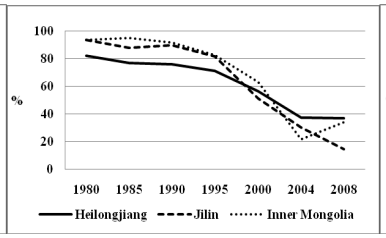

Figure8 Change in Percentage of the Production Value for the Secondary Industry in Total Production Value of Society

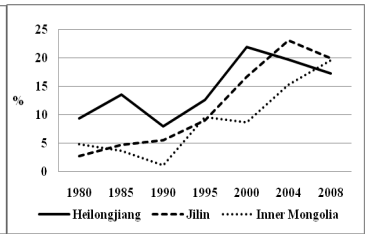

Figure9 Change in Percentage of the Production Value for the Tertiary Industry in Total Production Value of Society

(2) Heavy social burden

Since late 90s, the structural change in forest communities' social burden has altered significantly. Figure 10 shows great success in reorienting redundant employees after 1998. In all three provinces, the average number of workers on the job has dropped down by a large degree, i.e., basically half the number of 1998 by the

year 2008. Thus, the proportion of forest workers over the total population of forest communities has declined from over 30% to around 20% (see Figure 11).

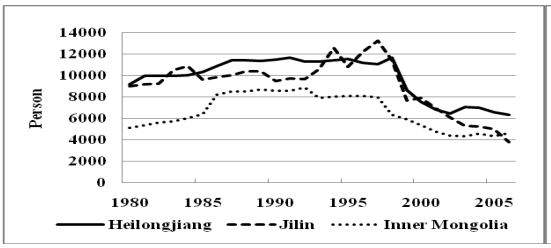

Figure10 Change of "On the Position" Workers

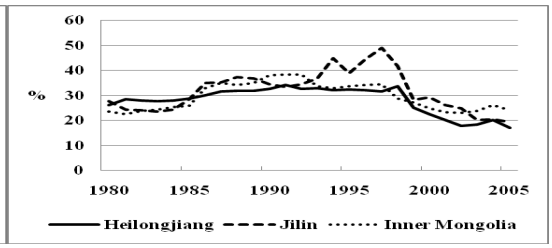

Figure11 Change of the Percentage of "On-the-position" Workers in the Population

Compared to the decline in the number of fully employed workers, the number of workers employed by social service, paid by public expenditure of forest enterprises, has changed slightly (see Figure 12, and 14). This implies, in spite of weakened function of offering jobs on forest enterprises, the ratio of the major social service sector has maintained a growth trend due to the difficulty in weakening their service function. Moreover, retired workers are more than 70% of employees on the post, with it over 100% in Jilin (see Figure 16, and 17). Thus, during the process of the NFPP, aging and social security needs are highlighted.

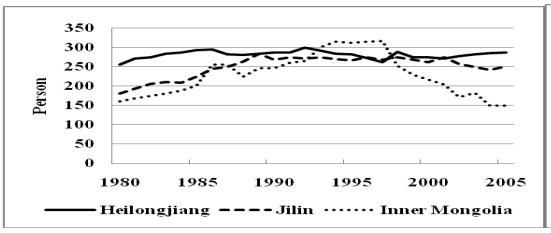

Figure 12 Change in the Number of Hospital Staff

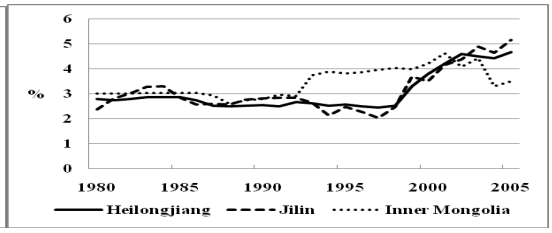

Figure 13 Change in the Percentage of the Number of Hospital Staff in the Number of "On-the-position" Workers

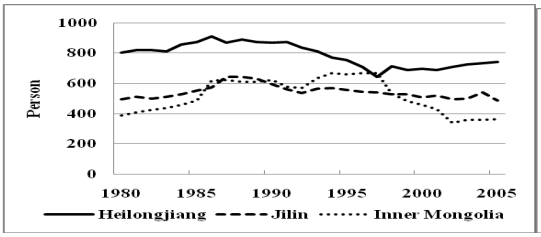

Figure 14 Change in the Number of School Staff

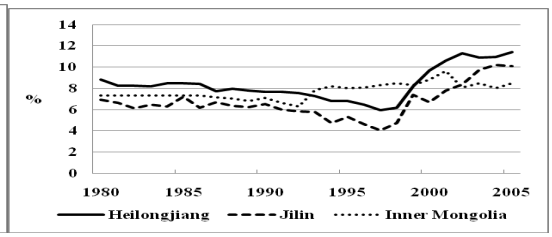

Figure 15 Change in the Percentage of the Number of School Staff in the Number of "On-the-position" Workers

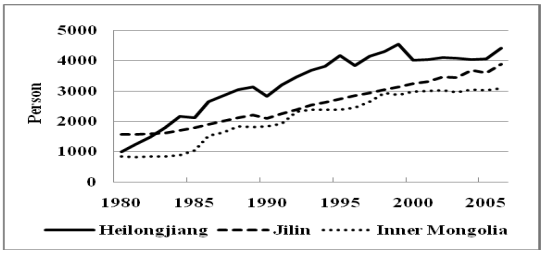

Figure 16 Change in the Number of Retirees

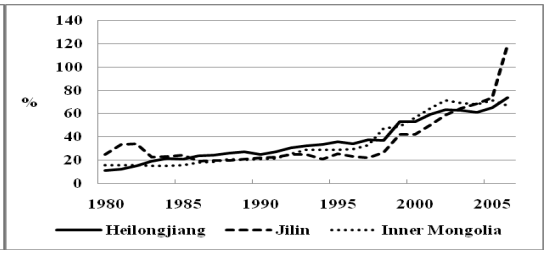

Figure 17 Change in the Percentage of the Number of Retirees in the Number of "On-the-position" Workers

1.2.2 Improved living standards of forest enterprises employees

(1) Remarkable income increase

Since 1997, household income per capita in state-owned forest enterprises has continued to increase by far (see Figure 18-21). Table 1 shows the annual growth rate during 1997-2008 above the average level of China. Seeing from the income level, household total income per capita in forest enterprises is far below the level of urban residents, with merely 44% of them by 2008; and comparing it with rural income per capita of China, it is lower in 1997, and only 12% higher above it by year 2008. This result suggests that, although employees of state-owned enterprises are holding urban registered residences, their actual living standard is nothing different as rural residents in suburban areas, in stark contrast to sitting with the abundance of forest resources.

The annual growth rate of household income per capita is increasing in all three provinces, among which Jilin is the highest, followed by Inner Mongolia and Heilongjiang, respectively. This situation is consistent with each province's forest resources quality, indicating to a certain extent of the workers' high dependence on forest resources. Speaking of the overall annual growth rate, it has increased all over the country after the year 2004. During this period it is higher in state-owned forest enterprises, above the average annual growth rate of urban income per capita. However, because of its lower base, in northeast China it is merely 44% of the overall urban household income per capita of China. Jilin, the highest in income level and growth rate, is only 85% of the total urban household income per capita of Jilin, indicating an income gap still exists.

Table1 Comparing Table in Per Capita Income

Unit：Yuan，%

	Item	1997	2004	2008	Average increasing rate in 1997-2004	Average increasing rate in 2004-2008	Average increasing rate in 1997-2008
Total	Per capita income of forest bureau household	2304.47	4065.87	7567.669	8.45	16.80	11.42
	Per capita income of urban households	5682.39	10795.17	17067.78	9.60	12.13	10.52
	Per capita income of rural households	3397.53	4393.65	6700.69	3.74	11.13	6.37
	Per capita pure income of rural households	2367.72	3193.76	4760.62	4.37	10.49	6.56
Heilongjiang	Per capita income of forest bureau household	1955.01	3753.21	6678.42	9.77	15.50	11.82
	Per capita income of urban households	4724.66	8956.61	12264.06	9.57	8.17	9.06
	Per capita pure income of rural households	2653.45	3449.29	4855.59	3.82	8.93	5.65
Jilin	Per capita income of forest bureau household	3004.03	4544.41	11668.62	6.09	26.59	13.13
	Per capita income of urban households	4853.11	9326.05	13606.03	9.78	9.90	9.82
	Per capita pure income of rural households	2522.63	3400.43	4932.74	4.36	9.75	6.29
Inner Mongolia	Per capita income of forest bureau household	2662.30	4683.16	9521.93	8.40	19.41	12.28
	Per capita income of urban households	4852.61	9754.04	15195.44	10.49	11.72	10.93
	Per capita pure income of rural households	2177.01	2995.08	4656.18	4.66	11.66	7.16

Data Source：Per capita income of forest bureau from survey data. Per capita income of urban households, per capita income of rural households and per capita pure income of rural households from ZGTJNJ (various years)
Note1: Income is adjusted to 2008 RMB using national and regional CPI (ZGTJNJ, various years).
Note2: Income increasing rate is geometric average.

Dividing worker households according to their locations of residence into upper and lower mountain areas for the sake of comparison, one can infer that the two trends of their growth have gone through a gradual convergence of alternating process. Workers from lower mountain areas earned more than upper ones in 1997, before the implementation of the NFPP. Then in 2004, upper ones surpassed those from lower mountain areas in household income per capita. By the year 2008 these two trends converge.

In the context of institutional and environmental changes in state-owned forest areas, the following inferences can be assumed on income changes between these two types of workers: In 1997 before the NFPP, workers' income was dominated by the internal division system in state-owned forest enterprises. Workers living at lower levels of mountain areas were mainly employees of governmental agencies and processing companies, whose income were thus higher than those living at upper levels of mountain areas and engaging in planting trees and harvesting. Since the implementation of the NFPP, a large number of workers were seniority buyouts, in associated with the disintegration and ownership transformation of many economic organizations.

Workers' income sources are as a result diversified. In the beginning, workers from upper levels had closer access to forestland and natural forest resources. After a series of reforms in household contract system, their major sources of income were thus from a variety of non-wood forest products, agriculture, and animal husbandry, with a rapid growth and exceeding the households who lived in lower mountain areas. However, the potential of managing land is limited in growth. Further development of private businesses and market economy both inside and outside forest communities has extended job and income opportunities. Therefore, household income level of workers living at lower mountain areas speeded up in growth. It is quite normal that the income gap between two types of workers due to geographical conditions gradually disappeared.

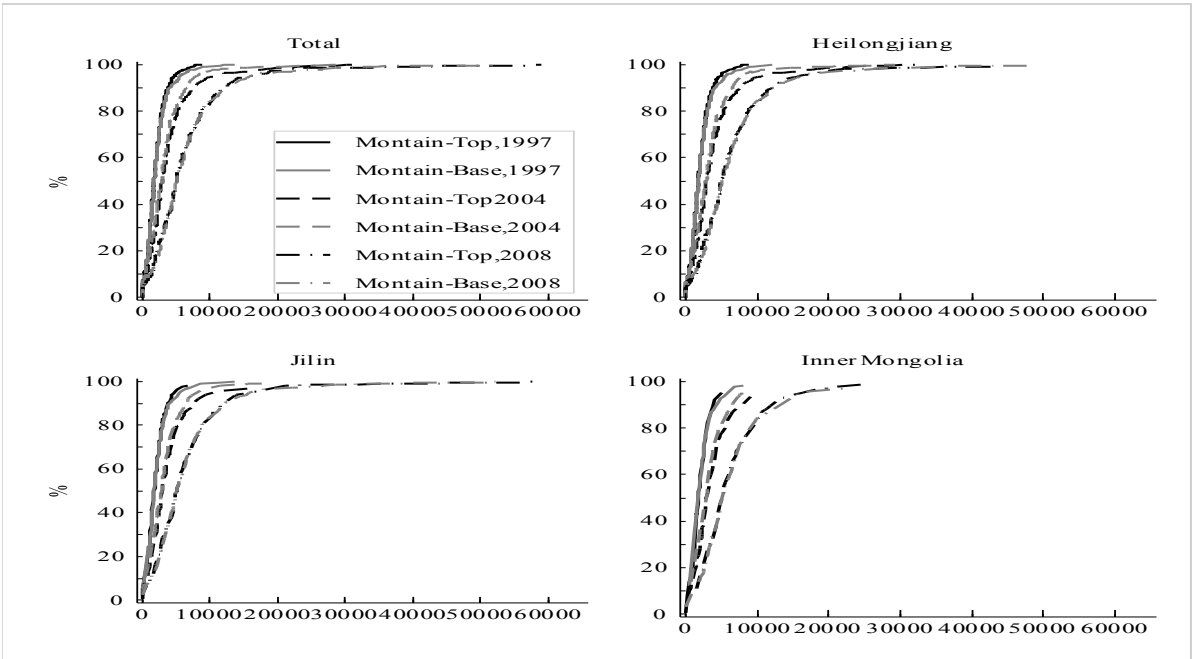

Figure18 Empirical Distribution of Per Capita Income, 1997, 2004&2008 (in2008RMB)

(2) Significant change in income structure

Figure 22-24 show the overall income structures in all three provinces, where employees' major income sources are still from wage or pension, with the proportion of agricultural income increased remarkably. Wage income accounts for 74.13% of the total household income per capita in 1997, dropping to 59.90% in 2004, and further to 58.60% in 2008, while it is still above half of their total income. Pension share is rising year by year, from 22.23% in 1997 to 25.84% in 2004, and then 27.66% in 2008, accounting for over one fourth of a worker's total income.

Speaking of other income sources, agricultural share has increased a lot and become worker's major source of income, from merely 1.14% of the total income per capita in 1997 to 3.56% in 2004 and then 11.39% in 2008. Figure 23 shows that, for workers from lower mountain areas, wage or pension is a single-source of their income, accounting for over 90% of their total income. In Figure 24, of the income sources for workers from upper mountain areas, agricultural income is the third main source of their income in addition to wage or pension. This can be highly attributed to their closer access to forestland and resources, which is convenient for agricultural production. Agricultural land, in contrast to forest land, takes less land and resources, but returns of which are higher.

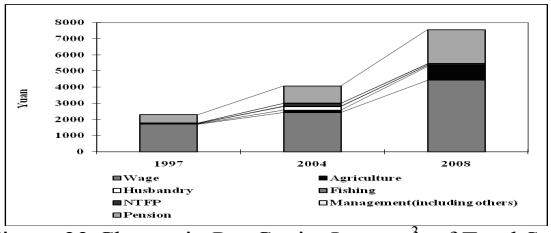

Figure 22 Change in Per Capita Income[3] of Total Sample

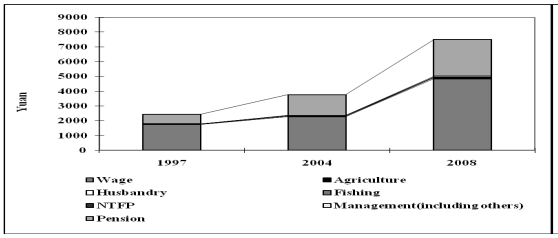

Figure23 Change in Per Capita Income of "Mountain-base" Households

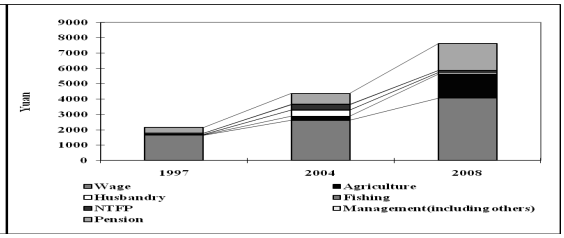

Figure24 Change in Per Capita Income of "Mountain-top" Households

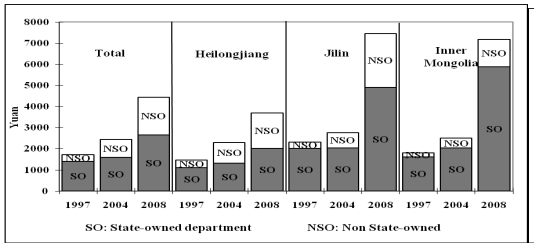

Figure25 Change in the Source Structure of Per Capita Income (divided by the State and Non-state Owned Departments)

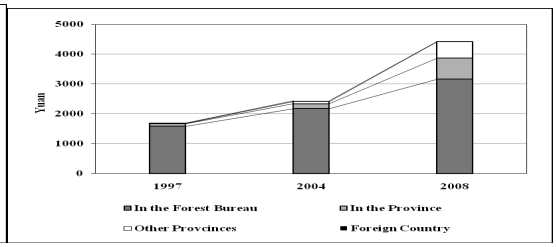

Figure26 Change in the Source Structure of Per Capita Income (divided by the Location)

The importance of wage as an income source, has increased excluding wages

[3] The income data used in Figure22-Figure26 is adjusted to 2008 RMB using regional rural consumer price index (CPI)(ZGTJNJ, various years).

from state-owned or local enterprises (see Figure 25, and 26). Wage income from non state-owned enterprises accounts for 18.39% of the total income in 1997, and increases to 40.19% in 2008, while wages from non-local enterprises increase from 6.78% to 10.68% and 28.48% in 1997, 2004, and 2008, respectively. Therefore, the proportion of wage provided by state-owned enterprises is only about one third of the total, i.e., 35.05% in 2008, as it drops from 60.50% in 1997 to 38.94% in 2004.

The income structure change has shown a transition from mainly based on wage to a simultaneous development in wage, pension and non-wage incomes. Workers' dependence on forest enterprises has decreased to a certain degree, confirming the remarkable achievement of restructuring processing industry and diversifying employment channels.

To sum up, according to a large amount of survey data, the conclusion is confirmed on the improvement in forest resources as well as the growth in economy in froest areas. Resources are improved in terms of both area and timber stock. Forest resource quality is improved, while its structure is further rationalized, and logging scale continues to decline. In forest areas, the economic development is embodied by great success in restructuring forest enterprises, althouth they are still burden heavily with social responsibilities. Meanwhile, workers' income has increased significantly, and their dependence on state-owned forest enterprises decreases to a certain degree.All these improvements in state-owned forest areas can be attributed to both the government's great investment and years of reform efforts in local areas. In the following section we are going to summarize and analyze such reform efforts and practices.

2 Reform Efforts and Practices in State-Owned Forest Areas

Refrom practices in key state-owned forest areas are numerous and have gratifying successes. However, the reform needs to be further deepened, with governemnt's more care and support. It needs to be standardized and to derive new mechanisms in favor of forestry sustainability.

2.1 REFORM PRACTICES ON RESOURCE MANAGEMENT

Innovations in forest resource management generally started in the 80s, but a series of reform practices have concentrated during the period since the implementation of the NFPP in 1998 (see Figure 27). Since the NFPP, in China's key state-owned forest areas, it has welcomed an important historical epoch of reform and innovation.

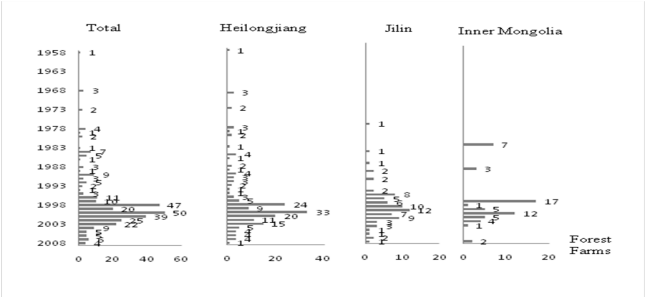

Figure 27 The Number of Forest Farms Initiating Reforms

Household management and market instruments have been widely used in

state-owned forest areas, and become a basic institutional component of natural forest protection and sustainability.

2.1.1 Forest resource protection: Contracted management and led by private sector

Figure 28 shows forest farms, primarily responsible for forest resources protection, have been 100%ly contracted by households in natural forests farms in all our surveyed farms in 2008. The proportion of contracted area, is 73% in Heilongjiang, 53% in Jilin, and 84% in Inner Mongolia. These large shares suggest an important role played by households in forest management. Speaking of contracting mechanisms, 51% of the forestland in Jilin is transferred to individual workers through auction, leasing, etc., while there are 5% of the total forestland, of which the management rights are transferred to social groups, individuals, and companies through market instruments. In Inner Mongolia, 10% of the forestland is formed by workers' replantation, i.e., non-state-owned or household forest farms (see Figure 29). Therefore, it can be inferred that household management has been well developed, while social groups, individuals, and companies' participation in forest management is emerging, and in some areas is well formed.

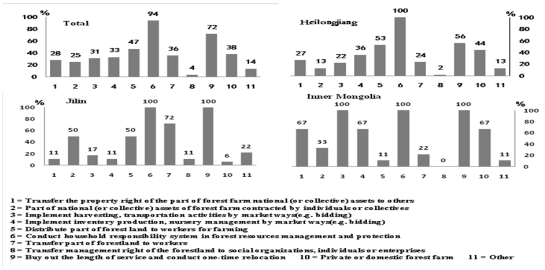

Figure 28 The Percentage of Forest Farms Initiating the Reforms

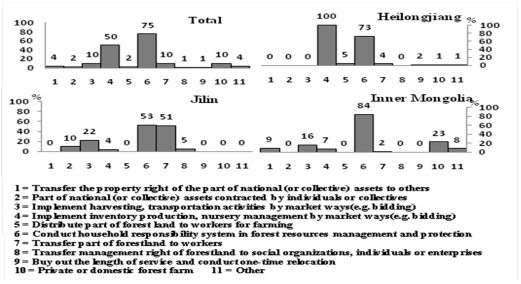

Figure 29 The Percentage of Forest Farms' Area Used in the Reforms

2.1.2 Harvesting and production: dominated by market instruments

With regard to timber harvesting and sivilculture, which is most prominently managed by planning, in a number of forest enterprises several market-oriented mechanisms such as bidding, contracting, etc, are adopted (see Figure 28, and 29). Harvesting cost has been reduced largely, while performance of sivilculture has been significantly improved. By the end of 2008, the extent of marketisation in harvesting and transport is 100% of the forest farms in Inner Mongolia, 22% in Heilongjiang, and 17% in Jilin. With respect to sivilculture and nursery, 67% of the forest farms in Inner Mongolia are using market-based instruments, while this ratio is 36% in Heilongjiang and 11% in Jilin.

Market-based instruments are also utilized by forest farms on the control of tools for harvesting, sivilculture, and nursery, through contracting or leasing to individual employees. In Heilongjiang there are 27% of the total forest farms have fulfilled the transfer of ownership rights, of part of the state-owned or collective-owned asstes. In Jilin this ratio is 11%, and high up to 67% in Inner Mongolia. Speaking of the transferring instruments, in Jilin half of the forest farms contract part of the ownership or management rights to individuals or collectives through market instruments, while in Inner Mongolia this share is 33% and 13% in Heilongjiang. This approach has greatly improved efficiency while at the same time significantly reduced operation

cost of forest farms.

The role of market-based economy is of increasingly importance, with great improvement of the efficiency in forest cultivation, logging, and in special forest resources management. This has guiding and directional implications for future institutional reforms. Market-based instruments are thus confirmed to have directional significance for future institutional reform.

2.2 REFORM PRACTICES ON ECONOMIC GROWTH

2.2.1 Various forms of restructuring processing enterprises

Processing companies, that were widely under loss and characterized by high resource and energy consumption, low output and profit, or great loss, have laid heavy economic burden on forest communities. Since the middle 90s, a large number of state-owned processing enterprises under deficit for many years have followed the trend of reforming state-owned enterprises and restructured themselves, with some success achieved.

A total of 206 sample enterprises (125 in Heilongjiang, 50 in Jilin, and 31 in Inner Mongolia), of which 84 have accomplished restructure by the year of 2004, accounting for 41% of the total, 118 and up to more than 57% by 2008, with some enterprises occurring more than once. Figure 30 and 31 record the numbers and distribution of restructured enterprises, including those who restructured themselves more than once. Figure 30 suggests most of the forestry enterprises restructuring occurred after 1998, and peaked in 2003 and 2004. Figure 31 shows the major reform process is in terms of ownership transfer, corporatization of forest enterprises, contracting, leasing or mortgage, and so on.

Through restructuring, many enterprises have turned into profits, with the emergence of low resource consumption, improved performance, and worker's income growth, etc. Currently some processing enterprises in some areas have not fulfilled restructuring due to some limitations caused by the existing taxation system. However, restructuring is commonly recognized as the only path to survive by the processing industry in stated-owned forest areas. With the introduction of private capital and modern corporation management system through restructuring, it is possible to actually improve efficiency of processing industry and reduce resource consumption, and finally achieve sustainable development. A large amount of reform practices in this area have demonstrated that, state or government should withdraw completely either in direct investment or in management related to forest process industry, but rather encourage private economy and provide service and policy support. Policy support includes, for example, optimizing forest credit and taxation system in favor of the emerging private economic forms on tax incentives and credit conditions.

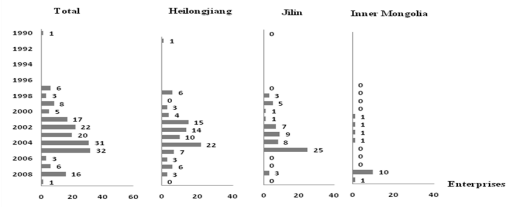

Figure30 The Number of Forest Enterprises Transformed (207 Enterprises)

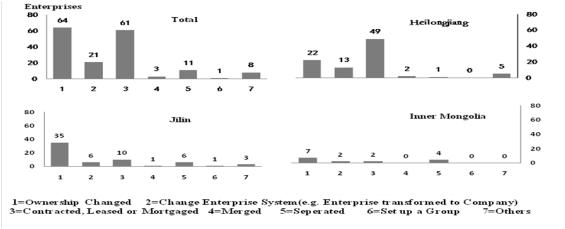

Figure31 The Distribution of Transforming Type of Forest Enterprises (207 Enterprises)

2.2.2 Opportunities from the adjustment of industrial structure

The adjustment of industrial structure has significant effect on the performance of forest enterprises. The restructure of timber processing industry has remarkably weakened its dominant position as before. The primary and tertiary industries have been promoted and achieved rapid growth, and they have played a driving role on forestry economy and facilitating role on offering jobs in forest areas. The output shares of multiple businesses over the total value of social output are increasing (see Figure 32). The growth in Heilongjiang is the largest, with the share increased from 15.48% to 47.58% in 1980-2008 and becoming a major source of social output. This share is up to 15.22% in Jilin and 24.36% in Inner Mongolia. In Figure 33 and 34, multiple output sources are dominated by plantation and livestock, in addition, animal husbandry, collection of non-wood products, and services.

Diversified businesses have contributed largely to resolving problems related to employment. Figure 35 shows, averagely in one forest enterprise, the share of full or part-time employees engaged in these businesses have increased from only 5% of the total population in 1980 to 20% in 2008. This is also consistent with the income changes reviewed in section 1 that, the income proportions of agricultural, non-timber forest products, and non-state-owned jobs, are rising rapidly and gradually becoming the main source of income. This also confirms the notable effectiveness of diversified channels for employment of forest workers.

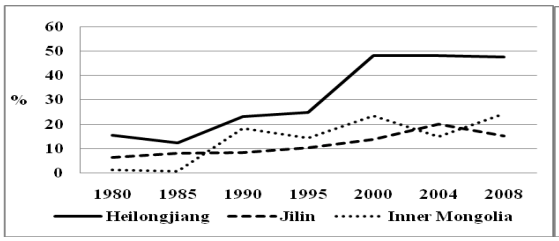

Figure 32 Change in the Percentage of the Multi-industry Production Value in the Total Social Production Value

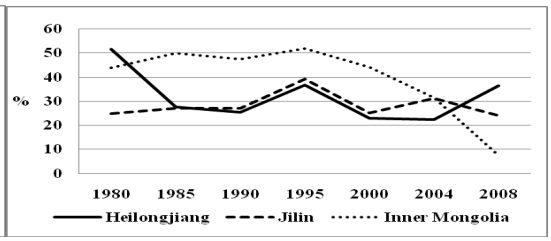

Figure 33 Change in the Percentage of Farming Production Value in the Multi-industry Production Value

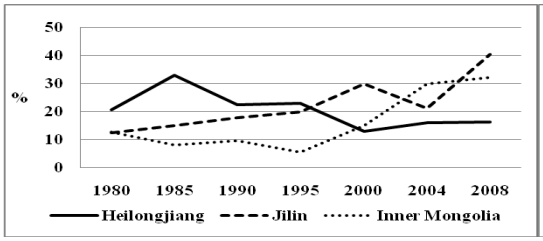

Figure 34 Change in the Percentage of Production Value of the Aquaculture Industry in Multi-industry Production Value

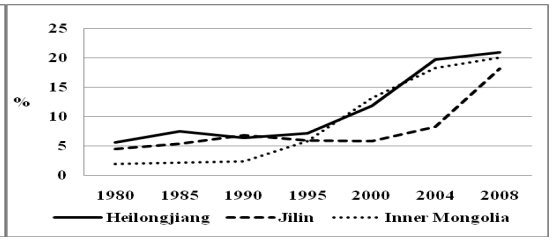

Figure 35 Change in the Percentage of the People Working in Multi-industry in the Population

2.2.3 Labor market: increasingly vibrant

The proportion of laid-off worker has been high up to 40%-50% after 1998 (see Figure 36), which constitutes the main part of labor market. The number of workers moving out for other jobs accounts for more than 10% of the total population of each forest farm (see Figure 37). Both out-going workers and laid-off workers are over 100% in share (see Figure 38). This indicates that, not only laid-off workers are

seeking re-employment, but also a considerable number of workers in roll are diversified employed. In addition, workers' income sources suggest that, their employment has extended to other areas of inside and outside this province, and abroad as well. A vigorous labor market has been gradually in shape.

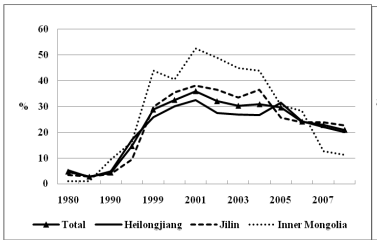

Figure36 Change in Percentage of Laid-Off Workers in Workers Wnrolls

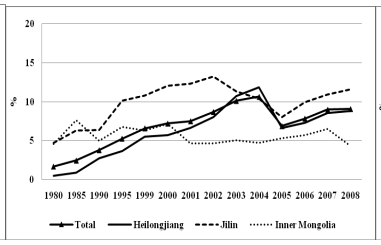

Figure37 Change in Percentage of Migrant Workers in Workers Enrolls

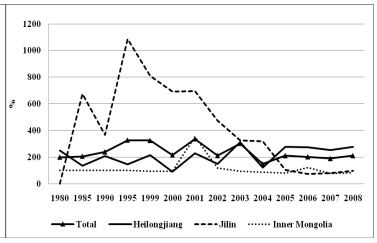

Figure38 Change in Percentage of Migrant Workers in Laid-off Workers

To sum up, the following three trends can be generalized from all the reform practices: new management modes on forest resources, new products/market development, and the formation of new processing patterns. All these practices and trends have laid the foundation for the deepening of state-owned forest reform.

3 Existing Problems in State Forest Area

3.1 PROBLEMS IN RESOURCE MANAGEMENT

3.1.1 There is no improvement in the situation of accessible forest resource depletion

Forest resource conditions in state forest area have been improved, but the situation of resource depletion has not been changed. After implementation of Natural Forest Protection Project for 12 years, the problem of accessible forest resource depletion still exists. This problem is especially severe in Heilongjiang Province. The share of mature forest in total timber stock has been falling continuously and it fell to 3.24% in 2008. There is almost no accessible forest left to be harvested. The accessible forest resource situation is relatively less worrisome in Jilin Province, where the proportion of mature forest in timber stock has been increased in 1990s after the continuous decline during 1980s, and this proportion has been maintained at approximately 1/3 after the implementation of Natural Forest Protection Project. This proportion in Inner Mongolia has also always been kept above 20%, and this number reached 24.89% in 2008 (See Figure 39).

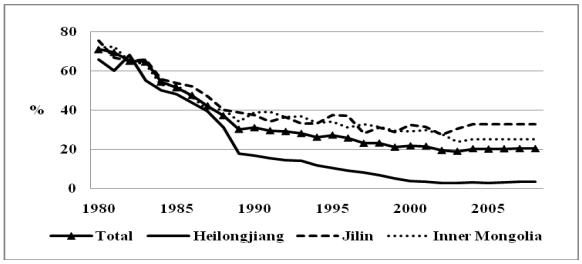

Figure 39 Changes in the Stock Proportion of Mature and Matured Forest in the Timber Forest

Accessible resource depletion is an inevitably serious problem especially in Heilongjiang forest industry bureau that administers 40 state forest bureaus and whose annual permitted logging volume over 4 million cubic meters far exceeds its capacity. According to the resource situation in Heilongjiang Province and the national requirements in forest management plan, permitted logging volume should be further reduced. The main reason to maintain such a large logging volume is to fulfill the needs for economic development of the forest area and subsistence living of its employees. It is hence difficult to resolve the problem of accessible forest resource depletion in Heilongjiang Province in a short term. Although the resource situations are relatively better in Jilin and Inner Mongolia, their logging volumes also exceed their ecologically sound capacities. Therefore, when it is impossible to find reasonable solutions under current institutional arrangements, we have to search for a breakthrough from the resource dependent development model that renders the occurrence of this phenomenon and seek a way out from the institutional reform in the state forest area.

3.1.2 Forest tenure is unclear

Forest certificates in the state forest area are allocated to the forest industrial enterprises, but these enterprises do not pay for using the state-owned forest resources. This has also laid the institutional foundation for the discretional logging or even over-quota harvesting that the enterprises conducted according to their needs. Generally speaking, resource management and monitoring organizations on forest industrial enterprises are established within the enterprises, which perform practically no monitoring function and lead to the insolvable problem of excessive logging. The problem that nobody really cares about the forest resources cannot be tackled as long as such institutions exist.

In fact, State Forestry Administration is the owner of the forest resources in state forest area. However, they lack qualified organizations and personnels at the local level to manage state forests. Provincial and lower level governments grasp the real control over state forest management and personnel, finance and taxation of the forest industrial enterprises. Thus, central government is only the fund provider and nominal owner, whereas local governments are the real owners, users and beneficiaries of the forest resources. Local governments are the agents of the central government in China. Due to the existence of asymmetric information, when the interests are inconsistent between the principal and agents, agents have great incentives to maximize their own interests at the expense of the principal's. As long as the current institutions are at work, the problem of unclear forest tenure is insolvable, and nobody will really care about the restoration of forest resources.

Therefore, a relatively long-term effective natural forest protection mechanism has not been formed in the Northeast Inner-Mongolia state forest area even under the implementation of the Natural Forest Protection Program. Once the project stopped, forest resources might well be further destroyed. State forest area has reached the last moment when it has to undertake institutional reforms.

3.2 PROBLEMS IN ECONOMIC DEVELOPMENT

3.2.1 High Proportion of people in forest area is below poverty line

Figure 40 shows the distribution of per capita annual income of forest worker households in various years. It can be seen that comparing to the newly adjusted Chinese poverty line in 2009 which is 1067 CNY per capita, 8% of the "uphill" workers and 9% of the "downhill" workers laid below the poverty line in 2008. For example, if a state forest bureau administered 10000 households, approximately 1000 households were below the poverty line. This is mainly due to the mass lay-off of workers after the introduction of Natural Forest Protection Program, industrial structure adjustment, and restructuring in processing industry. Poverty was not a big concern when the revenues generated from timber production and processing from natural forests were generally sufficient to cover the operating expenses and social welfare responsibilities of these forest industrial enterprises. However, restructuring in many enterprises gave rise to increased poverty due to the underdevelopment of social security system, and the poverty problem would become more severe in future tenure reforms. Establishing all-round social security system in the forest areas is the key to guaranteeing the success of the reforms and the future sustainable development, and is also the new focus of future government support policies.

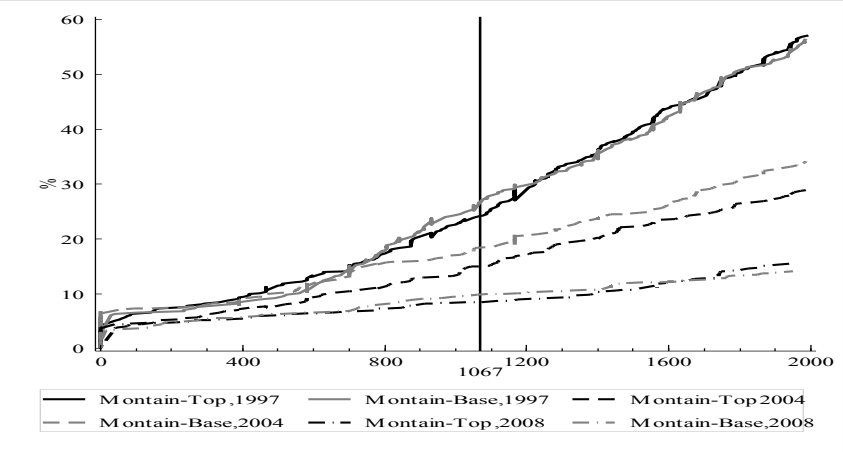

Figure 40 Distributions of Per Capita Income and Poverty Line, 1997, 2004&2008(in 2008RMB)

3.2.2 State forest bureaus still shoulder various heavy burdens

The special background under which the Northeast-Inner Mongolia state forest area was established has resulted in the current situation of its mixed functioning of government administration and enterprise management as well as mixed functioning of social welfare providing and enterprise management. Since forest industrial enterprises are the governments in forest areas, they need to set up departments and positions according to government functions and to support government by their profits. In the meantime, state forest bureaus are required to turn over profits to maintain the functioning of corresponding higher managerial authorities. At the beginning, schools, hospitals and other organizations came into existence because of the establishment of the forest industrial enterprises, so that the enterprises had to play the role of social service providers. Currently, the proportion of retirees in total

workforce in the state forest area is rising. Forest industrial enterprises are fully occupied by meeting these social obligations, whereas their principal functions in terms of responding to the market and organizing production have been weakened in due course.

In summary, the existing problems in state forest area are mainly caused by the mixed functioning of government administration and enterprise management and the highly centralized management system.

4 Conclusions and Policy Recommendations (equivalent to abstract)

4.1 *CONCLUSIONS*

Based on the analysis of the current situation, reform practices and existing problems in state forest area, the following conclusions can be drawn:

Above all, although the reform of Northeast Inner-Mongolia state forest area has not formally started, the innovation that comes from the grass-root level has already been very prevalent;

Secondly, Northeast Inner-Mongolia state forest area has made great progress in various aspects, such as in household-oriented forest resource management, restructuring of processing industry, diversification of operation, marketization of forest production management, etc. However, the maintenance of the reform achievements requires more secure forest tenure.

Thirdly, the situation of forest resources has been improved, but there still exists the problem of accessible resource depletion which makes it impossible for sustainable management.

Fourthly, there has been a tendency that workers' income is growing and income structure is diversifying, but poverty is still a severe concern.

Lastly, the achievements resulting from innovation at the grass-root levels will greatly reduce the cost of the formal reform.

Northeast Inner-Mongolia state forest area has the advantages of abundant forest resources and integral forest industrial system, which lead to a great potential for its future sustainable development. Hence it should employ the newly created institutions and mechanisms due to the preferable policies of Natural Forest Protection Program and those to boost the development of the old northeast industrial base.

4.2 POLICY RECOMMENDATIONS

4.2.1 Reforms in resource management system

Looking at the process of reform and development of Northeast Inner-Mongolia state forest area, the emphasis of institutional innovations so far has been put on the restructuring of processing industry, lease and contracting of forest resource management and protection, and small-scaled operation marketization. The latter two components have been widely operationalized in the collection and cultivation of non-timber forest products, and been gradually developed into harvesting and silviculture sections in some parts of the forest area. The key of the next step in deepening the reform is the tenure reform of the state-owned commercial forest resources.

The reform experience of collective forests suggests that a well-designed and steadily-implemented forest tenure reform can achieve a win-win situation among state, collectives (or enterprises) and worker households. State can mobilize the initiatives of forest practitioners in afforestation and silviculture sections through tenure reform, in order to accomplish the goal of expanding forest resources and of achieving in the meantime social stability and sustainable development of the forest area. Collectives (or enterprises) can collect rent (or contract fee) after the reform to enjoy the rights as landowners hence to obtain a stable source of income for financing their economic development. Individual worker households are the biggest beneficiaries from the tenure reform, since they will become asset owners and operators from pure laborers and they can increase their wealth accumulation through this transformation. On the one hand, they can receive long-term gains through managing timber and other resources; on the other hand, they can grab short-term gains through franchising the forests. This will also improve the risk bearing ability of forest worker households.

4.2.2 Restructuring of processing enterprises and withdrawal of public economy

Reforms in this area have shown that state can fully withdraw from direct investment in forest product processing and management. It can instead provide services and policy support for the development of private economy, such as improving credit system and taxation system in state forest areas, so that newly developed private operators can enjoy the tax deduction and favorable credit treatment as the former state-owned economy enjoyed.

4.2.3 Institutional arrangements envisaged for the state-owned forest industrial enterprises

State-owned forest industrial enterprises function as both government and enterprises. This feature is built on the management of two types of state-owned productive assets - processing industry assets and commercial forest resources.

Currently, the restructuring of processing industry within the forest industrial enterprises has become an irreversible trend. The nature of the state-owned forest industrial enterprises in the future depends critically on the direction of the change in the commercial forest resource management system.

It is conceived that if the key state forest area can learn from the reform experience of collective forest areas, state-owned agricultural reclamation system and state-owned forest farms to contract out the state-owned commercial forests to worker households, the role of state-owned forest industrial enterprises as state-owned productive asset managers will gradually fade out, whereas their role of social service and support provider will be maintained and strengthened. Therefore, the forest industrial enterprises should be converted to pure governments after the tenure reform. Currently, the forest industrial enterprises have already established most of the major government functions and institutions. After the transformation of productive assets, they will no longer receive direct operation profit, but they can continue to provide social services and public goods through tax and land rights (land rental or land contract fee) income. The reform can be accomplished by simply adjusting the current taxation system, which can achieve the transformation of enterprises to governments. This is probably the transition plan that bears the lowest cost and smallest social unrest risk.

It is worth emphasizing that according to the current division of public benefit forests and commercial forests, the commercial forests account for less than 30% of the total area in the Northeast Inner-Mongolia key state forest area. If the tenure reform is kept within the scope of commercial forests, it will not change the situation that forest resources in the state forest area are directly controlled and managed by government authorities or state-owned enterprises, and it is impossible to make a fundamental threat on the stability of the forest ecosystem in Northeast Inner-Mongolia key state forest area. Therefore, risks associated with tenure reforms are small, whereas the potential benefits are immeasurable.

4.2.4 Functional change and reform direction envisaged for the central forestry authorities

The evolution of the problems in key state forest area is largely related to the unclear responsibilities and unreasonable right exercises among the central forestry authorities, local governments and forest industrial enterprises. When local governments are fully responsible for the employment, finance and input provision for the forest industrial enterprises, it is counterproductive to maintain a high degree of intervention from the central authorities. The evolution of the “two-crises” in forest areas indicates the inappropriateness of this administrative system.

While the forestry authorities are promoting classification management, it is probably more urgent to redefine the purview of the administrative rights. The main

driving forces of the redefinition are to save administrative costs and align rights with responsibilities so as to provide appropriate incentives to the administrators. One thought about how this redefinition could be done is as follows:

Firstly, local public forest system should be expanded, and most of the state-owned forests in the key state forest area should be decentralized entirely to the administration of local governments and ensured to be not subject to the jurisdiction of central forestry authorities any longer;

Secondly, only a small proportion of the forests in state forest area that have substantial ecological value and significant national or cross-district ecological functions should be categorized as state-owned forests and managed directly by the central forestry authorities. By doing so, on the one hand, it can pool resources together and increase investment to ensure the protection of forests; on the other hand, it can also provide a demonstration or model of forest resource protection and management for local organizations and research institutes.

Thirdly, the state forestry authorities should withdraw from direct management of the majority of public forests. They should instead focus on nationwide public goods provision such as research, extension services and demonstrations.

Lastly, after stopping taking full responsibility of the forest sector, central forestry authorities can establish policy fund for forest projects according to national forestry development plan and implement such projects through bidding. They can mobilize individual and social resources in a way that accords with national interests to enhance forestry development.

Appendix

Table1 Change in the Forested-land Area

Unit: 10000Ha

Year	Heilongjiang	Jilin	Inner Mongolia
1980	16.71	17.09	20.37
1981	16.53	16.48	20.24
1982	16.35	16.04	20.86
1983	16.17	16.29	20.89
1984	15.99	16.12	21.14
1985	16.41	16.02	22.74
1986	16.32	15.99	25.75
1987	16.02	16.01	26.50
1988	16.14	16.17	26.34
1989	16.78	16.19	29.26
1990	16.89	16.20	29.13
1991	16.87	16.32	29.73
1992	17.15	16.41	30.64
1993	17.51	16.53	30.53
1994	17.92	16.72	30.28
1995	18.44	16.89	32.80
1996	18.44	17.11	33.07
1997	18.48	17.17	33.04
1998	18.79	17.40	32.98
1999	19.17	17.47	33.77
2000	19.64	17.57	34.10
2001	20.04	17.62	34.09
2002	20.26	17.64	34.18
2003	20.39	17.69	34.16
2004	20.51	17.68	34.03
2005	20.48	17.69	34.13
2006	20.50	17.70	34.28
2007	20.69	17.74	34.36
2008	20.75	17.86	34.44

Table2 Change in the Forested-land Volume

Unit:1,000,000M3

Year	Heilongjiang	Jilin	Inner Mongolia
1980	18.76	23.20	15.42
1981	18.28	22.47	15.74
1982	17.80	22.49	15.92

1983	17.33	23.02	15.96
1984	16.85	22.92	16.33
1985	16.85	22.61	19.13
1986	16.16	22.64	21.16
1987	16.08	21.79	21.15
1988	15.03	21.62	21.10
1989	14.27	21.55	25.33
1990	14.27	21.50	25.38
1991	14.35	21.52	25.12
1992	14.42	21.62	25.75
1993	14.62	21.83	25.85
1994	14.58	21.96	25.96
1995	14.31	22.03	26.25
1996	14.35	22.43	25.72
1997	14.35	22.26	25.89
1998	14.20	22.44	26.05
1999	13.89	22.59	25.67
2000	13.80	22.52	26.84
2001	14.12	22.86	26.63
2002	13.97	23.10	27.12
2003	14.22	23.37	27.54
2004	14.71	23.60	27.79
2005	15.45	23.76	27.03
2006	15.90	23.91	27.16
2007	16.59	24.02	27.71
2008	17.13	24.12	28.26

Table3 Change in Per Hectare Volume of the Forested-land

Unit:M3/Ha

Year	Heilongjiang	Jilin	Inner Mongolia
1980	108.27	138.55	75.39
1981	106.38	138.21	76.34
1982	104.69	141.12	74.61
1983	103.08	141.77	74.49
1984	101.49	142.96	74.34
1985	98.76	141.61	81.19
1986	96.64	142.00	80.64
1987	97.92	136.45	78.34
1988	91.72	133.11	78.54
1989	84.32	132.58	82.40
1990	83.54	131.43	82.99
1991	84.13	130.25	80.89
1992	83.73	130.14	81.01

1993	82.97	130.31	81.62
1994	79.90	129.56	83.45
1995	78.06	128.63	77.55
1996	77.87	129.18	75.59
1997	77.25	128.16	76.20
1998	75.22	127.94	76.82
1999	71.44	128.02	74.12
2000	68.24	126.75	77.40
2001	68.38	128.16	76.66
2002	67.19	129.28	78.04
2003	68.31	130.65	79.43
2004	70.30	132.20	80.49
2005	74.20	133.00	77.78
2006	76.27	133.80	77.70
2007	79.04	134.52	79.45
2008	81.30	134.43	81.18

Table4 Change in the Structure of Forest Land Area

Unit:%

Year	Forested land	Scattered trees	Shrub land	Young forests	Tree nursery	Non-forested land
1980	78.79	6.90	0.72	4.57	0.03	9.34
1997	87.33	1.32	0.32	5.16	0.03	4.51
2008	89.99	0.35	0.76	1.20	0.03	0.63

Table5 Change in the Structure of Forest Stands Area

Unit:%

Year	Timber forest	Shelterbelt	Fuelwood forest	Forests for special purposes
1980	92.00	4.57	0.13	6.15
1997	92.62	5.27	0.24	2.11
2008	33.44	56.07	0.00	0.00

Table6 Change in Timber Production

Unit:10000M3

year	Heilongjiang	Jilin	Inner Mongolia
1980	44.38	36.83	57.36
1985	41.72	34.44	52.83
1990	37.90	29.10	59.08
1995	25.76	26.54	48.09
1998	24.00	18.39	43.91
1999	22.33	17.19	37.79
2000	18.40	14.23	33.94
2001	16.30	12.75	31.42

2002	15.66	12.38	32.43
2003	14.56	11.49	31.99
2004	13.25	12.16	38.37
2005	13.69	13.90	31.46
2006	13.65	13.84	20.72
2007	13.47	13.36	20.53
2008	13.68	13.68	22.44

Table7 Change in the Percentage of Production Value of the Primary Industry in the Total Production Value of Society

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	9.76	3.72	1.64
1985	11.58	4.95	1.25
1990	17.32	4.59	7.50
1995	15.20	9.29	7.73
2000	21.42	31.92	29.40
2004	42.98	45.97	63.14
2008	44.46	65.34	46.42

Table8 Change in the Percentage of the Production Value of the Secondary Industry in the Total Production Value of Society

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	82.19	93.48	93.51
1985	76.81	87.66	95.04
1990	76.15	89.91	91.46
1995	71.21	81.69	82.62
2000	56.62	51.39	62.97
2004	37.38	30.25	21.57
2008	37.11	14.67	34.05

Table9 Change in the Percentage of the Production Value of the Tertiary Industry in the Total Production Value of Society

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	9.40	2.79	4.85
1985	13.55	4.78	3.71
1990	7.96	5.50	1.14
1995	12.68	9.08	9.65
2000	21.96	16.69	8.65
2004	19.64	23.07	15.29
2008	17.22	19.98	19.53

Table10 Change of "On the Position" Workers

Unit: Person

Year	Heilongjiang	Jilin	Inner Mongolia
1980	9214	9022	5155
1981	9958	9184	5391
1982	9955	9251	5610
1983	9971	10522	5748
1984	10051	10899	6046
1985	10326	9601	6426
1986	10871	9855	8196
1987	11408	10045	8512
1988	11432	10424	8497
1989	11390	10415	8733
1990	11481	9470	8589
1991	11654	9712	8562
1992	11288	9682	8901
1993	11284	10556	7924
1994	11434	12609	8049
1995	11584	10816	8120
1996	11206	12240	8128
1997	11072	13244	7985
1998	11682	11460	6339
1999	8672	7702	5929
2000	7569	7902	5375
2001	6828	6947	4746
2002	6477	6074	4388
2003	7066	5305	4323
2004	6979	5275	4576
2005	6609	4994	4357
2006	6354	3784	4666

Table11 Change of the Percentage of "On-the-position" Workers in the Population

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	26.17	27.67	23.48
1981	28.42	24.29	22.62
1982	27.98	24.12	23.78
1983	27.78	23.60	24.40
1984	27.98	24.28	25.31
1985	28.73	28.44	25.93
1986	30.14	35.04	32.92

1987	31.73	35.23	35.07
1988	31.88	37.26	34.27
1989	31.89	36.90	35.08
1990	32.81	34.55	38.12
1991	34.21	33.52	38.28
1992	32.80	34.49	38.32
1993	33.03	36.79	33.64
1994	32.28	44.92	33.07
1995	32.55	38.97	33.85
1996	32.14	44.31	34.31
1997	31.53	48.97	34.53
1998	33.77	41.67	28.82
1999	25.06	28.30	27.31
2000	22.52	29.18	25.01
2001	20.15	26.19	23.20
2002	17.93	24.82	23.05
2003	18.31	20.18	23.96
2004	20.29	20.39	26.27
2005	17.20	19.40	24.24

Table12 Change in the Number of Hospital Staff

Unit：Person

Year	Heilongjiang	Jilin	Inner Mongolia
1980	256	181	160
1981	271	194	168
1982	275	206	175
1983	283	211	181
1984	286	209	189
1985	293	224	201
1986	294	245	256
1987	282	250	256
1988	280	263	225
1989	284	283	246
1990	287	269	246
1991	287	275	260
1992	299	272	266
1993	292	275	300
1994	284	270	315
1995	283	266	312
1996	273	275	315
1997	262	268	316
1998	289	274	253

1999	275	269	229
2000	274	262	217
2001	271	275	205
2002	277	257	171
2003	282	250	183
2004	285	241	150
2005	287	251	150

Table13 Change in the Percentage of the Number of Hospital Staff in the Number of"On-the-position" Workers

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	2.80	2.38	3.02
1981	2.74	2.81	3.02
1982	2.80	3.02	3.03
1983	2.88	3.29	3.03
1984	2.88	3.30	3.03
1985	2.86	2.86	3.03
1986	2.74	2.57	3.03
1987	2.52	2.60	2.94
1988	2.50	2.57	2.60
1989	2.53	2.76	2.75
1990	2.54	2.82	2.80
1991	2.49	2.85	2.96
1992	2.68	2.85	2.91
1993	2.63	2.66	3.75
1994	2.53	2.13	3.90
1995	2.57	2.48	3.82
1996	2.51	2.27	3.86
1997	2.44	2.04	3.97
1998	2.53	2.47	4.05
1999	3.30	3.71	3.98
2000	3.79	3.50	4.20
2001	4.22	4.16	4.63
2002	4.60	4.37	4.09
2003	4.52	4.91	4.43
2004	4.44	4.67	3.31
2005	4.68	5.18	3.50

Table14 Change in the Number of School Staff

Unit：Person

Year	Heilongjiang	Jilin	Inner Mongolia
1980	802	495	389

1981	820	511	408
1982	818	500	425
1983	813	512	436
1984	857	528	457
1985	873	554	485
1986	909	571	620
1987	871	644	624
1988	888	642	612
1989	875	633	608
1990	868	594	622
1991	874	561	577
1992	837	537	570
1993	812	566	634
1994	772	570	667
1995	754	557	661
1996	707	546	667
1997	645	541	666
1998	714	529	532
1999	689	527	482
2000	697	510	458
2001	690	521	430
2002	710	495	341
2003	723	500	360
2004	732	541	362
2005	741	486	363

Table15 Change in the Percentage of the Number of School Staff in the Number of "On-the-positin" Workers

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	8.80	6.90	7.32
1981	8.25	6.66	7.31
1982	8.23	6.14	7.32
1983	8.18	6.47	7.32
1984	8.51	6.28	7.32
1985	8.48	7.22	7.32
1986	8.43	6.18	7.32
1987	7.70	6.68	7.15
1988	7.95	6.37	7.06
1989	7.77	6.24	6.82
1990	7.68	6.53	7.09
1991	7.66	5.99	6.63
1992	7.53	5.80	6.26
1993	7.28	5.78	7.84

1994	6.84	4.75	8.17
1995	6.83	5.33	8.00
1996	6.45	4.61	8.08
1997	5.95	4.04	8.29
1998	6.16	4.76	8.47
1999	8.22	7.36	8.32
2000	9.69	6.72	8.81
2001	10.60	7.80	9.63
2002	11.27	8.34	8.09
2003	10.92	9.73	8.49
2004	10.98	10.21	8.00
2005	11.44	10.10	8.50

Table16 Change in the Number of Retirees

Unit：Person

Year	Heilongjiang	Jilin	Inner Mongolia
1980	990	1565	838
1981	1240	1576	827
1982	1490	1587	841
1983	1780	1620	835
1984	2163	1706	892
1985	2131	1799	1036
1986	2652	1904	1532
1987	2860	2010	1647
1988	3058	2115	1844
1989	3147	2220	1817
1990	2838	2105	1843
1991	3204	2253	1913
1992	3467	2397	2322
1993	3696	2541	2377
1994	3828	2640	2383
1995	4169	2739	2395
1996	3841	2840	2453
1997	4162	2942	2641
1998	4304	3043	2930
1999	4545	3145	2868
2000	4016	3246	2979
2001	4033	3320	2993
2002	4116	3460	3032
2003	4092	3442	2958
2004	4032	3678	3043
2005	4056	3593	3026
2006	4406	3882	3089

Table17 Change in the Percentage of the Number of Retirees in the Number of "On-the-position" Workers

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	10.84	24.75	15.78
1981	12.47	33.59	15.53
1982	14.99	33.88	15.52
1983	18.90	22.43	15.03
1984	21.63	23.41	15.06
1985	20.68	24.53	15.95
1986	23.74	19.07	18.05
1987	24.44	19.78	18.65
1988	26.10	19.97	21.13
1989	27.44	20.95	20.13
1990	24.72	22.02	20.69
1991	27.25	22.87	21.71
1992	30.51	24.90	25.22
1993	32.58	24.85	29.13
1994	33.49	20.72	29.15
1995	36.03	25.39	29.00
1996	34.25	23.08	29.70
1997	37.53	21.97	33.07
1998	36.76	26.43	47.30
1999	52.94	42.25	48.91
2000	53.34	42.24	56.49
2001	59.48	49.96	64.32
2002	63.40	58.84	71.31
2003	62.89	64.44	69.37
2004	61.27	68.57	67.86
2005	65.02	73.53	71.45
2006	73.74	119.23	66.93

Table22 Change in Per Capita Income of Households

Unit:Yuan

	1997	2004	2008
Wage	1708.19	2435.42	4434.71
Agriculture	26.17	144.95	862.25
Husbandry	17.78	228.38	65.23
Fishing	0.26	8.25	3.89
NTFP	34.10	173.46	70.52
Management(including others)	5.60	24.61	37.58

Pension	512.37	1050.79	2093.47
Total	2304.47	4065.87	7567.67

Table23 Change in Per Capita Income of "Mountain-base" Households
Unit:Yuan

	1997	2004	2008
Wage	1768.96	2269.64	4852.75
Agriculture	3.39	19.85	80.44
Husbandry	18.42	54.48	11.56
Fishing	0.53	0.13	8.22
NTFP	2.18	8.77	4.56
Management(including others)	6.71	16.49	79.32
Pension	656.06	1400.18	2473.59
Total	2456.25	3769.53	7510.43

Table24 Change in Per Capita Income of "Mountain-top" Households
Unit:Yuan

	1997	2004	2008
Wage	1647.09	2602.11	4058.21
Agriculture	49.07	270.74	1566.37
Husbandry	17.13	403.25	113.57
Fishing	0.00	16.42	0.00
NTFP	66.19	339.07	129.94
Management(including others)	4.49	32.78	0.00
Pension	367.87	699.48	1751.13
Total	2151.84	4363.84	7619.22

Table25 Change in the Source Structure of the Per Capita Income of Households(divided by the State and Non-state Owned Departments)
Unit:Yuan

		1997	2004	2008
Total	State-Owned department	1394.13	1583.24	2652.46
	Non State-Owned Department	314.06	852.18	1782.25
Heilongjiang	State-Owned department	1104.30	1318.04	2003.45
	Non State-Owned Department	345.15	974.65	1682.97
Jilin	State-Owned department	2014.99	2037.61	4908.65
	Non State-Owned Department	294.81	722.19	2529.26
Inner Mongolia	State-Owned department	1616.48	2027.73	5886.17
	Non State-Owned Department	185.90	469.10	1291.26

Table26 Change in the Source Structure of Per Capita Income of Households(divided by the Location)
Unit:Yuan

Location	1997	2004	2008
Forest Bureau	1592.46	2175.40	3171.89
Local Province	81.31	155.05	695.07
Other Provinces	16.35	89.16	555.52
Foreign Country	18.07	15.81	12.24
Total	1708.19	2435.42	4434.71

Table27 The Number of Forest Farms Initiating Reforms

Unit:Forest Farm

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1958	1	1	0	0
1959	0	0	0	0
1960	0	0	0	0
1961	0	0	0	0
1962	0	0	0	0
1963	0	0	0	0
1964	0	0	0	0
1965	0	0	0	0
1966	0	0	0	0
1967	0	0	0	0
1968	3	0	0	0
1969	0	3	0	0
1970	0	0	0	0
1971	0	0	0	0
1972	0	0	0	0
1973	2	2	0	0
1974	0	0	0	0
1975	0	0	0	0
1976	0	0	0	0
1977	0	0	0	0
1978	4	3	1	0
1979	1	1	0	0
1980	2	2	0	0
1981	0	0	0	0
1982	0	0	0	0
1983	1	1	0	0
1984	7	0	0	7
1985	5	4	1	0
1986	1	1	0	0
1987	0	0	0	0
1988	3	2	1	0
1989	1	1	0	0
1990	9	4	2	3

1991	3	3	0	0
1992	5	3	2	0
1993	2	2	0	0
1994	1	1	0	0
1995	3	1	2	0
1996	11	3	8	0
1997	10	5	5	0
1998	47	24	6	17
1999	20	9	10	1
2000	50	33	12	5
2001	39	20	7	12
2002	25	11	9	5
2003	22	15	3	4
2004	9	5	3	1
2005	5	4	1	0
2006	5	4	1	0
2007	6	4	2	0
2008	4	1	1	2

Table28 The Percentage of Forest Farms Initiating the Reforms

Unit：%

code	Reform	Total	Heilongjiang	Jilin	Inner Mongolia
1	Transfer the property right of the part of forest farm national (or collective) assets to others	28	27	11	67
2	Part of national (or collective) assets of forest farm contracted by individuals or collectives	25	13	50	33
3	Implement harvesting, transportation activities by market ways(e.g. bidding)	31	22	17	100
4	Implement inventory production, nursery management by market ways(e.g. bidding)	33	36	11	67
5	Distribute part of forest land to workers for farming	47	53	50	11
6	Conduct household responsibility system in forest resources management and protection	94	100	100	100
7	Transfer part of forestland to workers	36	24	72	22
8	Transfer management right of the forestland to social organizations, individuals or enterprises	4	2	11	0
9	Buy out the length of service and conduct one-time relocation	72	56	100	100
10	Private or domestic forest farm	38	44	6	67
11	Other	14	13	22	11

Table29 The Percentage of Forest Farms' Area Used in the Reforms

Unit:%

Code	Reform	Total	Heilongjiang	Jilin	Inner Mongolia
1	Transfer the property right of the part of forest farm national (or collective) assets to others	4	0	0	9
2	Part of national (or collective) assets of forest farm contracted by individuals or collectives	2	0	10	0
3	Implement harvesting, transportation activities by market ways(e.g. bidding)	10	0	22	16
4	Implement inventory production, nursery management by market ways(e.g. bidding)	50	100	4	7
5	Distribute part of forest land to workers for farming	2	5	0	0
6	Conduct household responsibility system in forest resources management and protection	75	73	53	84
7	Transfer part of forestland to workers	10	4	51	2
8	Transfer management right of the forestland to social organizations, individuals or enterprises	1	0	5	0
9	Buy out the length of service and conduct one-time relocation	1	2	0	0
10	Private or domestic forest farm	10	1	0	23
11	Other	4	1	0	8

Table30 The Number of Forest Enterprises Transformed (207 enterprises)

Unit: Enterprise

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1990	1	1	0	0
1997	6	6	0	0
1998	3	0	3	0
1999	8	3	5	0
2000	5	4	1	0
2001	17	15	1	1
2002	22	14	7	1
2003	20	10	9	1
2004	31	22	8	1
2005	32	7	25	0
2006	3	3	0	0
2007	6	6	0	0
2008	16	3	3	10
2009	1	0	0	1

Table31 The Distribution of Transforming Type of Forest Enterprises

Unit: Enterprise

Code	Transformation type	Total	Heilongjiang	Jilin	Inner Mongolia
1	Ownership Changed	64	22	35	7
2	Change Enterprise System(e.g. Enterprise transformed to Company)	21	13	6	2
3	Contracted, Leased or Mortgaged	61	49	10	2
4	Merged	3	2	1	0
5	Separated	11	1	6	4
6	Set up a Group	1	0	1	0
7	Others	8	5	3	0

Table32 Change in the Percentage of the Multi-industry Production Value in the Total Social Production Value

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	15.48	6.32	1.23
1985	12.34	7.99	0.79
1990	23.18	8.39	18.19
1995	24.99	10.37	14.23
2000	48.15	13.90	23.42
2004	48.02	19.93	15.00
2008	47.58	15.22	24.36

Table33 Change in the Percentage of Farming Production Value in the Multi-industry Production Value

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	51.75	24.78	43.82
1985	27.74	27.03	49.91
1990	25.51	26.97	47.49
1995	36.87	39.11	51.90
2000	22.94	25.03	44.23
2004	22.51	31.20	31.54
2008	36.47	24.13	7.60

Table34 Change in the Percentage of Production Value of the Aquaculture Industry in the Multi-industry Production Value

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	20.78	12.56	12.76

1985	33.13	15.00	8.12
1990	22.43	18.02	9.81
1995	22.95	19.86	5.57
2000	12.99	30.08	15.07
2004	16.06	21.22	29.94
2008	16.29	40.47	32.22

Table35 Change in the Percentage of the People Working in the Multi-industry in the Population

Unit:%

Year	Heilongjiang	Jilin	Inner Mongolia
1980	5.54	4.51	1.87
1985	7.49	5.33	2.10
1990	6.37	6.79	2.39
1995	7.09	5.85	5.80
2000	11.75	5.84	13.14
2004	19.74	8.20	18.23
2008	20.87	18.10	20.00

Table36 Change in the Percentage of Laid-Off Workers in Workers Enrolls

Unit:%

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1980	4.69	5.31	3.46	0.95
1985	2.73	2.68	2.77	0.97
1990	4.31	4.89	3.74	9.49
1995	14.60	17.14	9.51	16.26
1999	28.82	25.79	29.83	43.95
2000	32.56	30.16	35.49	40.52
2001	35.97	32.46	38.02	52.62
2002	32.07	27.43	36.46	49.01
2003	30.31	26.83	33.59	44.84
2004	30.90	26.72	36.57	43.88
2005	29.60	31.54	25.71	30.55
2006	24.12	24.29	23.81	28.32
2007	22.79	22.15	23.85	12.64
2008	20.91	19.99	22.60	11.26

Table37 Change in the Percentage of Migrant Workers in Workers Enrolls

Unit：%

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1980	1.67	0.51	4.72	4.60
1985	2.44	0.91	6.27	7.64
1990	3.78	2.72	6.35	5.01

1995	5.27	3.68	10.15	6.77
1999	6.60	5.48	10.82	6.33
2000	7.21	5.68	12.08	7.19
2001	7.51	6.65	12.30	4.63
2002	8.70	8.04	13.25	4.62
2003	10.12	10.74	11.34	5.06
2004	10.64	11.84	10.41	4.74
2005	6.87	6.63	8.03	5.33
2006	7.85	7.27	9.95	5.68
2007	8.99	8.57	10.92	6.52
2008	9.08	8.81	11.56	4.33

Table38 Change in the Percentage of Migrant Workers in Laid-Off Workers

Unit：%

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1980	200.00	250.00	0.00	100.00
1985	206.75	134.44	675.00	100.00
1990	239.07	207.65	369.21	100.00
1995	327.37	145.07	1086.58	100.00
1999	324.92	215.89	808.97	96.00
2000	216.92	92.69	692.02	96.00
2001	336.58	228.53	697.25	353.68
2002	212.67	150.80	473.23	120.21
2003	303.19	311.87	324.76	95.45
2004	149.07	122.36	317.71	87.79
2005	211.48	276.54	103.51	80.00
2006	203.16	275.40	74.50	123.33
2007	189.81	252.44	82.21	76.90
2008	210.99	277.58	99.80	85.56

Table39 Changes in the Stock Proportion of Mature and Matured Forest in the Timber Forest

Unit：%

Year	Total	Heilongjiang	Jilin	Inner Mongolia
1980	70.89	65.64	75.27	71.75
1981	69.47	60.00	66.74	72.20
1982	64.96	68.00	65.10	64.82
1983	64.53	55.00	65.54	63.52
1984	54.29	50.00	55.80	52.79
1985	51.45	47.88	53.63	52.83
1986	47.54	43.79	52.09	46.73
1987	42.16	39.51	47.06	39.91

1988	37.15	31.10	39.95	40.40
1989	30.15	17.68	38.56	34.20
1990	30.94	16.74	37.43	38.66
1991	29.45	15.45	33.97	38.91
1992	29.04	14.36	36.47	36.30
1993	27.99	14.15	33.04	36.77
1994	26.09	11.85	32.98	33.43
1995	27.17	10.23	37.39	33.91
1996	25.69	9.05	36.90	31.12
1997	22.98	8.12	28.21	32.60
1998	23.10	6.85	30.99	31.48
1999	20.99	4.93	28.81	29.24
2000	21.68	3.66	32.40	28.97
2001	21.48	3.30	31.42	29.73
2002	19.33	2.78	27.55	27.67
2003	18.88	2.61	30.47	23.56
2004	20.22	3.15	32.60	24.89
2005	20.03	2.61	32.60	24.89
2006	20.20	3.11	32.60	24.89
2007	20.25	3.26	32.60	24.89
2008	20.25	3.24	32.60	24.89