

# UNDERLYING CAUSES OF LAND USE CHANGE AND DEGRADATION OF NATURAL RESOURCES IN THE AMUR BASIN

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## INTRODUCTION

Within the Amur River basin, various human activities have been affected on natural resources, which resulted degradation of resources and land use change. In Russian part of the basin, farm land development is not significant recently and after the collapsing of planned economy, many of the farm land were abandoned. Large area of the basin is still covered with forest and degradation of forest resources is major problems not only from environmental point of view but also for the sustainable forest industry. On the contrary, in Chinese part of the basin, farmland has been rapidly developed and major causes for land use change.

Under these situations, socio economic group will focus our study on farmland development in Sanjiang plain and forest degradation in Khabarovsk Krai.

## A. UNDERLYING CAUSES OF DEGRADATION OF FOREST RESOURCES IN Khabarovsk KRAI

### IDENTIFICATION OF ISSUE

In Khabarovsk krai, it is commonly acknowledged that forest resources has been degraded and major cause of degradation is forest fire and logging activities. The ratio of younger forest and soft broadleaf forest has continued to increase. These indicate that forest resources in Khabarovsk krai have significantly degraded.

Major causes for the degradation of forest are considered to be the fire, followed by logging activities. Statistics showed that about 70 to 90% of forest fire was caused by human activities.

Though volume of harvest was never exceed the annual allowable cut, it is widely acknowledged that timber harvest is major causes of forest degradation. Figure 1 showed trend of volume of timber harvest by district. Lower Ussuri district, which has longest history of logging activities in the krai, decrease the harvest volume due to exhaustion of resources. Previous studies pointed out that logging activities were targeted on accessible and high quality forest, and were carried out in high-grading and improper method. So far, the forest development strategy in the Russian Far East is "Cut and Run", and major causes for forest degradation.

Currently, Russian forest related institution is under major revision. In 2004, Federal forest administrative organization was changed and, Forest Agency was established as "agency" to carry out forest policy and management, and function of Ministry of Natural Resources was set as policy formulation entity. Separation of function between Agency and

Ministry is still not clear and more over drastic reorganization of leskhozoes are expecting. Forest Code of 1997 is also under major revision. The discussion on the code has been confusing but fundamental direction is to give more freedom to the concessionaire. Centralization of political system, including abolishment of election of governors, will also effect on local forest policy. These institutional revisions will effect on local forest management significantly, and need to be analysis as a background of forest management.

Another important current issue concerning forestry is rapid increase of timber export to China. Volume of timber export to China form The Far East in 2004 is estimated as 6.4 million cubic meters and far exceeds the amount to Japan. Chinese timber business is also become active in the Far East. It is widely acknowledged that timber business with China has often connected with black market and illegal logging.

Under these conditions, the research will focus on following topics.

- 1) Historical analysis of forest development in Khabarovsk krai
- 2) Underlying causes of forest fire in Khabarovsk krai
- 3) Impact of Chinese timber import
- 4) Reorganization of forestry administration and revision of forest code as background

## **RESEARCH FRAMEWORK**

- 1) Historical analysis of forest development in Khabarovsk krai

Research will be conducted in Khabarovsk krai, excluding northern three raions, as these areas have no commercial timber production. Firstly, development of lespromkhozoes (state forest industry enterprises) will be analyzed, based on documents and statistics. Process of establishment, assignment of forest, and development of production activities will be analyzed and geographical shifting of timber harvest activities will be studied out. If precise resource and forest fire data could be obtained, relation between resource degradation, occurrence of fires and forest development will also analyzed.

More in detailed analysis will be conducted in Lazo raion. We are planning to focus on Cita area, but might be change the area dependent on the availability of data. More precise analysis of process of forest development will be conducted, based on data of forest management unit and timber harvesting unit. Through these study, “Cut and Run” process will be proved and alternative method for forest development could be proposed. Community survey will also conducted and clarify the impact of “Cut and Run” strategies on rural community.

To conduct this study, problem of calculation of annual allowable cut, distribution of cutting right, assignment of logging area, and method of logging will be focus of discussion.

- 2) Underlying causes of forest fire in Khabarovsk krai

Through our previous research, we collected basic statistical data of forest fire in Khabarovsk and Primorsk Krai, and also fire prevention and fighting system. We already identified areas with high fires risk, importance of anthropogenic factors, and deterioration of fire fighting and extinguish system.



Research will focus on socio-economic background of forest fire in southern part of Khabarovsk Krai. Case studies will be conducted for each forest fire and socio-economic background of causes of these fires will be analyzed. As prescribed burning is one of the major causes for forest fire, farm management structure and farming method will be surveyed.

We also analyze impact of administrative reorganization on fire prevention and fighting system. Budget flow will be also traced.

### 3) Impact of Chinese timber import

Through our previous research, we collected basic statistics of timber flow from Russia and China, and also preliminary study on Chinese timber industry using Russian timber was conducted. Major result was as follows; major causes of rapid timber increase was Chinese rapid economic development and forest protection policy; timber import of China from Russian Far East in 2004 was estimated as 6.4million cubic meters; ration of hardwood is high, if we compare export to Japan.

Followed by previous study, we will continue to collect statistical data concerning China-Russia timber trade. As Chinese timber business activities in Russia have become developed, we also planned to survey these activities. But as these often connected with black market, and in generally Chinese business have a strong guard it is expected difficulties to conduct these survey. To identify demand structure of Russian timber in Chinese market, Russian timber flow in China and industrial structure using Russian timber will be analyzed through statistical and case studies.

### 4) Reorganization of forestry administration and revision of forest code as background

As mentioned earlier, Russian forestry institution is currently under major revision. We already collected information on administrative reorganization and process of revision of forest code. And will continue to collect information.

As Putin administration is restructuring relationship between Federal and local government, we also identify the effect of these restructure on forest related activities. We especially keep watch on political structure of Khabarovsk krai government.

## **B. DEVELOPMENT OF WATER FACILITIES AND FARM LAND AND LAND USE CHANGE IN SANJIANG PLAIN**

### **BACKGROUND**

Northeastern part of China is major food supplying area, and traditionally field crop such as soybeans, wheat, and corn are major production items. However, since 1980's, paddy field development has become active, including development using international aid, and water use by paddy field has increased. Sanjiang Plain is one of the major paddy field development area in the northeastern China, and large investment for irrigation facilities have been carried out. Irrigation systems mainly use underground water for irrigation. In Heilongjiang province, area of paddy field was rapidly increased from 200,000 ha in 1980 to 1.6 million ha in 2000. However, these paddy field developments has resulted environmental

problems such as destruction of wetland, and Agricultural policy has changed to hold down the paddy field development.

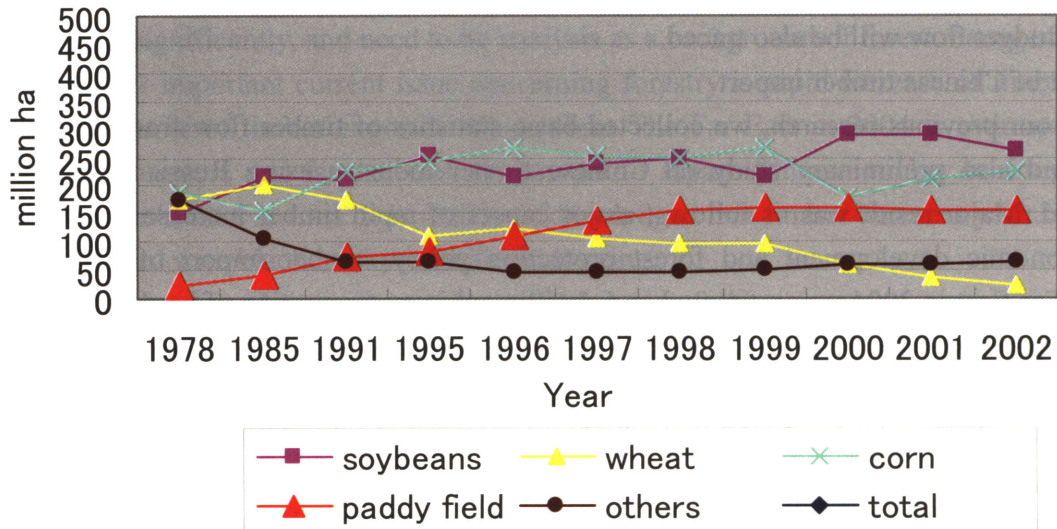


Fig 1 Area of fram land by crop in heilonjiang

In SanJiang Plain, state-owned farm (former state farm) is major developer of irrigation facilities. Different from household farmers, state-owned farm conduct systematic development of irrigation system and farming activities were carried out by contract management by former operator of farm machine under State farm. This farming structure makes it easy rapid farmland development.

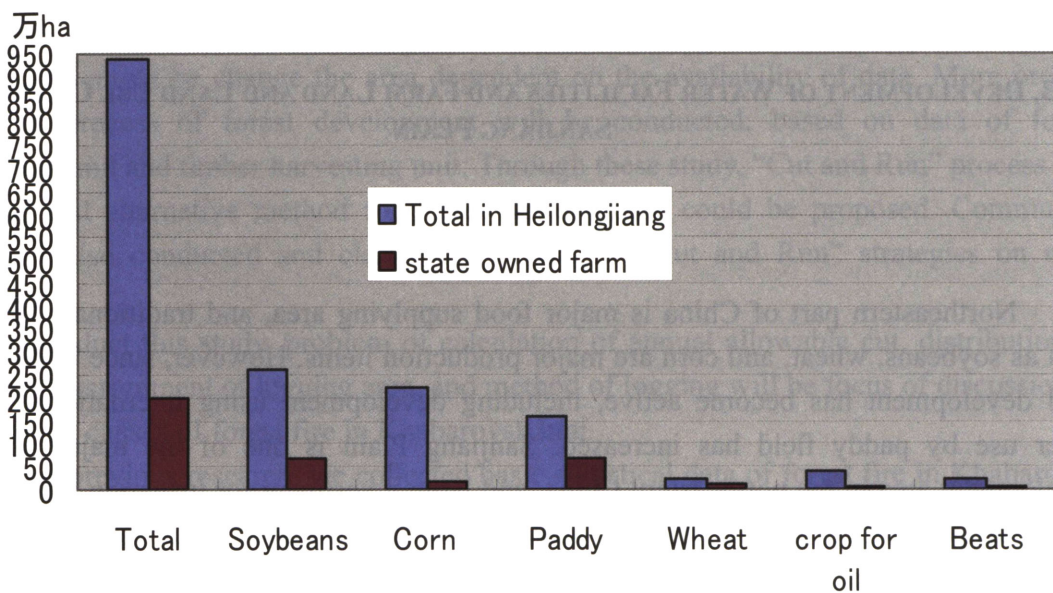


Fig 2 The role of Heilongjiang LRS



Sakashita and Park have involved in research of farm development in SanJiang plain more than 10 years. Major results of the study were as follows.

1) Process of water irrigation facility development

Investment to the well irrigation were carried out by individual farmers

2) Function of farm administration and production groups

Technical instruction, supply of production materials, Agricultural-products purchase, collection of a tax

3) The actual condition of individual farmers

Average size is about 10ha、mechanization has been developed for the upper class farmers、and management were stable until 2001.

4) Conditions after 2002

Price of rice was drop down in 2002 due to oversupply and farmers began to quit from rice production. Rice production fluctuate dependent on rice market

### **PURPOSE OF THE STUDY**

In this research, Sanjiang plain will be set as study area. Development of farmland and water facilities in these 100 years will be surveyed, and effect on formulation of farm community, management body, change on land use, economic development will be analyzed. Through these studies we will propose the development strategies of farm activities and also relation with nature environment.

### **METHODS**

Sanjiang plain is located northeastern part of Northeastern China, and because of dominance of wetland, farm development activities were far behind the other area. First farm development in Sanjiang plain was dated back to 1930's, by "Manchu development group" organized by "Manchu government". After the War, People's liberation Army organized back-to-farm-movement and established State farm in these areas. It could be said that farm development in Sanjiang Plain was systematic and latecomer.

Under this historical background, focus of the study will separate to historical analysis from 1900-1970's and Analysis of current situation from 1980's to the present.

1). Historical analysis

Historical analysis before the War will be conducted using material of South Manchuria Railway Company. Through statistical and qualitative analysis, development process of farmland and farm community will be studied out.

After the War, research will conduct based on the data of former state farm. Not only the development process of farm land but also economic effect of these developments will be analyzed.

2). Analysis of current situation

We already conducted case study in “XinHua Farm” near Jamus. We are planning to conduct another case study for different state owned farm.

**RESEARCH PLAN**

1). Historical analysis

Firstly, we will collect materials of South Manchuria Railway Company and organize database. Materials of the company are existed in various archives, but no systematic survey was conducted yet. Materials of individual state farm will also collect.

2). Analysis of current situation

Continue case study in “XinHua farm”. Collect data on state owned farms in Sanjiang Plan and organize database and select target state owned farm. For the targeted farms, development processes of farmland and water facilities will surveyed, and analyze their effect on rural community and economy.

**BRIEF SKETCH OF STATE OWNED FARM IN HEILONGJIANG PROVINCE**

Heilongjiang state owned farm is located in 50 cities and prefectures in the province. Total area is 5.4 million ha which consist 12.2% of farmland in the province. Headquarter of state owned farm are located in Halpin (moved from Jamus in 1998). Under the headquarter, there are nine branch office, and total number of state owned farm was 103.

In SanJiang Plain, there are four branch office and 54 state owned farms, and total area is 3.5 million ha. Major products are rice, soybeans and wheat.

Table 1 showed outline of LRS located in SanJiang Plain.

Table 1 The outline of LRS in SanJiang Plain (2003) (10,000ha  
10,000farmers)

Branch office	Cultivated Area	Grain Area	Rice	Soybean	Corn	Farmers
BaoQuanLing	28	26	7	10	5	5
HongxingLong	40	30	11	10	3	7
JianSanJiang	39	35	15	13	1	0.4
MuDanJiang	30	27	17	5	1	3
Total (A)	137	118	50	38	10	15.4
LRS (B)	203	169	55	66	15	27
A/B	67	70	91	58	67	57

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