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# **Motivation and Influence of FSC Forest Management Certification in China**

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**FSC China Office**

**Research Institute of Forestry Policy and  
Information, Chinese Academy of Forestry**

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# Motivation and Influence of FSC Forest Management Certification in China

## 1. Introduction

### 1.1 Research Background and Objectives

Forest Stewardship Council (FSC) certification of forest management entities and processing and trade enterprises has been developed in China for 20 years. While the international community and consumers increasingly concern about the sustainability of forest products, FSC certification is growing faster and faster in China. What is the motivation for Chinese forest management enterprises to carry out FSC forest management certification? What's the influence of FSC in China? This study is mainly to investigate, analyze and evaluate the motivation and influence of Chinese enterprises to carry out FSC forest management certification, analyze existing problems and influential factors and put forward suggestions for the development of FSC certification, so as to better play its roles in sustainable forest management in China.

### 1.2 Research Methods

This study combines qualitative analysis with quantitative analysis, general analysis with typical analysis, and normative analysis with empirical analysis. Through analyzing NC (non compliance) in the audit report prepared by the certification authority, questionnaire survey, interview with stakeholders, field investigation and other comprehensive evaluation methods, this study has broken the limitation of single evaluation method and tried to be objective, fair and comprehensive. Specific research methods include:

#### 1.2.1 Analysis of NC (Non Compliance) in the audit report prepared by the certification authority

The certification authority will issue "NC (Non Compliance)" for issues not meeting the requirements of FSC certification when conducting main assessment and annual audit of the forest management entities. Such information can be obtained from the audit reports for 80 Chinese forest management entities prepared by the certification authority disclosed on the website of FSC. The forest management entities shall correct NC within a certain period of time; otherwise, their certificate will be suspended or revoked. Therefore, business enterprises shall keep improvement after being certified.

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Such information can account for the impact of FSC on certified forest management, but cannot assess the efforts and changes made by forest operators during the preparation of certification. This study was made based on both Principles<sup>1</sup> and Criteria for statistical characteristics of NC and the differences in the determination of NC by different certification bodies. Besides, this study also analyzed the best practice cases proposed in audit reports issued by certification bodies and identify possible problems to lay the foundation for further field research.

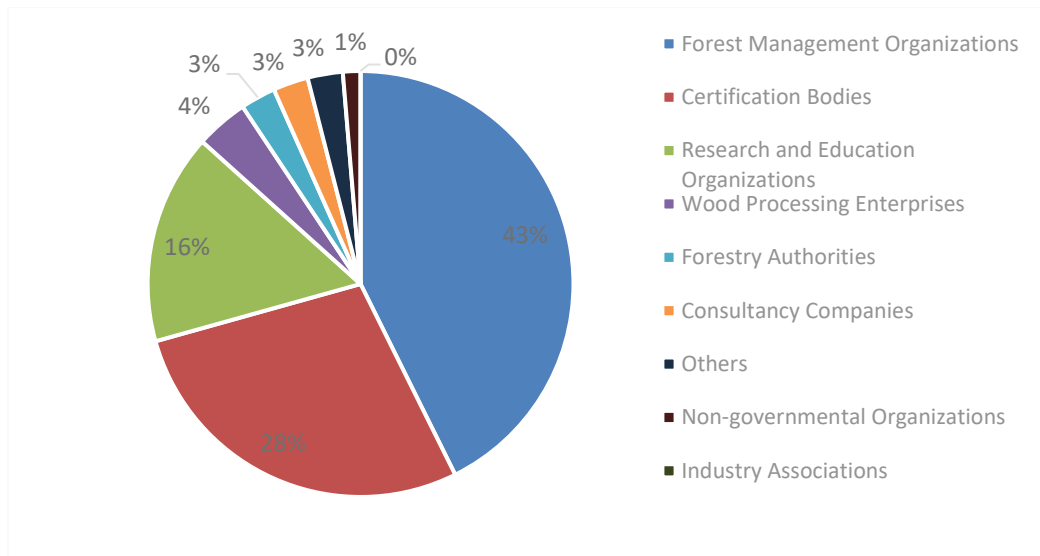
### **1.2.2 Questionnaire survey**

The questionnaires have been issued to FSC forest management certification objects and shareholders via email, network and field distribution, including forest management entities, certification bodies, processing enterprises, scientific research and education institutions, the competent forestry authorities, non-governmental organizations, industry associations, consultancy bodies. Questions include the motivation, influence and problems of forest management certification, associated challenges, etc. A number of indexes were designed for each question. The interested parties were asked to rate the importance or impact on a scale of 1 to 5, 1 for “unimportant or no influence” and 5 for “very important or greatly influential”. The forest management entities should also complete their profile, the sale of certified timber and the cost and benefit for them to carry out forest management certification, etc.

A total of 75 questionnaires were collected from the survey with the composition as shown in Figure 1 below. The survey made quantified analysis of the overall evaluation of the influence or importance of each index by various parties, and analyzed the differences in the views of forest managers and other stakeholders.

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<sup>1</sup> FSC2000 forest management criteria contains 10 principles under which there are 56 criteria. Each criteria contains a number of indexes. The certification bodies shall audit based on various indexes and propose NC if any on this basis.



**Figure 1 Proportion of Stakeholders for Questionnaire Survey**

### **1.2.3 Interviews with important stakeholders**

In this study, several key stakeholders of FSC certification in China were selected for interviews, including representatives of certified forest management enterprises, non-governmental organizations, certification bodies and scientific research institutions, so as to gain insight into the views of various stakeholders on the impact and benefits of forest certification. Such views were elaborated in details with relevant examples provided where possible.

### **1.2.4 Field survey and case study**

According to the different forest types, different certification bodies and forest rights and different certification modes, representative forest management entities were selected for field survey. The field survey focuses on collecting evidence and interview on actual impact on the enterprises and the analysis and contrast before and after certification, as well as the collection and collocation on actual cases about the influence of FSC certification, including the best practice and main problems. Toroyal Zhenghe Wood Industry Co., Ltd., Guangxi Sunway Forest Products Industry Co., Ltd., Guangdong Weihua Fengchan Forest Development Co., Ltd. and others for case study.

Besides, the author has participated in the entire process of a lot of forestry enterprises from early stage preparation for certification to annual audit after certification, and has accumulated a large amount of data and information on forest management entities from certification preparation to achievements. The author intends to make comparative analysis for forest management entities before and after certification.

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## **2. Status of FSC Certification in China**

Upon demands of the international market, Chinese forestry enterprises and processing enterprises mainly seek the certification of FSC as an international system, and some processing enterprises also make PEFC certification. Besides, China's national forest certification system has also been established and put into operation.

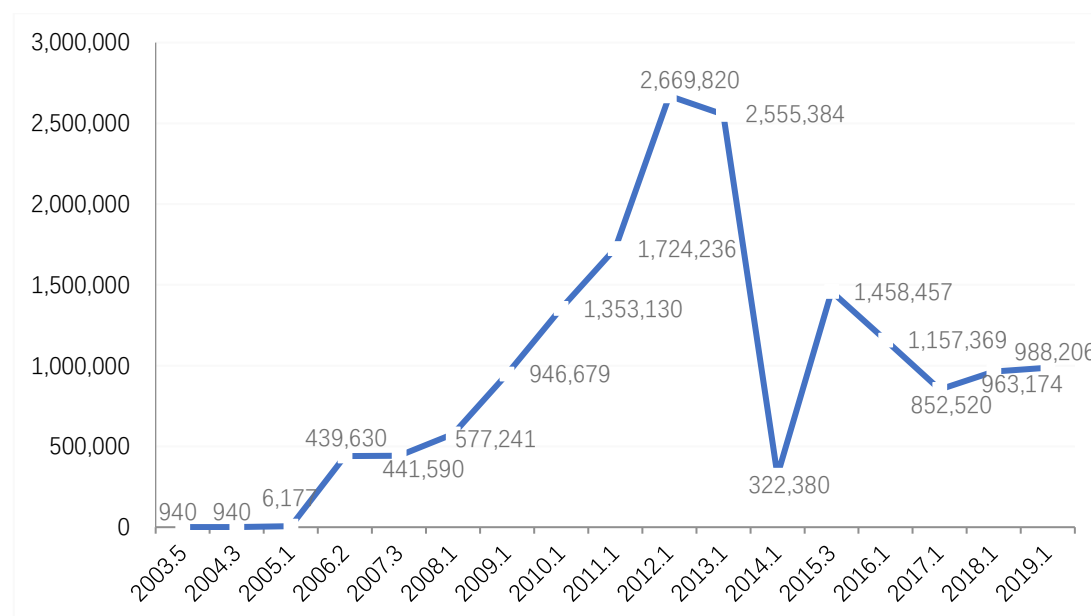
### **2.1 Forest Management Certification**

According to data on official website of FSC, as of January 3, 2019, 988,200 hectares of forest in the Chinese mainland managed by 80 forest management units had been certified by the international system FSC, ranking third in Asia behind Indonesia and Turkey, and ranking the 26<sup>th</sup> place in the world. Besides, 1437 hectares of forest managed by 3 forest management units in Taiwan had also been certified by FSC. The increase and decrease of FSC certified area is shown in Figure 2, from which it can be seen that the FSC certified area in China showed a trend of rapid growth from 2003 to 2012, and rapidly declined from 2012 to 2014 due to the implementation of the natural forest protection project and the no-logging policy and then gradually recovered and slowly developed after 2016.

According to statistics of official FSC website at the end of 2018 on forest certification enterprises in China, from the perspective of the distribution of forest land ownership, the majority of FSC certified forest management units in China are state-owned forest land and collective forest land, accounting for 68% of the total certified area. 27% of certified forest management units only have collective forest land and 5% of certified forest management units only have state-owned forest (see Table 1 and Figure 3, judging from the total certified forest area, there were more forest management units with only collective forest land (49 units), second by units with both state-owned forest and collective forest (28 units), while fewer of them have only state-owned forest land (3 units) (see Figure 4). This indicates that collective forests have become the main part for FSC certification in China. The certification of collective forests was mainly carried out by forestry companies, associations, cooperatives, forest farms and farmers, while the certification of state-owned forests was mainly carried out by state-owned forest farms. One of the main reasons is that The first reason is that the natural forest is mostly managed by the state forestry bureau and the state forestry farm. Due to the implementation of the state natural forest protection project, commercial cutting of natural forest has been stopped. Second, China has been promoting the reform of state-owned forest



farms. Main functions of state-owned forest farms have been clearly defined as protecting and cultivating forest resources and safeguarding national ecological security. Many state-owned forest farms have been restructured into public welfare forest farms.

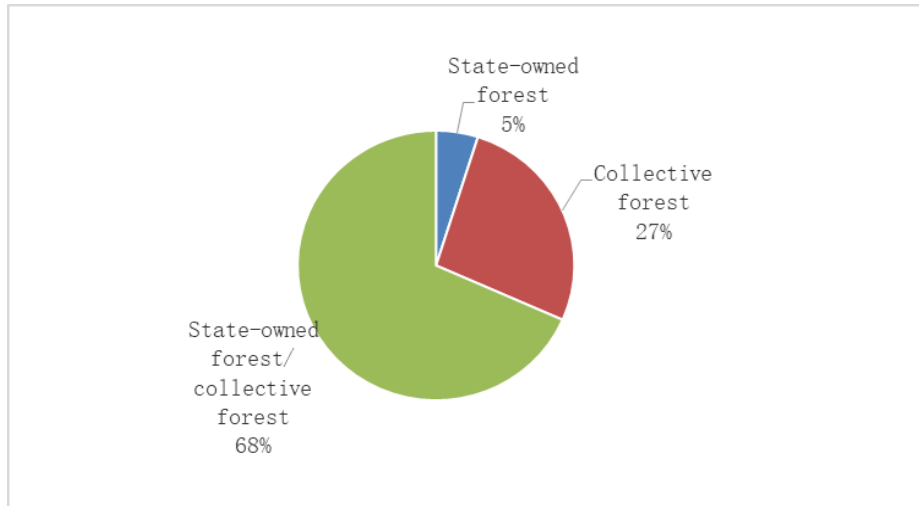


Note: excluding Hong Kong, Macao and Taiwan, the same below.

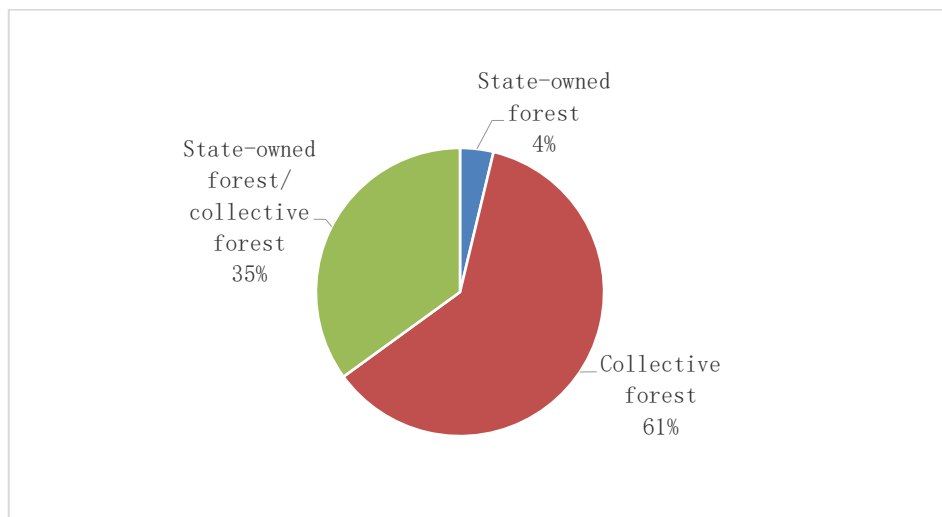
**Figure 2 FSC Certified Area Graphs in Chinese Mainland in 2003-2019**

**Table 1 FSC Certified Area and Quantity by Forest Land Ownership in Chinese Mainland**

Forest Land Ownership	Area (1,000 hectares)	Quantity
State-owned forest	48.2	3
Collective forest	262.6	49
State-owned forest/ collective forest	672.9	28
<b>Total</b>	<b>983.7</b>	<b>80</b>



**Figure 3 FSC Certified Area Distribution in Chinese Mainland by Forest Land Ownership**

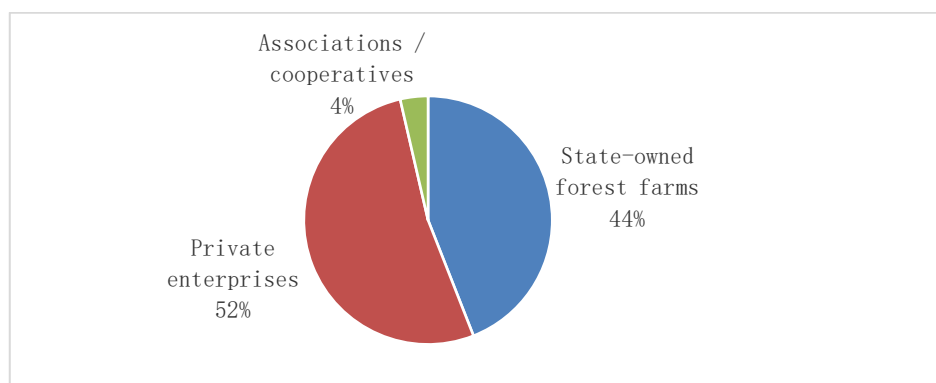


**Figure 4 FSC Certified Quantity Distribution in Chinese Mainland by Forest Land Ownership**

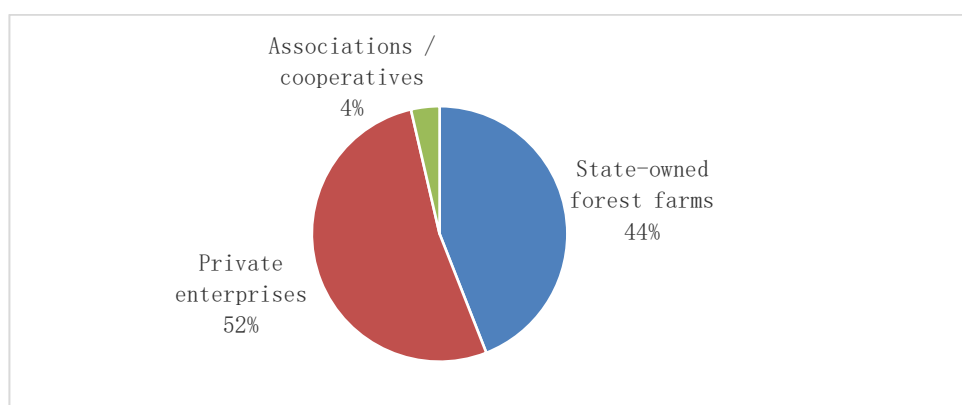
Judging from the management entities, private enterprises have the largest certified area in Chinese mainland which accounts for 52% of the total certified area. The certified area of state-owned forest farms accounts for 44% and that of associations/ cooperatives accounts for 4%. In terms of the certified quantity, there are 60 private forest management companies, 15 state-owned forest companies and 5 associations or cooperatives (see Figure 2, Figure 5 and Figure 6).

**Table 2 FSC Certification Area and Quantity of Different Management Entities in Chinese Mainland**

Management Entity	Area (1,000 hectares)	Quantity
State-owned forest farms	433.2	15
Private enterprises	515.0	60
Associations / cooperatives	35.5	5
<b>Total</b>	<b>983.7</b>	<b>80</b>



**Figure 5 FSC Certified Area Distribution of Different Management Entities in Chinese Mainland**



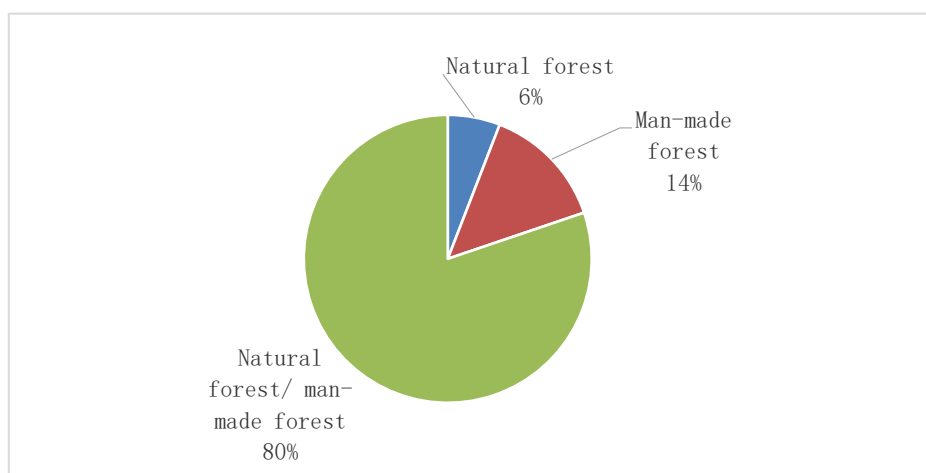
**Figure 6 FSC Certified Quantity Distribution of Different Management Entities in Chinese Mainland**

Based on the distribution of forest type, there are 7 forest management units with mainly natural forest in China. They have 57,900hm<sup>2</sup> of certified area,

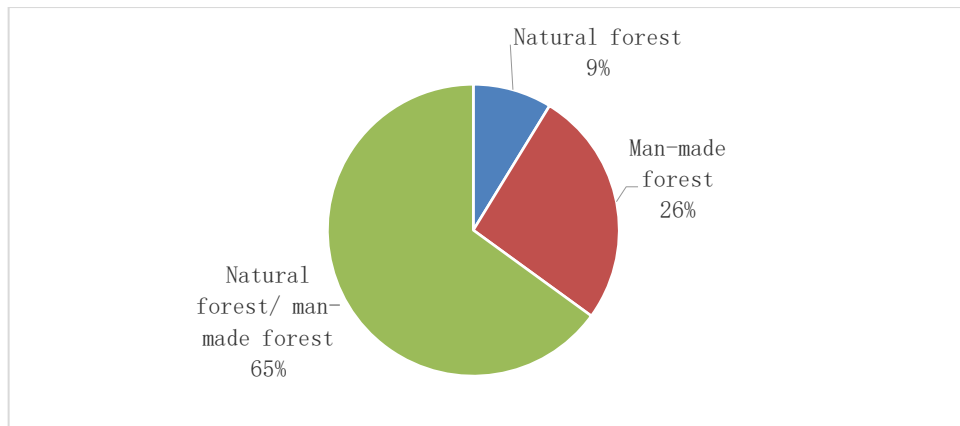
accounting for 6% of the total certified area. There are 21 forest management units with mainly man-made forest. They have 136,900 hm<sup>2</sup> of certified area, accounting for 14% of the total certified area. Most of forest management units have both natural forest and man-made forest. They have 788,900hm<sup>2</sup> of certified area, accounting for 80% of the total certified area (see Table 3, Figure 7 and Figure 8).

**Table 3 FSC Certified Area and Quantity of Different Forest Types in Chinese Mainland**

Forest Type	Area (10,000 hectares)	Quantity
Natural forest	5.79	7
Plantation	13.69	21
Natural forest/ Plantation	78.89	52
<b>Total</b>	<b>98.37</b>	<b>57</b>



**Figure 7 FSC Certified Area Distribution of Different Forest Types in Chinese Mainland**

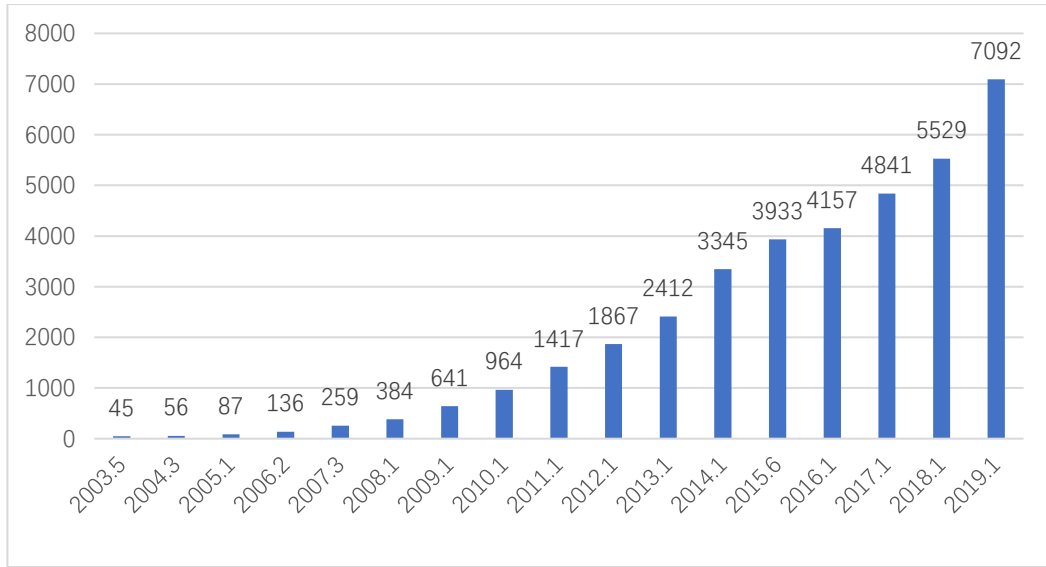


**Figure 8 FSC Certified Quantity Distribution of Different Forest Types in Chinese Mainland**

Based on the development trend of FSC certification in China, FSC forest management certification area and quantity will increase continuously due to the continuous growth of the international market demand and the chain of custody certification for Chinese processing enterprises, which will drive the increase of enterprises' demand for certified timber. Plantations of industrial raw materials in southern China will be the main part for certification, while the certification area of natural forests will be relatively small due to the restriction of national policies.

## **2.2 Chain of custody(CoC) Certification for Forest Products**

By the end of December 2018, Chinese enterprises had obtained a total of 7,869 FSC CoC certificates, including 7,092 for the Chinese mainland, 517 for Hong Kong, 259 for Taiwan and 1 for Macao, accounting for 21.8% of the total number of FSC CoC certificates, ranking the first in the world with a very fast development rate (as shown in Figure 9). Most of these enterprises are export-oriented processing enterprises and domestic suppliers, distributed in economically developed Hong Kong, Guangdong, Fujian, Shandong, Zhejiang and other places.

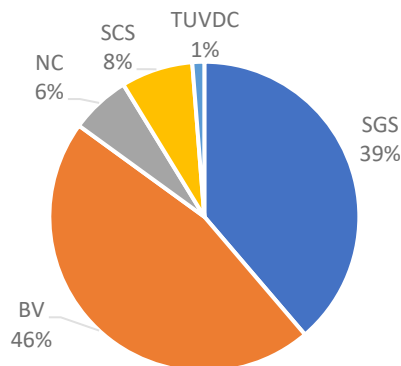


Note: excluding Hong Kong and Taiwan region.

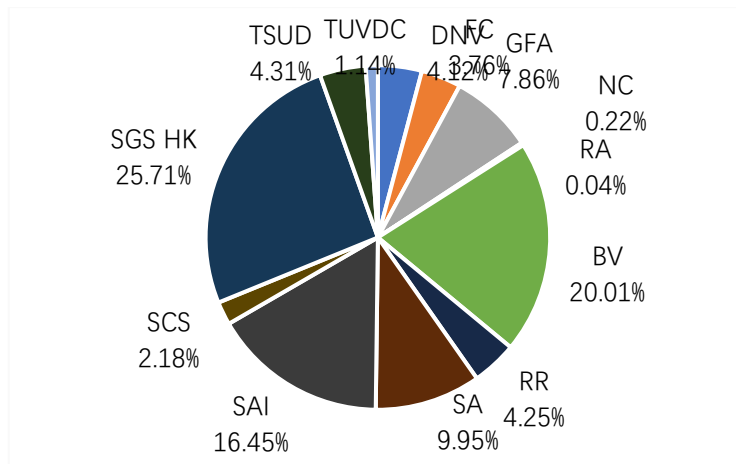
**Figure 9 FSC CoC Certified Enterprise Growth in Chinese Mainland**

### 2.3 Certification Organizations

Currently, FSC certification in China is conducted by international certification organizations recognized by FSC or their Chinese partners. No domestic certification body in China has been recognized by FSC. The certification organizations for the 80 FSC certified forest management units are SGS (certifying 31 units, the same below), BV (37 units), NC (5 units), SCS (6 units) and TUVDC (1 unit). The 7428 CoC certificates were respectively issued by the following 13 organizations: DNV (306), FC (279), the GFA (584), NC (16), RA (3), BV (1486), RR (316), SA (739), SAI (1222), SCS (162) and SGS HK (1910), TSUD (320) and TUVDC (85) (see the specific distribution as shown in Figure 10 and Figure 11).



**Figure 10 Distribution of Forest Management Certification Quantity of FSC Certification Organizations in Chinese Mainland**



**Figure 11 Distribution of CoC Quantity of FSC Certification Organizations in Chinese Mainland**

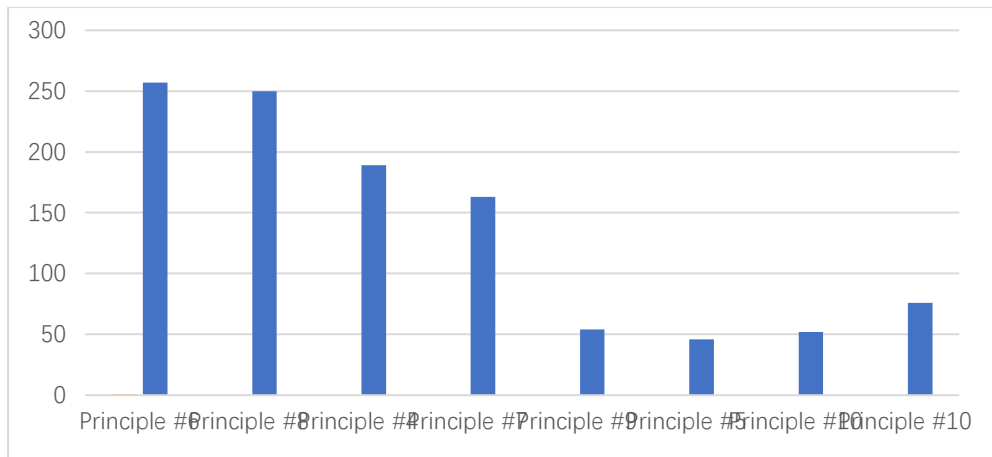
### **3. “Non Compliance (NC)” Analysis for FSC Certified Forest Management Units in China**

This study collected 191 audit report summaries of 80 FSC certified forest management units in the Chinese mainland by the end of 2018 from the official website of FSC (<https://ic.fsc.org>), involving 1,117 NC items based on FSC forest management criteria. The purpose is to summarize the management status of China’s certified forest management units in China and the gap with FSC criteria. Forest management units should correct NC items within a certain period of time; otherwise, the certificate will be suspended or revoked. So, NC items can reflect the impact of FSC criteria on forest management units after certification. Since the newly issued FSC China criteria was not officially implemented until the second half of 2018, the certification was still based on indexes developed by each certification organization under the old FSC principles and criteria. This study is also made based on the old FSC principles and criteria.

#### **3.1 NC Content Analysis**

##### **3.1.1 Statistic analysis of non compliance with principles**

These NCs were issued based on indexes. Non compliances with indexes under the 10 principles were totaled respectively to get to number of NCs under each of the 10 principles, and then, they were ranked from most to least (see Figure 12).



**Figure 12 Statistics of NCs with Principles for FSC Forest Management Certification in China**

According to this figure, since the implementation of FSC forest management certification in the Chinese mainland, the gaps between the certified forest management units and the certification criteria have been counted based on the principles and are listed below from most to least:

**Principle #6: Environmental impact.** Among the 80 investigated enterprises, 257 NCs with Principle #6 have been found. This is the biggest challenge for Chinese forestry enterprises. Almost all certified enterprises have NCs. China's forestry regulations and criteria have included environmental requirements, but they are not perfect, and forest managers generally pay little attention to them in terms of both concept and practice. In actual production, enterprises seldom consider the impact on the natural environment or their consideration is not enough. Forestry enterprises seldom have professionals in special department to take charge of relevant affairs. Some enterprises believe that nature protection, such as wildlife protection and ecosystem protection, is the affair of the government. In addition, some requirements of FSC criteria are also different from traditional Chinese business philosophy. For example, China encourages the introduction of foreign tree species, but FSC requires careful control and active monitoring of the use of foreign species. Foreign tree species will not be introduced until it is ensured that no negative ecological impact will be caused. Besides, there are some FSC requirements not implemented in China for forest management, such as the requirement for the environmental impact assessment.

**Principle #8: Monitoring and assessment.** Among the 80 investigated enterprises, 250 NCs with Principle #8 have been found. China has a relatively sound forest resources monitoring system, including national forest resource class one inventory and class two inventory, and the class three inventory inside



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forestry enterprises. There is also a relatively sound forest fire and pest control monitoring system, but there is still a big gap between China and FSC criteria for wildlife monitoring, the monitoring of the environment for forest management activities and the social impacts and CoC monitoring for forest management.

Principle #4: Community relations and worker's rights. Among the 80 investigated enterprises, 189 NCs with Principle #4 have been found. This is also a weak link for forest management in China. Forest operators in China have not yet paid much attention to it. Many forest operators still believe that it is an internal matter of the enterprise for how to operate in their own forestlands, which is not related to the surrounding community. Moreover, national laws and regulations mainly protect the legal rights of forests and forestlands, but do not support the protection of customary rights. Some operators think that enterprises should not take the social responsibility that the government should take. Therefore, in practice, the protection of the rights of local communities, the establishment of communication mechanism with local communities and the implementation of social impact assessment are not enough. In addition, Chinese forestry enterprises should further improve health and safety of their employees. In particular, there is a big gap between the safety production equipment of workers and FSC requirements. Insurance, health and other benefits and safety protection should also be strengthened for outsourcing workers.

Principle #7: Management plan. Among the 80 investigated enterprises, 163 NCs with Principle #7 have been found. In the Forest Law of the People's Republic of China, there are mandatory requirements for forestry enterprises to formulate forest management plans, but the implementation effect varies. Enterprises generally have not established an effective regulatory mechanism. Besides, the implementation of forest management plans is often affected by changes in national forestry policies. However, the state forestry administration has issued the outline of China's forest management plans and has carried out a series of pilot work, which is basically consistent with FSC certification requirements, which lays a very good foundation for China to carry out certification and sustainable operation.

Principle #1: Compliance with laws and FSC Principles. Among the 80 investigated enterprises, 76 NCs with Principle #1 have been found. It is the basic principle that Chinese forestry enterprises must abide by national laws and regulations. On the whole, enterprises can meet the requirements of this principle. Certification organizations found during audit that some forestry enterprises failed to understand and implement laws and regulations properly

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so that they proposed NCs against them. Forest management enterprises also face other problems, such as how to combine compliance with international conventions signed by countries with enterprises' production practices, and how to deal with conflicts between certification criteria and national laws and regulations. For example, relevant provisions of the state require to clear away dead standing trees and ill and rotten wood in the forest, but FSC requires to reserve certain quantity of rotten wood.

Principle #9: Maintenance of high conservation value forests. Among the 80 investigated enterprises, 54 NCs with Principle #9 have been found. China implements a classified management system and carries out the judgment and management of ecological public forests, which has laid a good foundation for the assessment and management of high-conservation value forests. Although the two concepts have different requirements in judging principles, methods and processes, most of the standards are consistent. The outline of the new forest management plan issued by the state forestry administration also explicitly requires forest management units to protect forests of high conservation value. In actual operation practice, forestry enterprises fail to have accurate understanding of some concepts and do not know the proper way for judgment, protection, management and monitoring.

Principle #10: Plantations. Among the 80 investigated enterprises, 52 NCs with Principle #10 have been found. The definition of FSC for plantation is somewhat different from the general concept in China. It refers to the stand that lacks typical features of a local ecosystem, rather than a stand of artificial origin. In practice, different auditors, certification bodies and relevant parties have different understanding of this. The main difference in plantation management lies in how to plan a certain area of woodland to be transformed into natural forest, and how to ensure the diversity of plantation species and the stability of plantation structure and function. It is also a hot discussion top for how to define the transformation of natural forest into plantation.

Principle #5: Benefits from the forest. Among the 80 investigated enterprises, 46 NCs with Principle #5 have been found. In general, Principle #5 is consistent with the traditional concepts of forest management in China, such as economic feasibility, diversified operation, waste reduction, increase of added value of products, sustainable production of timber and forest products, and improvement of service value of forests. The main gap lies in how to ensure the input of management in environmental protection, analyze the economic feasibility of forest management, and reduce the waste of resources and environmental damage in forest management activities. In addition, there is still

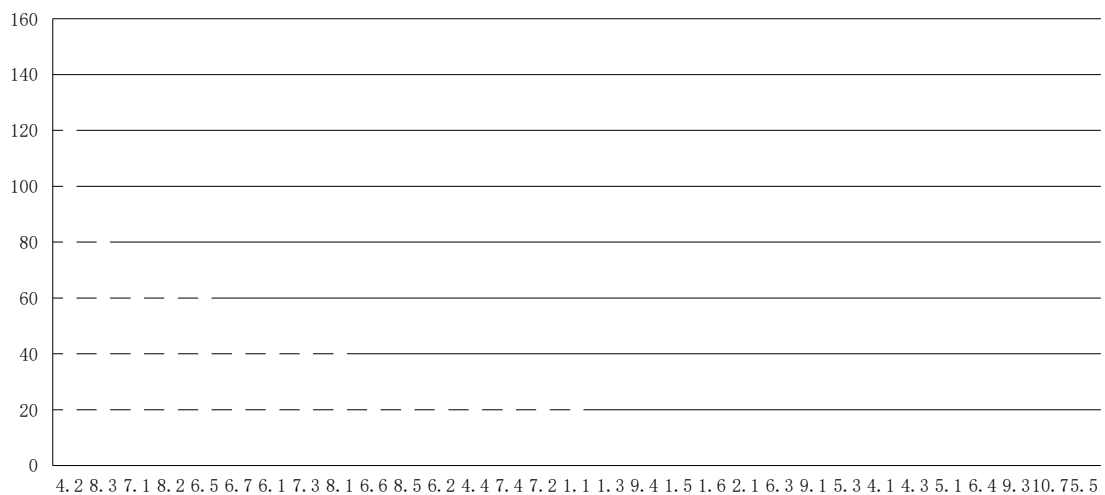
a certain gap for how to ensure the sustainable use of non-wood forest products.

**Principle #2: Tenure and use rights and responsibilities.** Among the 80 investigated enterprises, 28 NCs with Principle #2 have been found. China has a relatively complete system of forest rights, and the ongoing reform of forest rights has created a good premise for the development of certification. What needs to be paid attention to is the principle of fairness, justice and voluntariness in the process of forest right transfer, as well as the handling mechanism of forest right disputes.

**Principle #3: Indigenous peoples' rights.** Among the 80 investigated enterprises, 2 NCs with Principle #3 have been found. Chinese indigenous people are generally understood by FSC to be indigenous minorities. Minorities exist only in a few of forests in China, and their rights are not very different from those of the Han people in general.

### 3.1.2 Statistic analysis of non compliance with criteria

Non compliances of the 80 certified forest management units based on FSC criteria have been recognized and ranked based on the number of appearance from most to least (only criteria with more than 10 NCs are listed). See Figure 13.



**Figure 13 Statistics of NCs of FSC Certified Chinese Forest Management Units Based on the FSC Criteria**

It can be seen in the figure that since the implementation of FSC forest management certification in the Chinese mainland, the gaps between the certified forest management units and the certification criteria have been counted based on the criteria and are listed below from most to least:

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Criteria #4.2: for employee safety and health, there are 98 NCs, such as no necessary tools, machines, equipment and devices at the workplace, including sound PPE (personal protective equipment), insufficient medical rescue provided against accidents occurred during operation, and insufficient safety training on forestry activities with outsources included.

Criteria #8.3: for CoC monitoring in forest management, there are 84 NCs, such as no FSC statement in proper format attached to the sales invoice or other documents related to sales certification; products placed at the transportation area, the stack area and the processing area failing to have documents of the place of origin and the destination; the company failing to keep logging records and detailed records on the use and sales of the certified timber, etc.

Criteria #7.1 For contents of the forest management plan, there are 61 NCs, mainly including the failure to describe forest resources and the logging amount of the planning year based on forest land type and the failure to meet requirements of regulations and official quota; inconsistency of partial forest resource statistical data or wrong information in the forest management plan; lack of necessary map to show features important for forest management, etc.

Criteria #8.2: For the contents and indicators for forest monitoring, there are 67 NCs, mainly including the failure to monitor after logging, the failure to evaluate waste disposal and damage to the logging place after cutting; the failure to provide effective soil monitoring records; the failure for the forest operators to monitor forest tree growth volume according to requirements; the failure to monitor the environmental and social impact during and after logging, etc.

Criteria #6.5: For soil and water protection, there are 62 NCs, mainly including the failure to establish the forest fire control system according to the Regulations on Forest Fire Prevention; the failure of operators to implement proper emergency procedure to clear away accidentally disclosed oil; the failure to reserve buffer zones on both sides of the riverway and around the water body; the failure for the buffer zone to comply with provisions of the national and regional best practice guidelines, etc.

Criteria #6.7: For the disposal of wastes, there are 45 NCs, including the enterprises abandoning contains and inorganic solid waste in the forest area; the owner/ operator failing to dispose not recyclable wastes in environmentally harmless way, including wastes generated by contractors working inside the forest management units; the discovery of package of chemicals abandoned at the site in the forest; no facilities provided at the operation site to facilitate garbage collection, etc.

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Criteria #6.1: For environmental impact assessment, there are 40 NCs, including the related person in charge not familiar with the environmental impact assessment procedures; the failure to consider possible environmental impact in the planning and operation; the failure to avoid or reduce negative impact.

Criteria #8.1: For the forest monitoring system, there are 41 NCs, mainly including that the company cannot provide monitoring records on logging and other activities, the consistent and reproducible monitoring procedures of each activities are not documented in the plan; such procedures are not implemented so that monitoring results of different stage cannot be compared; the monitoring frequency is not adaptive to the sensitivity of the monitored environment, etc.

Criteria #7.3: For the training and supervision of forestry workers, there are 41 NCs, mainly including that the management personnel have not been appropriate trained on the management plan, not all operation activities are sufficiently supervised to ensure sufficient implementation of the plan, policies, procedures and contracts (signed with the contractors), target trees for logging are not marked according to the operation guidelines during intermediate cutting, etc.

Criteria #6.6: For the pest management in the forest management system, there are 34 NCs, including that members fail to record the name and quantity of chemicals used in the assessment scope, the transportation, storage, handling, use and removal of chemical pesticides after accidental spills do not comply with the Safety and Health of Agricultural Chemicals - Guideline A issued by the International Labor Organization, and the Safety Knowledge for Chemical Use at Work, and that the company does not have the latest FSC List of High-Risk Pesticides, etc.

Criteria #8.5: For the summary and application of forest monitoring results, there are 36 NCs, mainly including that the monitoring results are inconsistent with the summary published and that the company fails to make public the summary of monitoring results, etc.

Criteria #6.2: For the protection of rare, threatened and endangered species, there are 30 NCs, mainly including that rare, threatened and endangered species appeared in the forest are not identified and documented by the forest management unit, the habitat boundaries of rare, threatened and endangered species are not marked on the map, rare, threatened and endangered species are not protected during operations of the forest management units, forest management units fail to cooperate with recognized experts and conservation

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organizations to identify rare, threatened and endangered species.

Criteria #4.4: For social impact assessment and stakeholder consultation, there are 26 NCs, mainly including that the company fails to periodically communicate with local communities, minorities and other stakeholders to assess the potential positive or negative social impacts of forest management activities; the communication with stakeholders on issues requiring action and further follow-up is not documented; the company fails to consult with stakeholders based on management scale and intensity; and that no notification documents for relevant parties on forest management activities, etc.

Criteria #7.4: For the public available of summary of the forest management planning, there are 26 NCs, mainly including that the latest summary of main contents of the company's management plan is not published, or the company fails to update the summary of the plan's main contents, the company fails to make public key points of its forest management plan to facilitate the stakeholders to make consultation, etc.

Criteria #7.2: For the revision of the forest management plan, there are 23 NCs, mainly including that there is no evidence that the latest scientific and technical progress and the monitoring results are not considered when revising the management plan and that no technically feasible and economically allowed modification/ adjustment schedule has been prepared for the management plan, etc.

Criteria #1.1: For the compliance of laws and regulations during forest management, there are 22 NCs, mainly including that the company does not collect the latest applicable national and local laws and regulations; the contractor's personnel are not familiar with the applicable legal and regulatory requirements; and that subordinating forest management units of the company fail to keep the texts of laws and regulations and operating procedures, etc.

Criteria #1.3: For the compliance with relevant terms of international conventions, there are 19 NCs, mainly including that forest operators do not know that relevant international conventions have been updated and that the company fails to collect all applicable ILO conventions, etc.

Criteria #9.4: For the monitoring of high-conservation value forests, there are 17 NCs, mainly including that the method to monitor the effectiveness of management measures to maintain HCVF features is incorrect; the monitoring indexes and frequency have not been determined to monitor the effectiveness of management and protection measures in the plan, and that the monitoring records are not used to consult with the recognized experts, local and national

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stakeholders.

Criteria #1.5: For avoiding illegal and other unauthorized activities, there are 15 NCs, mainly including that the forest manager fails to take effective measures to monitor, identify and control illegal logging, illegal settlements, and other unauthorized activities, etc.

Criteria #1.6: For the commitment to observe FSC criteria, there are 15 NCs, mainly including that FSC policies are not communicated throughout the forest farm, workers do not know that the company is carrying out forest certification work, and that the forest operators (members of the consortium) do not make commitment to comply with FSC principles and criteria for long term for forests under their management even if they are not within the certification scope, etc.

Criteria #6.3: For the maintenance, enhancement or restoration of ecological function and value, there are 15 NCs, mainly including that there is no plan for the restoration of degraded land for borrow pits in the forest in order to main ecological function; the use of chemical fertilizers is not minimized; there is no plan for the restoration of degraded land; the buffer zones reserved on both sides of the riverway and around the water body do not comply with provisions of the national and local best practice guidelines, etc.

Criteria #2.1: For the long-term use right of land and forest resources, there are 14 NCs, mainly including that the forest boundary is unclear, the clear boundaries of the forest management units within the certification scope cannot be provided and marked on the map, the forest doest not have a clear paper map to describe the certified forest of the forest farm, the joint certification entity fails to reserve copies of all forest ownership certificates, etc.

Criteria #9.1: For the assessment of high conservation value forests, there are 14 NCs, mainly including that the company just consulted a few of stakeholders for high conservation value forest assessment (mainly including forestry authorities, governments and non-governmental organizations) and failed to consult local communities, the joint entity failed to identify the fifth type of high conservation value forests through the participation of local communities, etc.

Criteria #5.3: For minimizing the waste from logging and processing, thee are 13 NCs, mainly including that the logging operation is not implemented according to the national best operation guidelines, and the company fails to minimize the waste of wood, etc.

Criteria #4.1: In terms of opportunities for employment and other services in the local community, there are 12 NCs, mainly including non-compliance with

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legal requirements on the minimum age of logging workers, no training records on tending workers and no support provided for infrastructure, etc.

Criteria #4.3: In terms of protecting employees' rights to establish organizations and negotiation, there are 12 NCs, mainly including that the company does not have any system to support employees to voluntarily join the trade union and the workers' congress or related rules and systems to protect women's rights and interests and collective bargaining, the company fails to meet the requirements of the international labor organization and China; it is proven by the deputy general manager through interview that business decisions were made by the deputy general manager based on the trend and requirements of the timber market without consultation with and participation of forest workers, and there is no effective mechanism to provide information and involve workers into decision-making directly affecting their work conditions, etc.

Criteria #6.4: For representative ecosystem protection, there are 12 NCs, mainly including that the boundaries are not marked for all areas that should be protected on the map.

Criteria #5.1: For economic viability and necessary investment of forest management units to maintain the ecosystem productivity, there are 12 NCs, mainly including that description on environmental and social costs are not included in "investment estimate and benefit analysis" in the company's business plan, the forest management plan describes the budget of forest management, but does not provide accounting records on cost and benefit, and that the benefit of investment and forest management is not indicated in the accounting book, etc.

Criteria #9.3: For specific measures to maintain and enhance adaptive protection characteristics of high conservation value, there are 12 NCs, mainly including that the company failed to make public the high conservation value forest judgment results and its protective measures, the measures made public for the management of high conservation value forest are not the latest version, etc.

Criteria #10.7: For the reduction of incidence of pests, fires and invasive species, there are 12 NCs, mainly including that there is no documented strategies for the management of pests and invasive plants so as to minimize the usage of week killers and reduce damage to the environment and a small area of fire use was found on the cutover land.

Criteria #5.5: For the confirmation and maintenance of the value of forest



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services and resources, there are 11 NCs, mainly including that the members fails to indicate in the management document (such as the map) the places (type/ distance) requiring to establish the buffer zones/ riparian zone around or along the coast, such as areas around or banks of water bodies, streams, springs and lakes/ ponds, etc.

Criteria #9.2: For consultation on the confirmation of protective characteristics and the method to maintain such characteristics, there are 11 NCs, mainly including that the company does not have design documents on the management of the high conservation value forests, the company failed to save records on high conservation value forest assessment and consultation, the company cannot provide records on consultation with stakeholders when determining measures for the management and maintenance of high conservation value forests, etc.

In addition to criteria on forest management certification, there are also NCs with criteria proposed by the certification organizations on the use of FSC trademarks, mainly including that the auditor found on the advertising page of the company that the company used FSC trademark (FSC in capital letters) without applying from the certification company and obtaining approval in advance; “FSC” was used on the name card of the management representative of the joint entity, the logo or mark was wrongly used together with the user’s own brand, thus resulting in the misunderstanding of brand cooperation or FSC label overlapping, etc.

NCs with criteria for joint FSC certification mainly include that the company cannot provide procedure documents related to the certification, there is no specific and documented division of responsibilities between the company and member companies, and not all members can understand the joint certification procedure and use the criteria, the procedure documents formulated by the joint entity on qualification of joint members do not contain the procedure for dispute settlement, the CoC established by the joint entity cannot fully realize tracking of forest products produced by members and sold as FSC certified products, etc.

## **3.2 NC Difference Analysis**

### **3.2.1 NC difference analysis of different audit types**

Based on different audit types, this study made statistics for NCs of the 80 certified forest management units by classification based on FSC principles. See NC numbers and frequency of main audit and annual audit as shown in Figure 14. There were 74 NCs found by main audit and 192 NCs found by annual audit.

Based on the figure, the distribution of NCs with various principles found by main audit and annual audit is basically consistent. Relatively speaking, more NCs with Principle #6 Environmental impact, Principle #1 Compliance with national laws and regulations and FSC principles were found during main audit, while more NCs with Principle #8 Forest monitoring and assessment, Principle #4 Community relations and worker's rights and Principle #10 Plantation were found during annual audit. The average NC number found by main audit is 7.2 which is 3.0 for annual audit. This is consistent with the general audit rules. It is indicated that the majority of NCs have been gradually corrected after main audit.

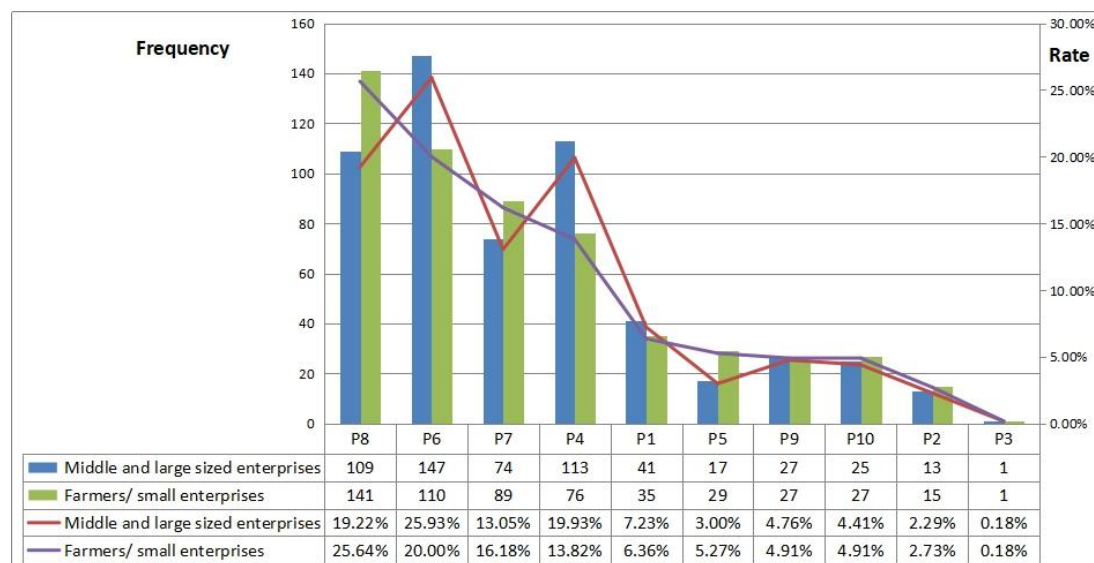


**Figure 14 NC Statistics for FSC Forest Management Certification in China by Different Audit Types**

### 3.2.2 NC difference analysis of enterprises of difference scales

According to different enterprise scale, statistics by classification have been made for NCs of the 80 certified forest management units based on the FSC principles. 45 companies or farmers (for joint certification) with the forest area less than 500 hectares are classified as farmers/ small enterprises. The left 35 units are classified as middle and large sized enterprises. Their NC numbers and frequency are shown in Figure 15. According to this figure, the distribution of NCs with different principles is basically consistent for different sales of enterprises. Relatively speaking, the NC frequency is higher for middle and large sized enterprises with Principle #6 Environmental impact, Principle #4 Community relations and worker's rights, Principle #1 Compliance with national laws and regulations and FSC principles; the NC frequency is higher for farers and small sized enterprises with Principle #8 Forest monitoring and assessment, Principle #7: Forest management plan and

Principle #5: Benefits from the forest. Large and middle sized enterprises were audited by 127 times in total and the average number of NCs found by each time of audit was 4.5; farmers and small sized enterprises were audited by 139 times in total and the average number of NCs found by each time of audit was 4.0. This indicates that there is no obvious difference for the number of NCs for enterprises in different scales. Large and middle sized enterprises have slightly more NCs. The reason may be that some of farmers or middle and small sized enterprises adopted small sale low-intensity certification criteria of which the requirements were relatively lower.

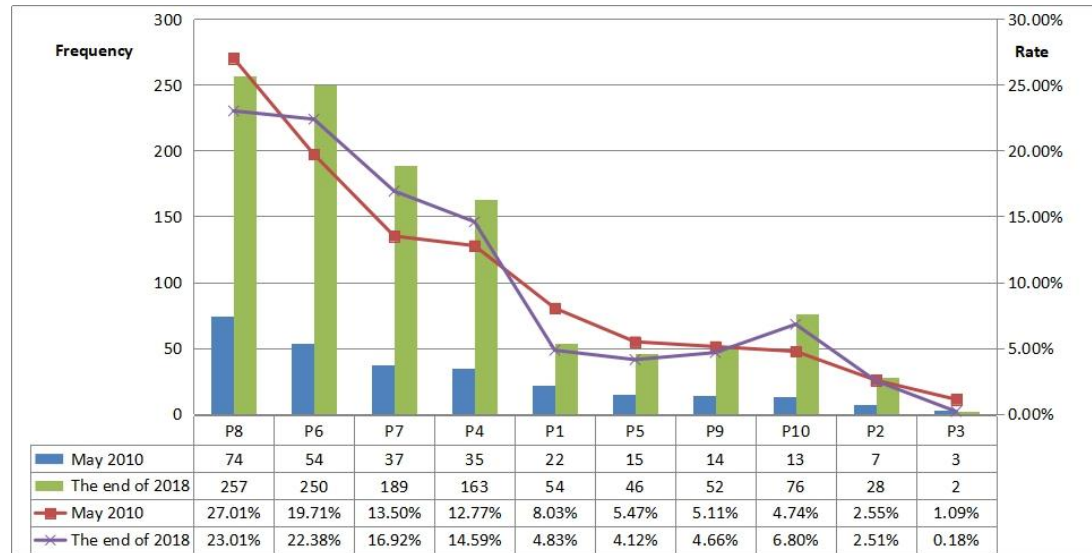


**Figure 15 NC Statistics for FSC Forest Management Certification in China by Different Enterprise Scales**

### 3.2.3 NC difference analysis by different time

From the time dimension, statistical analysis has been made for NCs for forest management enterprises certified in May 2010 and at the end of 2018 (data of 2010 was sourced from the paper of Dr. Xu Bin “Study on the Impact of Forest Certification on Sustainable Management of Forest” with some data overlapped). The NC numbers and frequency of the two periods are shown in Figure 16. According to this figure, the NC frequency distribution of in the two periods is basically consistent. Relatively speaking, the NC frequency is higher in 2018 with Principle #6 Environmental impact, Principle #7: Forest management plan, Principle #4: Community relations and worker’s rights and Principle #10 Plantation; the NC frequency is higher in 2010 with Principle #8 Forest monitoring and assessment, Principle #1 Compliance with national laws and regulations and FSC principles and Principle #5: Benefits from the forest. In 2010, the average number of NCs found by each time is 13.7 while this figure in 2018 is 4.2, down by 69%. On the one hand, the NC quantity reduced in 2018 because

many enterprises have been audited by many times. On the other hand, as time went on and China's accumulation of experience in FSC forest certification, forestry enterprises and technical consultation organizations were more familiar with certification criteria and got more sufficient preparation so that their conformity with FSC criteria had been greatly improved.



**Figure 16 NC Statistics for FSC Forest Management Certification in China by Different Periods of Time**

#### **4. Motivation and Willing of Chinese Enterprises to Carry Out FSC Forest Management Certification**

According to the nationwide questionnaire survey of stakeholders, all participants were divided into the forest management units and other stakeholders (including the certification organizations, processing enterprises, scientific research and education institutions, competent forest authorities, non-governmental organizations and consulting institutions). Stata15 was applied for difference examination for opinions of forest operators and other stakeholders. All indexes were scored based on base value of 3.5. If the score of the index is higher than 3.5, it means that the role or impact of the index is significant, and vice versa.

The frequency, average and difference of different stakeholders on the driving power of forestry enterprises to carry out forest management certification are demonstrated in Table 4 below. The overall average score for the motivation is 3.43, which indicates that these factors or motivations are generally important for promoting forest certification in China. The average score given by forest management units was 3.71 and the average score given by other stakeholders

was 3.22, showing significant difference. This suggests that these motivations are more important for forest management units who expected higher returns from certification, or stakeholders were likely to underestimate the impact of these factors on certification. To be specific, forest management units gave a higher score for the following driving factors, including fulfilling corporate social responsibility, building harmonious community relations, improving corporate image, establishing industry brand, protecting the environment and biodiversity, and improving the power of business management. In addition to direct market benefits, companies also concerned about non-market benefits such as corporate social responsibility and the role of certification in improving forest management. The pressure or support of domestic non-governmental organizations was not as important to enterprises as the understanding of stakeholders. There is no significant difference between the two for other motivations.

More intuitively, the ranking of average of the forest management unit's motivation to carry out forest management certification is reflected by the line chart below (see Figure 17). The results of the questionnaire show that forest management units and certification stakeholders believe that the main motivations of certification are direct market benefits and the improvement of enterprise management level, while indirect market benefits and the support and promotion from external organizations also play a certain role. Of course, many enterprises carry out certification based on multiple above reasons.

**Table 4 Scoring Frequency, Average and Difference for Enterprises' Motivation for Forest Management Certification**

Motivation	Scoring frequency and average for all samples (n=75)						Average score given by forest management units (n=32)	Average score given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
<b>(1) Direct market benefits</b>						<b>3.66</b>	<b>3.43</b>	<b>3.83</b>	<b>0.083*</b>
Access to market	3	2	7	12	51	4.41	4.13	4.63	0.038**
Gain or increase market share	6	6	23	15	25	3.63	3.44	3.77	0.261
Premium for certified products	17	11	23	8	16	2.93	2.72	3.09	0.264
<b>(2) Indirect market benefit</b>						<b>3.50</b>	<b>4.12</b>	<b>3.04</b>	<b>0.003**</b>
Fulfill corporate social responsibility	8	11	21	7	28	3.48	4.25	2.91	0.000***

Build harmonious community relations	14	16	15	7	23	3.12	3.88	2.56	0.000***
Improve the competitiveness and reputation of the company	2	13	15	16	29	3.76	4.06	3.53	0.063*
Improve the corporate image and brand	3	10	16	15	31	3.81	4.25	3.49	0.007***
Protecting the environment and biodiversity	12	7	24	9	23	3.32	4.16	2.70	0.000***
<b>(3) Improving Forest Management Leve</b>						<b>3.52</b>	<b>4.08</b>	<b>3.11</b>	<b>0.000***</b>
Introduce international advanced forest management model and criteria	10	6	21	14	24	3.48	3.97	3.12	0.007***
Improve the company's forest management system	6	7	18	23	21	3.61	4.13	3.23	0.001***
Standardize forest management technology system	6	8	20	21	20	3.55	4.09	3.14	0.001***
Improve sustainable forest management ability and level	7	8	17	22	21	3.56	4.06	3.19	0.002***
Ensure sustainable levels of forestry production	12	5	18	20	20	3.41	4.16	2.86	0.000***
<b>(4) Obtaining External Support</b>						<b>2.93</b>	<b>2.86</b>	<b>3.12</b>	<b>0.207</b>
Central or local government support	17	14	12	18	14	2.97	2.75	3.14	0.253

Pressure or support from non-governmental environmental organizations	16	10	17	15	17	3.09	2.72	3.37	0.054*
Financial support from international financial organizations	23	12	18	6	16	2.73	2.56	2.86	0.402
<b>Subtotal</b>	<b>162</b>	<b>146</b>	<b>285</b>	<b>228</b>	<b>379</b>	<b>3.43</b>	<b>3.71</b>	<b>3.22</b>	<b>0.026**</b>

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.



**Figure 17 Ranking of Average Scores for Motivations for FSC Forest Management Certification**

#### 4.1 Direct Market Benefits

It is the most fundamental starting point of most forestry enterprises to seek for direct market benefits. Direct market benefits mainly include three aspects. First, acquire market access and meet the mandatory needs of customers. In China, as in most other countries, market access, especially in environmentally sensitive markets such as Europe and the United States, is the main motivation for forestry enterprises to carry out forest certification. Buyers or retailers in these markets require certified forest products because of market policies, market conditions, and corporate risk management. For example, IKEA, the

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world's largest wood products retailer, has a wood procurement policy that requires its wood products to be certified by a trusted forest certification system. Driven by this policy, a large number of forest management enterprises in the Chinese mainland, as direct or indirect suppliers of IKEA, carried out FSC forest management certification, such as Fuyang Dake New Materials Co., Ltd, Yeji Liren Forestry, Furen Forestry, Shuangyi Bamboo, Longtai Bamboo, Shaowu Furen, Maoming Daya, Zhaoqing Daya, Sanwei, Boom Long, Dongying Zhenghe, etc. Second, acquire or expand market share (such as developing new customers or new markets). These are mainly domestic enterprises or non-sensitive market, but expect to expand international market through certification, including Zhuxiangxin Bamboo Professional Cooperatives in Yong'an City, Fujian, Huahong Wood Industry Company in Huaiji County, Zhaoqing, Guangdong, Fuyu Forestry Company in Pingle County, Guilin City, Guangxi, Huajin Group Co., Ltd. in Nanning, Guangxi, Linhe Wood Co., Ltd. in Pizhou City, Jiangsu, Lvxin Forestry Co., Ltd. in Pizhou City, Jiangsu, etc. Third, seek premium for certified products. The price of certified products is relatively high, and forest operators expect to acquire higher revenue through certification, including Zhangping Wuyi State-owned Forest Farm in Fujian, and Jinsen Forestry Co., Ltd. in Jiangle County, Shanming City, Fujian.

China is a major importer and exporter of forest products. In recent years, with the development of the forest industry and the continuous increase of foreign investment, the export volume of paper, furniture and other deep processing products has been increasing day by day. Demand for certified forest products is growing in the international market. In this context, China's export-oriented furniture enterprises and wood processing enterprises first felt the pressure from the international market. They began to pay attention to and seek CoC certification. They took the lead to get forest certification in China. The demand of processing enterprises for certified raw materials has also promoted the development of forest management certification in China. From the viewpoint of market promotion, there are mainly four types. First, processing enterprises or forest companies with raw material forest bases and processing chains directly apply for certification, such as Jian'ou Furen, Shandong Longsen, etc. Second, processing enterprises cooperate with forestry enterprises and fund the forestry enterprises as the supply bases of their certified raw materials to apply for certification, including Changhua Forest Farm, China's first one to apply for certification, Longquan Nengfu, Fuyang Yongchang Bamboo Industry Association, etc. Third, to promote local economic development, the local government promotes local state-owned forest farms or the forestry bureau to carry out certification according to local processing enterprises' needs, such as



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Anji Bamboo Industry Association, the State-owned Forest Farm of Shunchang County, Fujian, Linyi Lvda, etc. Fourth, forestry enterprises which provide raw materials for certified processing enterprises took the initiative to apply for certification due to market needs, such as Paiyangshan Forest Farm in Guangxi, etc.

Judging from the development of the international forest certification market, policies and promotion measures formulated by stakeholders have played a very important role for cultivating the market of certified products and promoting enterprises to seek for forest certification, such as the green procurement policies and other policies promulgated by the government, pressure and support from non-governmental environmental protection organizations, aid agencies and trade organizations, the promotion mechanism of the certification system, the application of new methods and combination with other related policies and means. In particular, the Lacey Act promulgated by the United States in 2008, the European Union Timber Regulation promulgated by the European Union in 2010 and other laws and regulations on timber legality further promoted the development of forest certification. For example, the European Union Timber Regulation requires EU operators to establish a due diligence system or fulfill their due diligence obligations to prevent illegally harvested timber from entering the market. Forest certification is a certification of sustainability. Its criteria contains requirements on environment, society and economy. Legitimacy is the minimum requirement of forest certification criteria. Different forest certification systems have also established the chain of custody tracking and certification system. In principle, certified products can meet requirements on timber legitimacy. Currently, the European Union Timber Regulation does not directly endorse forest certified products. If operators believe that the FSC and other forest certification systems are reliable enough, forest certification can be then used as a tool of risk assessment and aversion, but it could neither be direct evidence of the timber legitimacy, nor be the basis to exempt the operator from the liability to collect related information and assess all risks aversion elements. In practice, many Chinese companies and European operators and regulatory bodies use FSC as a tool to prove the low risk of timber legitimacy to meet the requirements of relevant acts.

#### **4.2 Indirect Market Benefits**

Seldom enterprises apply for forest certification only for the purpose of improving corporate image, enhancing corporate reputation and fulfilling corporate environmental and social responsibilities, but these indirect market

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benefits still play a very important role for decision making by the certified enterprises for certification. It was learned from the survey that many enterprises also expect to obtain indirect market benefits through certification, mainly including improving corporate image, establishing industry brand, and improving the competitiveness and reputation of products, such as Pushang State-Owned Forest Farm at Shunchang County, Nanping City, Fujian, Qingyuan Forest Farm at Qingyuan County, Lishui City, Zhejiang and other state-owned forest farms, Yingran Forestry Development Co., Ltd. in Shangrao, Jiangxi, Guangxi Fegnlín Company and others listed companies and other enterprises promoted by processing enterprises. The motivation is weaker for other indirect market benefits, such as performing social responsibilities of the enterprises, protecting the environment and biodiversity and building harmonious community relations.

### **4.3 Improving Forest Management Level**

Most enterprises expect that their forest management level can be improved by forest certification through introducing international advanced forest management concepts and criteria, and improving the company's management system, such as Nanning Fenglin Forestry Co., Ltd. in Guangxi, Muchuan Forest and Bamboo Development Co., Ltd. in Leshan, Sichuan, etc.

### **4.4 Obtaining External Support**

#### **4.4.1 Support and promotion from non-governmental organizations and other institutions**

The support and promotion of non-governmental organizations and other institutions is not the main motivation of Chinese forestry enterprises to carry out certification, but it plays an important role in guiding some enterprises to move towards certification, especially in the early development stage of forest certification in China. Under the support of FSC China Office, WWF Beijing Office, IKEA, Chinese Academy of Forestry and other institutions, a series of publicity, promotion and capacity building activities for forest certification have been carried out in China and a number of forestry enterprises have been directly promoted to carry out pilot work for forest certification.

Project funding and technical support has directly promotes the first batch of state-owned forestry bureaus in the Northeast China to develop forest certification, including Youhao Forestry Bureau, Baihe Forestry Bureau, etc. Later, many other forestry bureaus and forestry enterprises, such as Muling Forestry Bureau, Dong Fang Hong Forestry Bureau, Jilin Forestry Industry, Huichun Forestry Bureau, Dunhua Forestry Bureau, etc., have made good

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demonstration and model for the development of forest certification in China. Many forestry companies in the world have carried out certification due to the pressure of international non-governmental environmental protection organizations. In China, non-governmental environmental organizations are still weak and their influence on this respect is relatively small.

#### **4.4.2 Support from international capital or financial institutions**

At present, there are not many enterprises in China that have acquired support of international capital for certification. However, the trend is becoming increasingly obvious that some forestry enterprises were restricted from requirements on forest certification of international financial organizations (such as international financial companies under the World Bank, HSBC, etc.) when they applied for forestry loan and financing from these financial institutions, such as Stora Enso, Guangxi Fenglin, etc.

#### **4.4.3 Government and national policy support**

At present, the certification of Chinese enterprises can seldom directly supported and promoted by the government and national policies. However, China's long-term strict forest management system and the national promotion of the compilation of forest sustainable management and forest management plans and other actions have laid a good foundation for forest certification work. In particular, state-owned forests, as the subject for forest certification in China, are normally well managed. During the process of certification, some enterprises have acquired support from the government for policies, labors, resources or capital. For example, Anji Forestry Bureau, in the name of Anji Bamboo Industry Association, and Linyi Forestry Bureau, in the name of Lvda Forestry Cooperation Development Service Center, have directly promoted joint certification work in their districts, and assume partial certification costs, which was the first in China. Fujian Zhangping Forestry Bureau has cooperated with related enterprises to jointly promoted the certification of the state-owned forest under its control. Besides, some local governments have also promulgated measures to grant fiscal subsidy for international certification. Enterprises acquiring forest certification can apply for provincial level special fund support and apply for reimbursement of a part of certification costs. Besides, Guangde Bamboo Industry Association in Xuancheng City, Anhui, Meishen Bamboo Co., Ltd. in Jian'ou City, Fujian and Taojiang Bamboo Industry Association in Yiyang City, Funan also acquired support from the local government in certification process.

## 5. Influence of FSC Forest Management Certification in China

The influence of forest certification is reflected in the four aspects, including forest management, social impact, environmental impact and economic impact. All stakeholders scored each index from 1 to 5 with the base score of 3.5. If the score of the index is higher than 3.5, it means that the role or impact of the index is significant, and vice versa. The scoring frequency, average and the difference of stakeholders are shown in Table 5. According to this table, main influences of forest certification include social impact, environmental impact and impact on forest management and the economic impact is not significant. Besides, forest managers give obviously higher scores for social impact, environmental impact and impact on forest management than scores for other indexes, which indicates that compared with other stakeholders, forest managers believe that certification has a greater impact than other stakeholders.

**Table 5 Scoring Frequency, Average and Difference for the Overall Influence of Forest Management Certification**

Overall influence	Scoring frequency and average score for all samples (n=75)						Average given by forest managers (n=32)	Average given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
Social impact	50	51	108	169	222	3.77	4.16	3.48	0.008***
Environmental impact	42	52	123	141	167	3.65	3.96	3.41	0.037**
Impact on forest management	103	69	303	254	321	3.59	3.96	3.32	0.007***
Economic impact	45	76	144	112	148	3.46	3.58	3.37	0.399
<b>Total</b>	<b>240</b>	<b>248</b>	<b>678</b>	<b>676</b>	<b>858</b>	<b>3.62</b>	<b>3.92</b>	<b>3.40</b>	<b>0.017**</b>

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.

### 5.1 Social Impact

According to the nationwide questionnaire survey of stakeholders, the scoring frequency and average for social impact of forest management certification carried out by forestry enterprises as shown in Table 6 below. The average score is 3.77, indicating that the overall social impact of forest certification in China was significant. The average score given by forest management units is 4.16, significantly higher than the average score given by other stakeholders which is

3.48. In particular, forest management units believe the certification activity has high impact on the protection of workers' rights and interests, improving the worker's health and safety, proving local residents (including indigenous) with employment and other services, protecting places with special meaning to local residents (including indigenous), reducing negative impact of business activities to local communities and promoting the participation of all parties in forest management activities, etc. Other stakeholders believe that the impact is not so high.

More intuitively, the average social impact of forestry enterprises to carry out forest management certification is reflected by a line chart (see Figure 18). The average score of various indexes is higher than 3.5, which indicates that the impact of these indexes is quite significant.

**Table 6 Scoring Frequency, Average and Difference for Social Impact of FSC Forest Management Certification**

Social impact	Scoring frequency and average score for all samples (n=75)						Average given by forest managers (n=32)	Average given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
Clarify forest rights and promote dispute settlement	9	8	12	15	31	3.68	3.94	3.49	0.176
Safeguard employees' rights and interests	4	7	11	21	32	3.93	4.34	3.63	0.010**
Improve employees' health and safety	6	5	12	17	35	3.93	4.34	3.63	0.015**
Protect the traditional and legal rights of the local people (including indigenous people)	8	5	13	24	25	3.71	3.94	3.53	0.184
Provide employment or other services to local residents (including indigenous people)	6	6	17	21	25	3.71	4.06	3.44	0.031**
Protect places with special significance for local people (including indigenous people)	7	7	12	23	26	3.72	4.25	3.33	0.002***
Reduce the negative impact of business activities on the community and improve community relations	6	7	15	23	24	3.69	4.19	3.33	0.002***

Strengthen communication with stakeholders and promote participation by all parties	4	6	16	25	24	3.79	4.25	3.44	0.002 ***
<b>Total</b>	<b>50</b>	<b>51</b>	<b>108</b>	<b>169</b>	<b>222</b>	<b>3.77</b>	<b>4.16</b>	<b>3.48</b>	<b>0.008</b> ***

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.



**Figure 18 Ranking of Social Impact of FSC Forest Management Certification by Average Score**

Combined with the above questionnaire survey, stakeholder interviews, field visits and case studies, the social impact of FSC certification is mainly reflected in the following aspects.

### **5.1.1 Protect employees' rights and interests and improve their health and safety**

In general, Chinese forestry enterprises have established relatively sound worker health and safety systems, including formulating work safety regulations, carrying out training on work safety, working with permit and work safety inspection. Some Chinese forestry enterprises also provide work safety equipment, but there is still a certain gap. For example, cutting workers do not have sound safety equipment or such safety equipment cannot meet requirements; there is lack of safety rescue equipment at the site, etc. For these problems, most certified forest management enterprises are configured with

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safety equipment for cutting workers, such as safety helmets, brightly colored overalls, etc., and overalls and masks for nursery practitioners, etc., and have formulated the emergency rescue plan and configured necessary medical kits and commonly used drugs at the workplace. Workers at the workplace have been properly training on safety with corresponding records kept. However, this problem is currently still the main gap or source of dispute for Chinese forestry enterprises. It is quite hot in the south and most safety equipment are quite heavy. Therefore, workers are not willing to wear or think it is unnecessary to wear such equipment, especially for the cutting of some small-diameter timbers, such as bamboo and eucalyptus (see Figure 19, case 1).



**Figure 19 Certification Promotes Enterprises to Configure Safety Equipment and Medical Kits**

Certification has also improved workers' wages, benefits and living conditions. In general, China's forestry enterprises have established relatively sound wage, insurance and welfare systems in accordance with relevant legal requirements. But certification has strengthened welfare treatment and promoted the establishment of insurance system for outsourced workers who are usually vulnerable group and not directly managed by the forestry enterprise. The certification requires operators to monitor contractors (companies or individuals) and requires that outsourced workers should also enjoy such benefits and treatment which should not be inferior to local minimum wage criteria. It is also required that forestry enterprises should establish the insurance system covering work related injury, medical treatment, etc. Some forestry enterprises have also improved living conditions of workers at the workplace (including outsourced workers), such as improving conditions of work sheds, drinking water and dining conditions, etc. (see Case 2).

## Case 1- safety equipment for chain-saw operators

FSC China National Forest Management Criteria provides a list of personal safety protective equipment used in forestry production activities where chain-saw operators during logging work are required to wear anti-smashing shoes, cut-resistant pants, cut-resistant gloves, helmets, face masks and earplugs. Organizations applying for FSC forest management certification configured corresponding safety equipment for workers in the early stage according to related requirements, but in order to save the cost, they sometimes bought cheap protective equipment with some hidden dangers, thus resulting in risks to workers' health and safety. The two pictures below are protective equipment configured by certified forestry enterprises for their chain-saw operators during logging operation. The picture on the left is a logging site in the north and the one on the right is a logging site in the south. Both the enterprises ensured correct wearing and use of protective equipment.



In addition to checking whether workers correctly wear all safety protective devices, auditors at the workplace also check whether the toe cap of the safety shoes has steel sheath, whether the cut-resistant gloves and pants have qualified test report and verify the effectiveness of these safety equipment so as to help the enterprises to stop potential safety hazards for workers during work. The figure below is the test report of safety shoes and cutting-resistant gloves. The report has been pre-examined by FSC and it was acquired from a distributor of a forestry enterprise. During pre-examination, auditors found that gloves purchased by the forestry enterprise failed to meet the standards for cutting-resistant gloves and there was no test report for other protective equipment of this enterprise. The enterprise rectified actively and purchased new cutting-resistant gloves meeting EU standard. It also acquired test report for other protective equipment from the distributor so as to ensure personal safety of workers wearing such protective equipment.



Examination reports of safety shoes



### Case 2- living conditions are the workplace

The living conditions at the logging site is a key point to be checked by FSC certification auditors. Auditors will check the site and talk with workers at the site to ensure that the forestry enterprise well guarantees workers' rights and work conditions. The two pictures below are work sheds of a forestry enterprise in the south before and after FSC certification. Before FSC certification, the enterprise adopted the standing forest stock sales mode. Worker recruitment and timber logging were taken charge by the contractor. Non-local workers recruited may erect a simple shed (the picture on the left) in the forest where the living conditions were quite bad. After FSC certification, the company erected marching tent (the picture on the right) at a flat area for workers and provided barreled drinking water for them. Then, the living conditions of outsourced workers are greatly improved. After pre-examination, the company also spread snake-repelling powder around the tend as suggested by the auditor to protect safety of workers.



Shed before FSC Certification

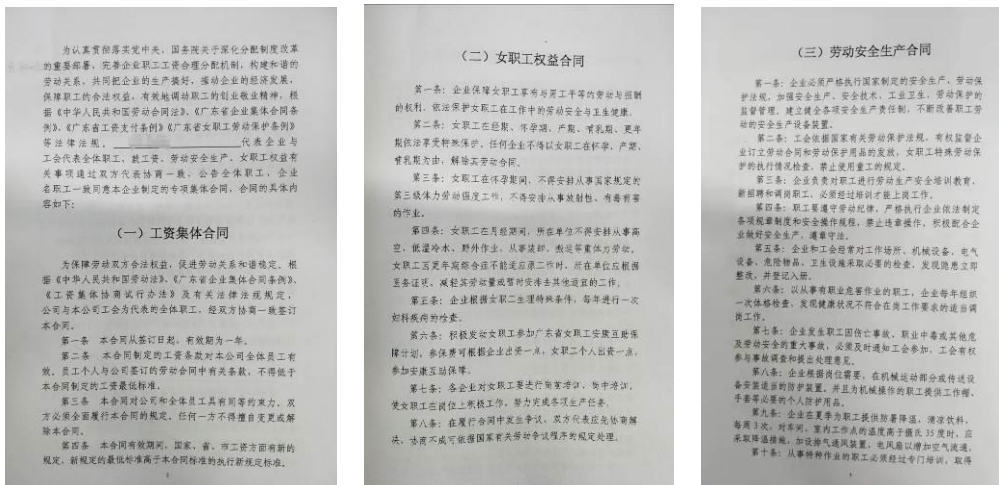


Shed after FSC Certification

Besides, the certification has also promoted the democratic rights of forestry workers and their participation in business decisions. Most state-owned forestry enterprises and state-owned forest farms in China have established a relatively complete system of trade unions, women's representatives or workers' congresses, and workers have organizations or channels to reflect their opinions and voices, but some forestry companies have not yet established the corresponding system. The certification has promoted these enterprises to establish related organizations and improve related systems. Besides, many forestry administrations have implemented the policy of making government affairs open to major events so that employees have more right to know and extensive right to participate (see case 3).

### Case 3- promote forestry workers to join the labor union

A forestry company in the south carried out FSC forest management in order to provide certified raw materials for a wood industry company under the same group. Since the forestry company has fewer than 25 employees so that it had not established a labor union. Upon pre-examination, the auditor found that the company failed to meet requirement of clause 2.19 of the FSC China National Forest Management Criteria and suggested the company to establish a labor union or join the labor union of the wood industry company in order to safeguard rights of workers of the forestry company. Through active rectification, employees of the forestry company joined the labor union of the wood industry company. The pictures below are the wage collective contract, the female employee's equity contract and the labor work safety contract signed by the representative of the forestry company and the trade union after employees of the forestry company joined the labor union of the wood industry company. The audit of FSC certification has promoted employees of the forestry company to join the labor union of the wood industry company so that their rights and interests can be better protected.



The labor contract signed

### 5.1.2 Strengthen communication with stakeholders and promote all parties' participation in forest management activities

FSC certification requires forest operators to consider the impact of forest management activities on other stakeholders, especially local communities, and to conduct social impact assessment and stakeholder advisory activities for key forest activities. Although the impact of forest management activities on other stakeholders has been taken into account more or less in China's forest management practice, and the mechanism has been established to communicate with local communities and other stakeholders, especially governmental

departments, for some specific problems, forest operators have not yet developed systematic coordination mechanisms with local communities in general. The implementation of forest certification has prompted forest operators to make changes. Most certified forestry enterprises have conducted social impact assessment and established communication and consultation mechanism with local communities, although such mechanism needs to be further improved (see case 4).

#### Case 4- Identify local communities affected by forest management activities and their rights

In the early days, FSC certified forestry organizations in China began to provide local communities with employment opportunities under the influence of FSC principles and criteria so that local communities can acquire more channels to communicate with the forestry organizations. In 2018, FSC released “FSC China National Forest Management Criteria” which proposed more detailed requirements. Forestry organizations to carry out FSC certification have to identify local communities affected by their forest management activities and keep records on their related rights. The picture on the left below is of fishponds, pig farms and fruit ranches to be affected by management activities identified by a forestry organization upon field investigation around the certified forest. The picture on the right below is a list of stakeholders of a forestry organization which contains not only related forestry stations and the village committee, but also some nearby villagers likely to be affected by forest management activities of the organization. These parties identified likely to be affected including fruit farm, water-taking places, reservoir for irrigation and traffic roads around the forest. After identifying these communities to be affected by the forest management activities, the forestry organization can take measures in advance to protect them so as to better protect rights and interests of local communities and as the same time, improve the forestry organization’s communication and consultation mechanism.



FSC/FM相关方名单及联系方式				
序号	姓名	电话	职务	所在地
1	李国清	1570009267	河口镇林业站长	林业管理 河口镇
2	陈国清	1590002168	陈有黄园林场场长	林业管理 河口镇
3	钟国清	138000463	村委主任	业务协调 河口镇
4	石国清	1380006319	村民小组长	业务协调 河口镇
5	李国清	1360003843	村民	沟通协调 河口二队
6	王国清	1380007813	村民	沟通协调 河口村
7	李国清	1350004909	护林员	管护工作 河口一队
8	陈国清	1820006609	施工员	监管施工 河口基地
9	徐国清	1350006032	七星林业场场长	林业管理 七星分站
10	王国清	1370007447	护林员	管护工作 七星分区
11	李国清	1830008432	施工员	监管施工 河口基地
12	欧国清	1340007606	鹿都林业场场长	林业管理 鹿都林业站
13	李国清	1380005183	村主任	业务协调 鹿都华石村
14	徐国清	1820009707	村民	沟通协调 东光村
15	李国清	1350005438	村民	沟通协调 七星村
16	钟国清	1570003918	村民	沟通协调 七星村
17	侯国清	1370000388	水库承包人	灌溉保护 南丰镇村

The local stakeholders and their rights identified

### 5.1.3 Protect places with special significance for local residence (including indigenous people)

In general, in China's forest management, places with great significance to local

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residents within the business area are generally protected, such as burial sites, feng-shui forests, temples, historical and cultural sites, etc. There is some conflict with traditional Chinese business philosophy or laws and regulations. For example, traditionally, Chinese rural residents have the habit of burial in the ground which will occupy part of the forest land. FSC also emphasizes the protection of these sites. At present, the main gap is that forestry enterprises have not judged these sites on the basis of stakeholder consultation, and have not developed practical protection measures and formed relevant systems. Forest certification facilitates forestry enterprises to establish relevant systems and to protect such places in practice (see case 5).

#### **5.1.4 Protect the traditional and legal rights of the local people (including indigenous people)**

The ownership of woodlands and trees is the core of such legal rights. The certification can protect the local people's ownership of trees and the right to use the woodlands. This is mainly reflected by collective forest area in south China. Since 2008, a new round of reform of the collective forest right system has been implemented and most of collective forests in China have been allocated to households. Some forestry companies or state-owned forest farms choose to cooperate with local villagers to obtain the management rights of forestlands by means of land lease or cooperative operation and profit sharing. Current problems include, first, many companies initially acquired land through cooperation with local governments and local villagers leased the forest land to the company not in completely voluntary way; second, with the implementation of forest right reform in China, the original ownership of woodland has changed; third, the local villagers who subleased the forest land to the company under the voluntary condition back out with the increase of the value of the forest land and forest resources. The certification requires that the transfer of forestland management rights should be done with knowledge and willingness, which promotes the standardization and legalization of cooperation between forest management companies and original forest right holders, and guarantees the ownership and use right of local villagers to forest resources as well as relevant benefits.

Usually, local residents have traditional rights to access and use the forest, such as gathering wild vegetables, fruits, grazing, access, recreation, and some aquaculture activities (such as under-forest farming), but these rights are often restricted and regulated by forest operators. Many forest operators believe that they have the right to manage and restrict all operations on their forest land. After certification, most forest operators have confirmed and protected such

rights and standardized and controlled some activities or behaviors that do affect forest management and resources, such as tomb worship on Tomb-Sweeping Day and grazing in seedling or young growth periods (see case 6).

### Case 5- protection of sites of special significance

According to traditional forest management concept of China, the forest operators usually strengthen fire prevention management for cemeteries and temples within the forest scope. After FSC certification, to reduce impact caused by forest management activities, forestry organizations will take corresponding measures for these places. The temple and old trees in the pictures below are in the forest of a certified forestry organization in the north. After investigation and assessment, it was found that there were more than 10 old oriental arborvitae and plum trees with more than a hundred years of history and there were two temples. The organization identified these old trees and the two temples to be with high conversion value for special protection, and erected FSC certification billboard.



#### The sites with high significance identified as HCV6

The picture below shows that a forestry organization in the south found during investigation that there was a tomb in the certified forest. It determined the location of the tomb and determine the 0.5mu forest land around as the buffer zone to avoid any impact of forest management activities on the tomb.

调查单元	初开 基地 七星 片区		调查面积 10754 亩						
调查项目	项目分类	保护属性	名称	位置	是否在认证范围内	距林地距离	面积(亩)	保护级别	指标
文物古迹、宗教林等文化价值的林分	<input type="checkbox"/> 文物古迹 (纪念碑、烈士墓、村民拜祭点等) <input type="checkbox"/> 寺庙 <input type="checkbox"/> 塔 <input type="checkbox"/> 风水林 <input type="checkbox"/> 龙脉	无			<input type="checkbox"/> 是 <input type="checkbox"/> 否				距林地边500米范围内
墓地及其他	<input type="checkbox"/> 常有人祭扫 <input checked="" type="checkbox"/> 不常有人祭扫	保护地	灯反山	灯反山	<input checked="" type="checkbox"/> 是 <input type="checkbox"/> 否	0米	0.5亩	缓冲	距林地边100米范围内
满足当地社区基本需求的林分	<input type="checkbox"/> 薪炭林 <input type="checkbox"/> 药用林 <input checked="" type="checkbox"/> 经济林 <input type="checkbox"/> 农作物 <input type="checkbox"/> 其他	保护地	樟树	交椅坑	<input type="checkbox"/> 是 <input checked="" type="checkbox"/> 否	500米	周边10亩	缓冲	

The survey form of protection area network

## Case 6- traditional rights of local communities in certified woodlands are not affected

According to Principle #4 of FSC China National Forest Management Criteria, traditional rights and legal rights of local communities in the certified woodlands shall be specified through the participation of local communities. Forestry organizations usually realize participation of local communities by means of calling, visiting, discussion and others, and specify rights of local communities through consulting related experts, social impact assessment and investigation, consulting with farmers and others. The picture on the left below is the analysis of the impact of forest certification on local people's right to use traditional resources by a forestry organization in the north in the social impact assessment report. Through consulting forestry and social related experts and combining with environmental protection policies and guidelines and through close consultation with local communities, it was confirmed that after forest certification, traditional use right of traffic, firewood picking, grazing and others would not be affected. Traditional rights likely to be affected include the traditional forest management mode, the use of pesticide and chemical fertilizer, protection of sensitive area and the construction of the buffer zone. The picture on the right is the grazing of local villagers in the certified forest of the organization. It can be seen that the right of local communities to graze in the certified forest is not affected.



Local residents' traditional rights in the social impact assessment report

Grazing in the certified forest

### 5.1.5 Provide local residents (including indigenous people) with employment or other services

The certification also attaches importance to the social responsibilities of forestry enterprises to provide employment and service opportunities for local residents. Most certified companies pay attention to the recruitment of local residents and have established an open and transparent recruitment procedure. Besides, they have also provided local residents with services or contributed to local economic development by building roads, donating funds for education, building cultural facilities and drinking water projects (see case 7).

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### **Case 7-provide employment and donation for local communities**

Forestry organizations applying for FSC certification usually require the coordination of the local government and the active cooperation of the local community. Therefore, enterprises make a lot of efforts to promote the local social and economic development. The picture on the left below is the social benefit estimated to be created for local communities by a forestry enterprise in the south after FSC certification. The company plans to provide a large number of employment and labor service opportunities for society through forest management in the next 10 years and it is expected to provide labor use by 200,000 times for forest management. Surrounding villagers acquire income from input and forest land lease, which is beneficial to maintain social stability and healthy development. According to the company's list of condolence donations to local communities, the company provided more than 200,000 yuan for local villages, county and town as solatium, donation to help the poor, sponsor and others in one year from the beginning of 2018 to the beginning of 2019. Besides, the company has also actively assumed related social responsibilities.

#### **5.1.6 Reduce the negative impact of business activities on the community and improve community relations**

After certification, many enterprises have strengthened the connection and communication with the local community and their relationship with local communities has been improved. Some social conflicts have also been eased. Some enterprises also take the initiative to undertake corporate social responsibility, invest in and participate in the construction of local infrastructure or services, including roads, cultural facilities, water network and education.

#### **5.1.7 Clarify property rights and promote dispute settlement**

China implements a system of registration and certification for forests, trees and woodlands in accordance with the law, and adopts the certificate of forest with a uniform national pattern and serial number. In 2008, China launched the reform of collective forest right system to delegate the right to use and manage forests and woodlands to farmers and to further clarify the ownership of trees and the right to use woodlands. At the same time, China has also promulgated the Measures for the Settlement of Dispute on Forest and Woodland Ownership (1996). Various provinces and cities have formulated specific mediation procedures under the national legal framework. However, due to the different changes of China's forest rights policy, there are historical problems left over. In addition, due to the fragmentation of woodlands and the staggered boundary between forest lands and agricultural lands, the boundary of many woodlands is

not very clear, thus leading to the existence of forest rights. To apply for the certification, many enterprises have established their forest land dispute settlement procedure according to national and local legal frameworks, which has promoted the forest right confirmation and mediation of related disputes.

## 5.2 Environmental Impact

According to the nationwide questionnaire survey of stakeholders, the scoring frequency and average for environmental impact of forest management certification carried out by forestry enterprises as shown in Table 7 below. The average score is 3.65, indicating that the overall environmental impact of forest certification in China was significant. The average score given by forest management units is 3.96, significantly higher than the average score given by other stakeholders which is 3.41. In particular, forest management units believe the certification activity can reduce negative impact of various forest management activities on environment, improve the forest's environmental value and service functions, strengthen water resource protection, protect soil structure and fertility, promote forest recovery, regeneration and succession to a more natural state. Other shareholders believe that the impact is not so high.

**Table 7 Scoring Frequency, Average and Difference for Environmental Impact of FSC Forest Management Certification**

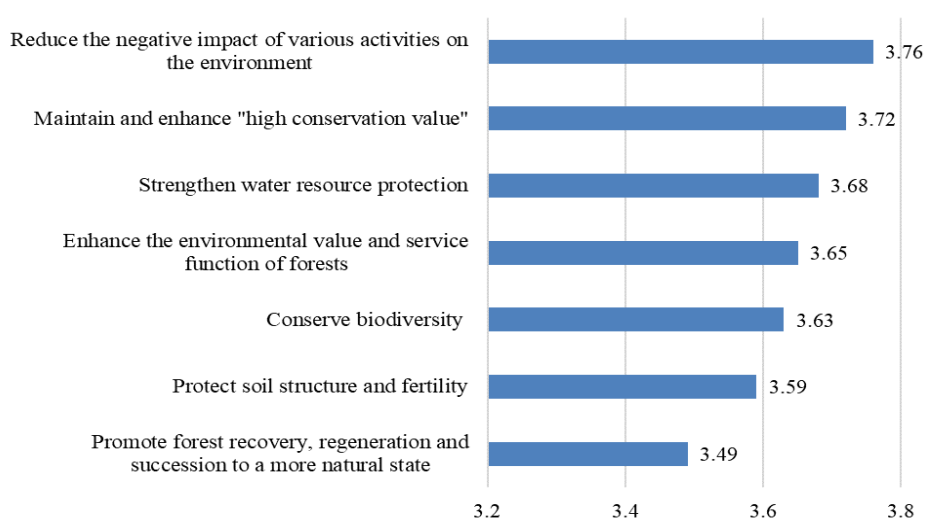
Environmental impact	Scoring frequency and average score for all samples (n=75)						Average given by forest managers (n=32)	Average given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
Reduce the negative impact of various activities on the environment	5	4	21	19	26	3.76	4.03	3.56	0.087*
Enhance the environmental value and service function of forests	6	8	16	21	24	3.65	3.97	3.42	0.060*
Conserve biodiversity	7	10	12	21	25	3.63	3.91	3.42	0.115
Strengthen water resource protection	5	7	17	24	22	3.68	3.97	3.47	0.069*
Protect soil structure and fertility	6	8	19	20	22	3.59	4.03	3.26	0.007***



Maintain and enhance "high conservation value"	7	5	18	17	28	3.72	4.00	3.51	0.105
Promote forest recovery, regeneration and succession to a more natural state	6	10	20	19	20	3.49	3.84	3.23	0.035**
<b>Total</b>	<b>42</b>	<b>52</b>	<b>123</b>	<b>141</b>	<b>167</b>	<b>3.65</b>	<b>3.96</b>	<b>3.41</b>	<b>0.037**</b>

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.

More intuitively, the ranking of average environmental impact of forest management certification by forestry enterprises is reflected by the line chart below (see Figure 19). It is shown that the environmental impact of forest certification from high score to low score is to reduce negative impact of various forest management activities on the environment (3.76), maintain and improve "high conservation value" (3.72), strengthen water resource protection (3.68), improve forest's environmental value and service function (3.65), conserve biodiversity (3.63), protect soil structure and fertility (3.59), promote forest recovery, regeneration and succession to a more natural state (3.49). Most of these indexes have the average higher than 3.5, which indicates that the environmental impact of these indexes is quite obvious. Combining with the questionnaire survey, interview with stakeholders, field survey and case study, the environmental impact of FSC certification is mainly reflected on the following aspects.



**Figure 19 Ranking of Environmental Impact of FSC Forest Management Certification by Average Score**

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### **5.2.1 Reduce negative impact of various forest management activities on the environment**

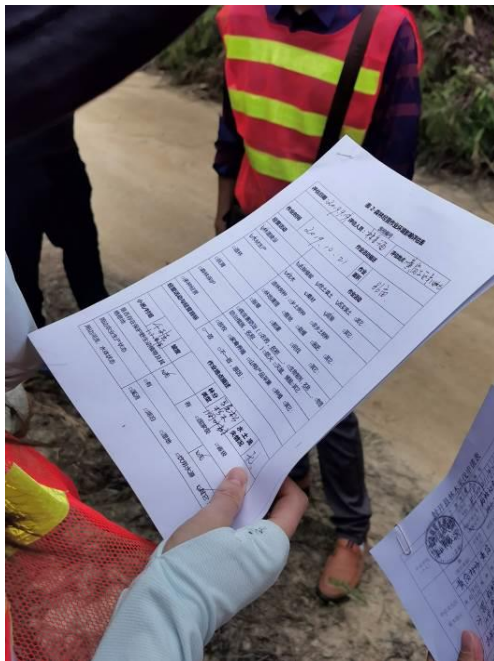
China has implemented the Environmental Impact Assessment Law, but only key national projects are required to carry out environmental impact assessment, including some major forestry projects, and the environmental impact assessment is required to be completed by a qualified institution. For forest certification, it is required that the forestry enterprise should assess the potential environmental impact of major forest management activities when developing the forest management plan and develop appropriate measures. Environmental impact assessment is also required for any forest activities with interference with the forest. FSC does not require the qualification of the institution for environmental impact assessment. Except for major projects for which a qualified assessment institution is required by the state, other forest management units may carry out environmental impact assessment by their own technicians. In practice, most enterprises include the content of environmental impact assessment in their forest management plans according to requirements. On the other hand, it is also required to assess environmental impact before forest cultivation and management activities with interference with the forest. According to environmental impact assessment results, many forestry enterprises have modified their regulations and attached great importance to environmental protection during business operation. However, due to restriction of human resources, technical strength and experience, the implementation is sometimes unsatisfactory (see case 8).

### **5.2.2 Maintain and improve “high conservation value”**

High conservation value forest is a new concept for forest certification. It has gone through a long time from introduction to being recognized and implemented in China. Its criteria is similar to that of China’s ecological public welfare forest, but the concept is not completely the same. It adds protection to social value and its management measures are not completely the same. Except for national reserves, FSC allows to carry out related management activities under the premise of maintaining and improving high conservation value of the forest. The concept of high conservation value forest provides forests not included in the conservation area of China with a feasible channel. Comparing with the public welfare forest protection system of China, it is more flexible and meets the needs of forest management (see case 9).

## Case 8- environmental impact assessment carried out before logging

Logging is quite disruptive to the land. The forest management units for FSC certification will assess potential near-term and long-term impact of forestry activities on the environment. They will make environmental impact assessment in advance and prepare the EIA report. The picture on the left below is the auditor checking the Environmental Impact Assessment Form for Forest Management Operation of a forestry enterprise in the south at the logging site. The enterprise assessed environmental impact of forest road construction (including vegetation removal, earth excavation, landfill and surface soil compacting) and timber production (including logging, skidding and transportation) during logging operation. Situation at the workplace and surrounding areas was described. Based on the instructions to evaluation indexes (as shown below), the level of impact on soil, water resource, conservation areas, landscape, protected species, biodiversity, special places, own resources of local residents, high conservation value and others. Based on environmental impact assessment results, the enterprise formulated and took measures to make forest road planning in advance, clear up drainage ditch in advance, set buffer area and others to reduce negative environmental impact.



附：评估指标说明

评估指标	评估标准
<b>土壤</b> (包括林地生产力和水土流失等)	a) 几乎所有的作业活动都应考虑对土壤的影响。 b) 在进行大面积采伐、林地清理、开林道、挖沟、使用化学品时,要特别考虑水土流失、土壤板结、土壤污染的影响。 c) 对土壤的影响应结合前期的监测数据或报告进行,尤其对土壤肥力。 d) 应委托大学或研究机构,至少每年进行一次土壤肥力抽样监测,样点数应不少于5个。
<b>水资源</b>	a) 在进行大面积采伐、林地清理、开林道、施肥、使用化学品时,要特别考虑水土流失、化学品污染对河流、池塘、湿地、水源等水体的影响。 b) 对水体的影响应结合前期的监测数据或有关机构分析报告进行。 c) 应委托大学或环境监管机构,至少每年进行一次水质抽样监测,经营区内及周边的主要水体要作为抽样对象。
<b>保护区</b>	a) 确定经营区内或周边区域是否有国家级、省级、市级等各级各类保护区,并标记在地图上。 b) 如经营区内有保护区,应制定专门的保护方案。 c) 如经营区周边有保护区,应收集和了解有关保护区的保护类型、规模、主要受保护

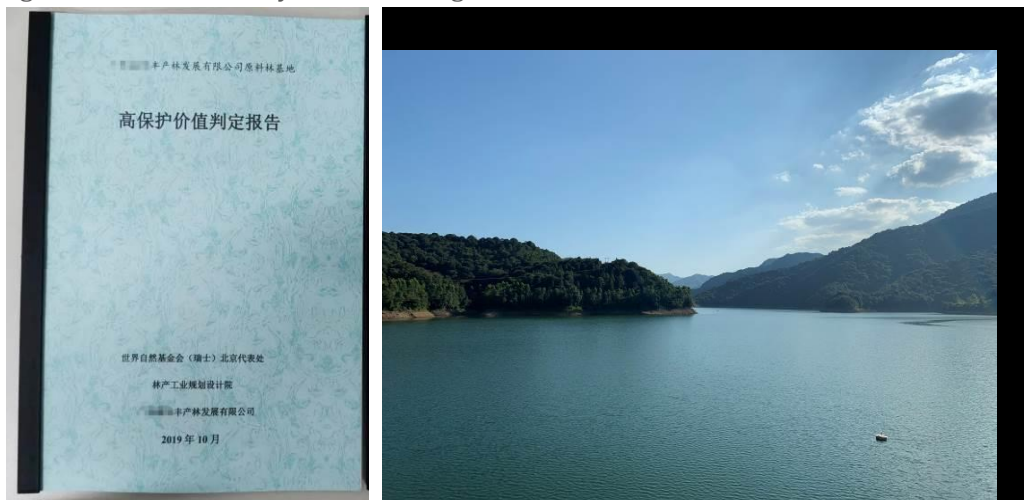
The Environment Impact Assessment reports reviewed

All certified enterprises have assessed high conservation value forests according to FSC requirements, and on this basis, formulated business and monitoring plans. Even part of southern plantations without high conservation value have also taken measures to protect ecologically sensitive areas. In practice, however, some certified enterprises usually encountered some problems due to insufficient understanding of the concept, the lack of relevant knowledge and

the difference between FSC requirements and the national forest classification system, which is one of the criteria for which non compliances are proposed by the certification organization.

### Case 9- maintain high conservation value

High conservation value is a very important point for FSC certification to be different from other forest certification systems. It requires the forest organizations to maintain and enhance high conservation value in the certified scope while ensuring sustainable forest management so as to protect important species, landscape, ecological system, ecological system service functions, needs of surrounding communities and cultural value. High conservation value is also the focus concerned by auditors in the audit process. The picture on the left below is the high conservation value assessment report of a forest company in the south. When carrying out FSC certification, the company assessed high conservation value in the certified scope by means of data searching, expert consultation, field survey, questionnaire survey, interview and others. The picture on the right below is that the woodland covering an area of more than 2,000 mu of the company around a reservoir was assessed to be with high conservation value 4. This wood land can protect the basic ecosystem service functions of the water gathering ground and the conserve water. The enterprise mainly adopted the close-to-nature management mode for this woodland and promoted its restoration to the structure similar to the natural ecological system by means of artificial interference. Specific measures include ecological logging, protective skidding, combining both artificial regeneration and artificial promotion, introducing hardwood species into coniferous forests, and changing monolayer same-age forest into multi-layer different-age forest, etc.



The HCV s reports and water reservation area identified as HCV4

### 5.2.1 Maintain and improve the forest’s environmental value and service functions, protect biodiversity and promote forest regeneration to a more natural state

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Most of the state-owned forest areas have maintained good ecological functions of the forest, perform well for biodiversity and can maintain forest regeneration, but there are also some problems. For example, due to the lack of fund and policy support, young and middle aged forests are not well cultivated. The forest structure is not so reasonable with a high proportion of young and middle aged forests and a increasingly smaller proportion of mature forests. Relying on national low-yield forest transformation, some forest organizations have transferred some woodlands with important ecological functions into plantations and economic forests. There are lack of measures to promote forest regeneration towards natural forests or climax community structure. No sufficient habitat for standing and falling trees has been reserved. These problems have been more or less address in certification. Besides, certification has promoted enterprises to pay more attention to forest's environmental service functions, such as the water gathering areas, water conservation, forest recreation, etc. Many enterprises have strengthened the protection of water sources and the disposal of forest road slope, forest density on both sides of the forest road and soil erosion prevention for the forest road.

Besides, most of the artificial fast-growing and high-yield forests in south China adopt the mode of intensive management of pure forests, such as eucalyptus, fir and bamboo forests, which has resulted in low biodiversity and serious forest diseases and insect pests. Many forests after certification began to focus on the cultivation of mixed coniferous and broadleaved forests, or reserve some native species such as hardwood trees in forest management to protect biodiversity enhance forest structure stability (see case 10).

### **5.2.2 Strengthen the protection of soil and water resources**

Some forestry enterprises in China pay attention to the protection of soil and water. For example, winter logging and centralized skidding have reduced damage to soil. But in general, the soil and water resource protection awareness and action are insufficient, such as the common problem of water and soil loss for forest road construction, the damage of soil fertility and structure by forest clearing and comprehensive land preparation, insufficient buffer zones on both sides of streams and rivers. These are reasons to propose the most NCs of forestry enterprises for environment criteria. After certification, most enterprises pay more attention to water and soil protection in forest management activities. They have prepared related work procedures, adjusted work modes, strengthened governance and built related buffer zones, but in practice, there are still many shortcomings (see case 11).

### Case 11- Soil and water resource protection

Logging, wood gathering, forest land construction, transportation and other activities of forest management units may result in water and soil loss, stream occupation by soil and others of the forest. The three pictures below are workers of a FSC certified forestry enterprise planting grass seeds on bare soil after forest road construction, replanting seedlings on the slope of the road, ramming the topsoil and replanting vegetation to prevent soil erosion.



#### The grass seedling and trees planted for the soil protection along the roadside

According to clause 6.7.5 of FSC China National Forest Management Criteria, recovery measures should be taken in case of any damage caused by previous utilization of soil and water resources to waterways, water bodies, riversides and its connectivity, water quality or water quantity. In the picture on the left below, a forestry enterprise found during FSC certification preparation that there were problems of soil and water loss, stream occupation and other problems for forest road construction. To reduce water and soil loss, the enterprise used timber piles to strengthen road slope and took other measures (see the picture on the right below) and replanted vegetation around stubs for road restoration and reinforcement.



#### The soil protection measures taken by FSC certified companies

### 5.3 Impact on forest management

According to questionnaire survey of stakeholders around the country, the scoring frequency and average of impact of forest management certification by forestry enterprises on forest management are shown in Table 8.

**Table 8 Scoring Frequency, Average and Difference for Impact of FSC Forest Management Certification on Forest Management**

Impact on forest management	Scoring frequency and average score for all samples (n=75)						Average given by forest managers (n=32)	Average given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
Improve the forest sustainable management awareness and ability of the forestry enterprise	2	6	16	19	32	3.97	4.09	3.88	0.418
Strengthen the implementation of forestry and relevant laws and regulations	4	1	25	18	27	3.84	4.22	3.56	0.009***
Promote the formulation and implementation of forest management plans	4	3	19	24	25	3.84	4.13	3.63	0.053*
Promote the establishment and implementation of the forest monitoring and assessment system	3	3	20	24	25	3.87	4.06	3.72	0.168
Promote sustainable production of wood and non-wood forest products	5	2	23	23	22	3.73	4.09	3.47	0.015**
Improve forest productivity and quality	9	5	29	13	19	3.37	3.81	3.05	0.009***
Reduce pests and diseases in the plantation	11	9	27	11	17	3.19	3.78	2.74	0.001***

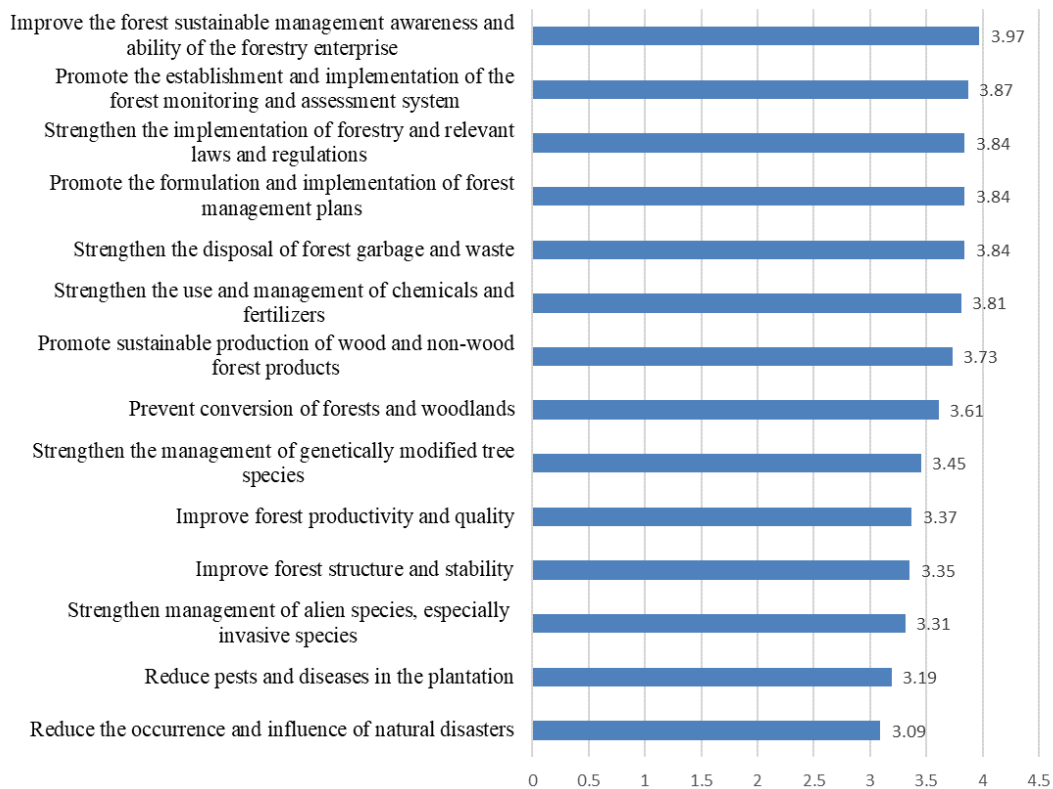
Reduce the occurrence and influence of natural disasters	14	7	27	12	15	3.09	3.59	2.72	0.005***
Improve forest structure and stability	9	8	22	20	16	3.35	3.72	3.07	0.027**
Strengthen management of alien species, especially invasive species	9	10	25	11	20	3.31	3.75	2.98	0.011**
Strengthen the disposal of forest garbage and waste	6	3	16	22	28	3.84	4.22	3.56	0.018**
Strengthen the use and management of chemicals and fertilizers	7	2	16	23	27	3.81	4.13	3.58	0.057*
Strengthen the management of genetically modified tree species	12	6	17	16	24	3.45	3.91	3.12	0.017**
Prevent conversion of forests and woodlands	8	4	21	18	24	3.61	3.91	3.40	0.088*
<b>Total</b>	<b>103</b>	<b>69</b>	<b>303</b>	<b>254</b>	<b>321</b>	<b>3.59</b>	<b>3.96</b>	<b>3.32</b>	<b>0.007***</b>

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.

The overall average is 3.59, indicating that forest certification in China has relatively significant impact on these factors. The average score given by forest management units are 3.96, significantly higher than the average given by other stakeholders at 3.32. In particular, forest management units believe that forest certification has higher impact on promoting sustainable production of timber and non-wood forest products, improving forest productivity and quality, reducing plantation forest diseases and insect pests, reducing the occurrence and impact of natural disasters, improving forest structure and stability, strengthening management of alien species, especially invasive species, strengthening the disposal of forest garbage and waste, strengthening the management of genetically modified tree species and other aspects.

More intuitively, the average ranking of the impact of forest management certification by forestry enterprises on forest management is represented by a broken line graph (see Figure 20).





**Figure 20 Ranking of Impact of FSC Forest Management Certification on Forest Management by Average Score**

Based on questionnaire survey, interview of stakeholders, field survey and case study, it is concluded that FSC certification mainly has impact on forest management on the following aspects.

### **5.3.1 Improve forestry enterprise's awareness of sustainable management**

The concept of sustainable forest management in China has a history of nearly 20 years from introduction to promotion, but most forestry enterprises fail to put it into practice or just focus on partial requirements. Forest certification provides a new mechanism to promote sustainable forest management from theory to practice. Through the promotion and implementation of forest certification criteria, forestry enterprises change in practice from traditional forestry management to sustainable management and closely associate forest management with social, environmental and economic requirements. They have adjusted operation philosophy. In the past, they mainly focused on wood production, but after certification, they have changed to diversified operation based on available resources of the forest, and also taken into account ecological, economic and social benefits, and have changed from logging to strengthening forest cultivation, protection and sustainable utilization (see case 12).

## Case 12- The awareness of sustainable forest management is improved

To facilitate timber transportation, the construction of forest roads in the logging area is usually needed according to the actual situation, which is also a key point to be examined by FSC certification auditors during on-site audit. The picture on the left below is the logging site of a forestry enterprise during pre-examination. The auditor communicated with the enterprise and got to know that the forest was contracted to a local logging contractor, and both forest road construction and logging were taken charge by the contractor. Due to the lack of monitoring of the forest by the enterprise, no planning had been made for road construction. To facilitate construction, the contractor directly opened three roads close to the bottom of the trench on the top of the mountain and at the bottom of the trench. No enough buffer area has been reserved and waste of woodland has also been caused.

Unreasonable forest road construction in the logging area will cause loss to the afforestation area and will also affect the service life of forest road, which will increase forest cost, and is not conducive to sustainable forest management. After the auditor pointing out such problems, the enterprise promptly cleared away losing residual at the bottom of the trench aside the road in the logging area. Besides, the enterprise acquired a deeper understanding on sustainable forest management so that it strengthened monitoring of the woodland during management and avoided excessive destruction of water and soil resources, which can not only provide guarantee to the long-term utilization of the forest by the enterprise, but also avoid damage the interests of the local villagers which may cause dispute with local villages. The enterprise began to actively take measures to coordinate the relationship between forest management and society, environment and economy.

For new logging areas, the enterprise prepared a forest road map plan for logging based on landform of the logging area (see the picture on the right below), organized workers for field survey of the logging area, check whether there is any tomb along the proposed forest road, whether the proposed road is close to river or reservoir, whether it will encroach on the interests of local villagers and others, and try to avoid damaging of water resources and interests of local villagers.



林木砍伐开设林区路规划线路图



Logging road planning to avoid the soil and water protection

During logging survey and design, the enterprise drew the logging buffer area schematic diagram (see the picture on the left). Trees within 3m away from the road were included in the buffer area which would not be cut. Before logging, the gutter way aside the road was cleared to avoid water accumulation on the surface of the road during raining days so as to protect the forest road. Besides, the enterprise established logging area billboard, safety warning board, and the notice board requiring labor protective and safety articles before accessing the construction site at the entrance of the logging area so as to strengthen management of the logging area.



New logging area buffer

New logging area signboards

The enterprise also set construction warning signs aside the road of the logging area on both ends (see the picture on the left below) to remind nearby villages to keep far away from the logging area. Oil receiving tray is configured at the logging area to prevent oil leaked when adding oil to the chain saw from penetrating into forest soil. Fire extinguishers and medical kits are configured to ensure prompt disposal in case of any emergency. The enterprise said that FSC certification can help many enterprises to gradually make up many disadvantages and risks for forest management. While improving management level and benefit, FSC certification can also strengthen environmental protection and facilitate the construction of harmonious society and is of great significance.



On-site warning signs



Oiling on the tray



The auditor checks the medical kit

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### **5.3.2 Promote the establishment and implementation of the forest monitoring and assessment system**

The forest monitoring system is also a key point for Chinese forestry. China has a relatively complete monitoring system for forest resources, including the national first-category inventory, second-category inventory and the forestry enterprise's third-category inventory, etc., and also has a relatively sound monitoring system for forest fires, diseases and insect pests, the forest management activities inspection and acceptance system and the forest management cost-benefit monitoring system. Besides, China has established the "forest resources supervision commissioner" and the "three total-amount inspection" system for forest resources, and has been strictly monitoring the logging of forest resources and the management of timber. However, the forest resources inventory system of some enterprises is defective which cannot describe the status quo and dynamic changes of forest resources completely or accurately. Besides, the forest monitoring system and related indexes are not so good. There is no monitoring of wild fauna and flora and their change, no monitoring of impact of forest management activities on environment and social value, no monitoring of non-wood forest products, and there is no corresponding monitoring staff, monitoring technology, methods and the monitoring result analysis, summarization and feedback mechanism. Monitoring results are not applied to improve forest management activities. According to requirements of forest certification, most forest management enterprises have established the forest monitoring and reporting system which, however, needs to be further improved (see case 13).

### **5.3.3 Promote the compilation and implementation of forest management plans**

The Forest Law and the Guidelines for the Compilation and Implementation of the Forest Management Plan promulgated in China have laid a foundation for developing a feasible forest management plan in China, but FSC certification requirements can still not be completely met. Main problems include:

- The contents of the forest management plan are incomplete. The traditional forest management plan is lack of environmental constraints, environmental protection measures based on EIA conclusions, the plan to protect rare, threatened and endangered species, and maps describing protected areas, planned management activities and land ownership, etc.
- Business objectives are not clear or specific. Long-term business objectives proposed in a general forest management plan are similar to management

principles and are not specific or clear enough.

### Case 13- Promote forest organizations to carry out forest monitoring

Forest monitoring is a very important part of forest management and an important means to reflect effect of forest culturing measures and to verify the effect of sustainable management. Annex 8 of FSC China National Forest Management Criteria puts forward comprehensive monitoring contents based on specific standards and indexes, including environmental impact, social impact and environmental impact of management activities. Forest organizations are required to make comprehensive periodic monitoring and assessment of certified forest. The pictures below are fixed sample land, soil monitoring sampling point and water quality monitoring sampling point set by the consortium established by a forestry enterprise in the north and local farmers. Most of forestry enterprises and private forest organizations are lack of fixed sample lands to reflect forest resource change before certification. FSC certification can promote these forest organizations to establish fixed sampling land so as to better monitor the change of forest resources.



- The forest management plan has poor operability. In China, the forest management plan is usually prepared by a qualified planning and design institute, but is mostly formal. Without field survey, such plan is usually not targeted and poor for operability. Many forest management plans are not formulated based on forest shift so that specific operation measures and operation objectives are still unclear for each forest shift;
- The determination of the annually allowed logging volume is not reasonable. According to the forest management plan in China, the annually allowed logging volume should be rationally determined according to forest resource inventory data, but it is in fact usually affected by national micro policies, logging limits and the will of enterprise leaders and decision makers;
- The forest management plan cannot be effectively implemented. In addition

to the above reasons, forest management activities in China are likely to be affected by the change of national forestry policies and the allocation of timber harvesting quotas. The forest management plans cannot be effectively implemented in many cases.

According to the interview and survey, forest management units have re-compiled or revised their forest management plans according to FSC certification requirements. Aforesaid problems have been more or less emphasized or solved in forest certification process (see Case 14).

#### **Case 14- Promote forestry organizations to compile management plans**

The management plan is an inevitable tool for the planning of sustainable forest management activities and is the basis for forest management. In China, state-owned forestry bureaus and state-owned forest farms have prepared management plans according to national policies. When preparing for FSC certification, they have revised their management plans according to FSC requirements. FSC certification has in practice promoted operators of some collective forests and forestry enterprises to prepare the management plans. Such forestry organizations should collect data on forest resources based on actual situation and then complete the management plan. Forestry organizations with forest work background and forest management plan compilation ability mainly prepare the plan by themselves (see the picture on the left below). For forestry organizations unable to prepare the forest management plan by themselves but being subsidized for forest certification projects, the project will retain forestry experts to prepare the forest management plan (see the picture in the middle). If joint certification is carried out by the forestry company organizing farmers, a planning and design institute will be retained to prepare the plan (see the picture on the right below).



**Forest Management Plan developed**

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### **5.3.4 Strengthen the implementation of forestry laws and regulations**

In general, since a strict forest management system has been implemented in China, and sound policies and requirements have been proposed for forestation and forest culture and management by enterprises, most Chinese forestry enterprises have relatively complete forest management systems, and have established special organs to take charge of the implementation of corresponding forest production activities, such as the forest culturing office, resource office, production office, resource development office, entrepreneurship office, protection office, forest administration office, etc. The state and the province have formulated many technical specifications and criteria, and many forestry enterprises have also formulated relevant criteria and regulations. Forestry enterprises in China can in general meet certification requirement, but they still have made certain improvement, such as forest resource cultivating, management and protection, forest fire control and pest control, etc. For example, the state-owned forest farm of Shunchang County adjusted its main logging mode from clear cutting to selective cutting. It reserved broad-leaved trees and small seedlings. For reforestation, burning is not conducted, which has increased cost of the enterprise, but has maintained the stability of the forest ecosystem and reduced damage to soil and environment.

### **5.3.5 Strengthen the disposal of forest garbage and waste**

The disposal of garbage and waste in forest is a difficult problem at present. Garbage and waste in forest have been neglected by forest operators, which has a negative impact on forest landscape, tree growth, and the living environment of local communities and indigenous people. Garbage disposal systems for rural and forest areas have not been established at the national level, and recycling of some pesticides and pesticide containers has not yet been standardized. It is common to see domestic garbage and waste littering everywhere in forest. The operators and local residents generally lack the corresponding awareness and action. According to certification requirements, forestry enterprises have strengthened the clearance of garbage and waste in forest, and also strengthened the environmental awareness of internal staff and surrounding community residents, and required to remove domestic wastes out of the forest for treatment during forest operations. For example, Caihe Forestry Bureau has recovered forest wastes for centralized destruction, recycled old wood carrier bags to burn for winter warming, and collected waste pesticide bottles for uniform recycling or destruction. FSC requirements on the treatment of wastes and garbage have promoted forest operators to establish the awareness and

habits for waste and garbage treatment and maintaining tidy forest environment. All respondents said that the environmental situation has been greatly improved and a virtuous cycle has been formed (see cases 15 and 16).

#### **Case 15- Clearing forest wastes**

Due to the reason of the beautiful rural construction campaign carried out in China, domestic wastes and construction wastes in forests near to villages have been cleared away, but fertilizer bags, pesticide bottles, feedbags, crop skins and others brought by forest cultivation and diversified management in the forest still exist, which not only damages landscape of the forest, but also causes pollution of soil and water in the forest. FSC certification has obviously improved the problem of wastes in the forest. In the picture on the left below, the operator carried out diversified operation in the bamboo forest, which has lead to bamboo shoots skin and living wastes in the forest. The operator promptly collected these wastes for centralized treatment (see the picture on the right below) to ensure good forest landscape and sanitation.



The forest wastes clearance

#### **5.3.6 Strengthen the use and management of chemicals**

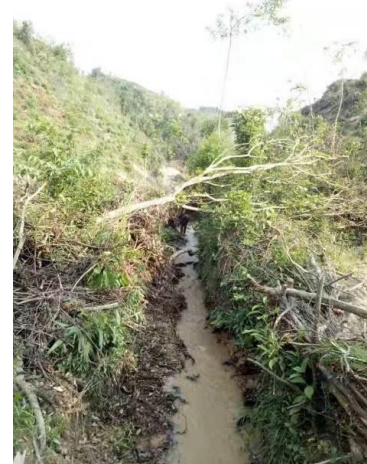
China has formulated relevant rules and regulations on the sale and use of pesticides, insecticide, chemicals and fertilizers, and has strict restrictions on the use of pesticides with high toxicity and residues, but there is no effective supervision for implementation. FSC certification has strengthened the regulation of the use of these chemicals, which, in addition to meeting national legal and regulatory requirements, requires no use of pesticides banned by the world health organization. Most Chinese forestry enterprises use pesticides in plant nurseries, and some drugs are used for pest control or rodent control. In most cases, the use of pesticides is not standardized, and some highly toxic pesticides, such as dibromide, are also used. According to FSC certification requirements, certified enterprises have cleaned chemical pesticides used,



formulated regulations or policies about the use of chemicals, designated special personnel for management and set up special warehouse for chemicals. The use of chemicals has been strictly registered and the safety training and management on the use of chemicals has also been strengthened (see case 17).

### **Case 16- Clearing logging residues**

Many collective forest operators were lack of awareness for environmental protection before FSC certification and discarded some branches and other logging residues at low-lying places during logging operations and pruning. Such low-lying places in the forest usually have stream and spring water. Therefore, negative impact will be caused to water quality, thus affecting water use by residents in the downstream. In pictures below, the auditor found during field audit that residuals were piled in the stream. The auditor required the forestry organizations to rectify. Later, the enterprise made rectification actively. It organized workers to clear away logging residuals in the stream, trained logging workers and reserved buffer area aside the stream.

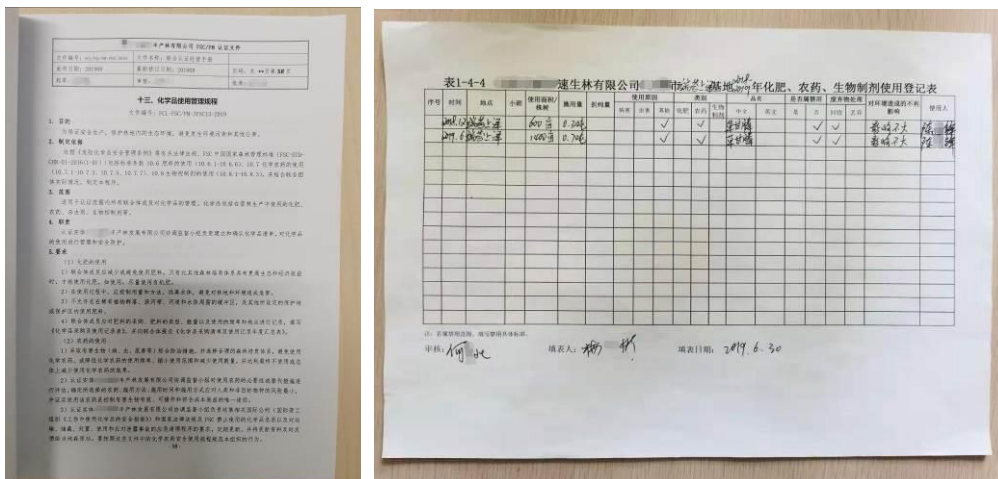


**Logging residues clearing**

### Case 17- Strengthen management of chemicals

Before FSC certification, many forestry organizations were lack of understanding of chemical hazards and usually selected chemicals based on recommendations of the forestry authorities and effect of chemicals. However, pesticides, herbicides, fungicides, rodenticides, hormones and other chemicals used in forest production have many potential hazards to the environment. In the picture on the left below, it is the Regulations for the Management of Chemical Use formulated by a forestry company applying for joint certification of FSC forest management which proposes requirement on the use of chemical fertilizer, pesticides, biological control agent and others, and gives a list of chemicals banned by FSC, instructing members to correctly use chemicals. The procedure document also requires that members should keep records on chemical use. The picture on the right below is the records kept by the forestry company on the use of weed killer by members of the joint.

a forestry company applying for joint certification of FSC forest management



The chemical usage procedure developed and relevant usage records

### 5.3.7 Promote sustainable production, circulation and management of certified wood and non-wood forest products

For certified wood circulation and management, certification criteria on “CoC of forest management” requires that certified wood should be supervised from forest source, logging, transportation, initial processing, storage, to sales and that a special supervision system should be established. Most certified enterprises have established a sound wood logging, transportation and sales management system, including timber inspection and logging acceptance at the logging site, triplicate form of the “log transportation ticket” during transportation, the acceptance from the timber inspection station to the timber storage site, so as to ensure strict timber inspection. Forest certification proposes additional requirements on the general person in charge, the implementation of related training and the establishment of the training system,



### 5.3.8 Prevent conversion of forest and woodland

The conversion of forests and woodlands is a hot issue for forest certification in China. It is required by FSC that conversion from a natural forest to a plantation after 1994 will not be accredited, and that it is prohibited to convert forests into plantations or non-forested areas except in certain circumstances. China has a similar policy to ban the conversion of natural forests into plantations and impose strict rules on the occupation of forestland. However, the concept of natural forest and plantation in China is not completely consistent with the concept of FSC. At present, the core of the dispute is the definition of natural forest and plantation and which woodlands can be transformed. For example, a forestry enterprise in Fujian has been suspended for its certification due to its converting of artificially derived natural pine or fir forests into eucalyptus forests. The new version of criteria can well solve such dispute.

### 5.3.9 Other impacts

The survey indicates that forest certification has also played a certain role in strengthening the management of genetically engineered species and alien species, improving forest structure stability and forest productivity, reducing pests and diseases in plantations and reducing the impact of natural disasters, but the impact was generally small.

### 5.4 Economic impact and cost-benefit analysis

According to the national wide questionnaire survey for stakeholders, the scoring frequency and average of the economic impact of forest management certification by forestry enterprises are shown in table below.

**Table 9 Scoring Frequency, Average and Difference for Economic Impact of FSC Forest Management Certification**

Economic impact	Scoring frequency and average of all samples (n=75)						Average given by forest managers (n=32)	Average given by stakeholders (n=43)	Difference
	1	2	3	4	5	Average			
Increase the price of timber and products to achieve a market premium	8	10	23	19	15	3.31	3.16	3.41	0.369
Stabilize or increase market share and achieve market access	4	7	18	13	33	3.85	3.72	3.95	0.420

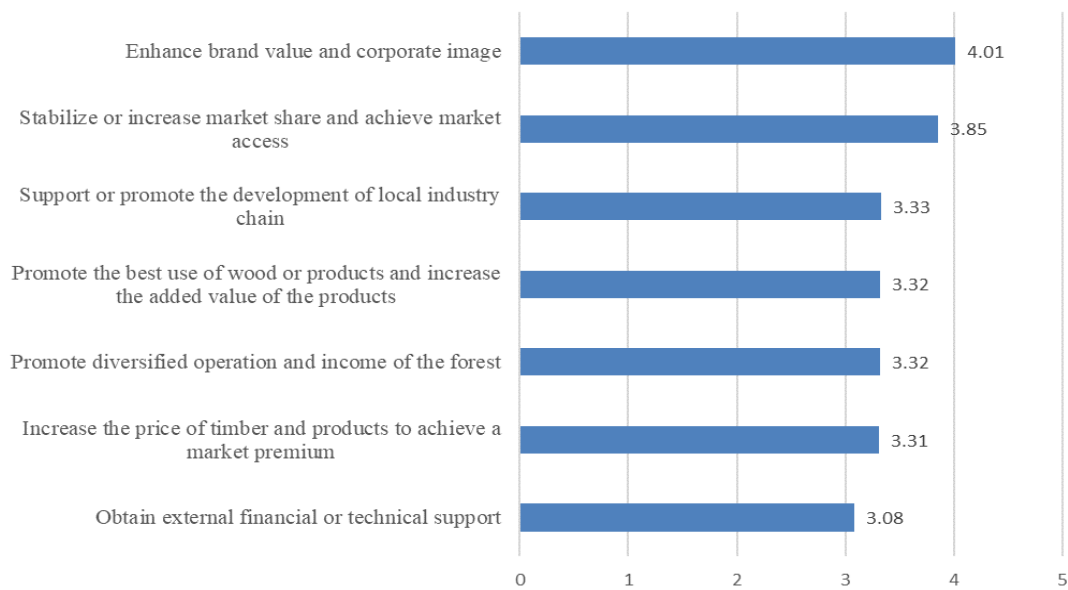
Enhance brand value and corporate image	0	7	15	23	30	4.01	4.38	3.74	0.006 ***
Promote the best use of wood or products and increase the added value of the products	7	12	24	14	18	3.32	3.59	3.12	0.106
Promote diversified operation and income of the forest	8	11	24	13	19	3.32	3.63	3.09	0.079 *
Support or promote the development of local industry chain	7	13	19	20	16	3.33	3.59	3.14	0.122
Obtain external financial or technical support	11	16	21	10	17	3.08	3.00	3.14	0.664
<b>Total</b>	<b>45</b>	<b>76</b>	<b>144</b>	<b>112</b>	<b>148</b>	<b>3.46</b>	<b>3.58</b>	<b>3.37</b>	<b>0.399</b>

Note: \*\*\*, \*\*, \* respectively refer to being significant with difference decreasing in turn under the significance level of 1%, 5% and 10%.

The overall average score is 3.46 which indicates that the economic impact of forest certification in China is not so significant. The average score given by forest management units is 3.58 and the average score given by other stakeholders is 3.37, no significant difference between the two.

More intuitively, the ranking of average economic impact of forest management certification by forestry enterprises is reflected by the line chart below (see Figure 21). Indexes ranked by scores from high to low are improving brand value and corporate image (4.01), stabilizing or improving market share and realizing market access (3.85), supporting or promoting the development of local industrial chain (3.33), improving added value of products (3.32), promoting diversified operation and income of the forest (3.32), improving the price of timber and products and realizing market premium (3.32), and acquiring external capital or technical support (3.08). In general, the economic impact of forest certification is mainly reflected in the first two indexes, namely, improving brand value and corporate image, and stabilizing or increasing market share (scoring over 3.5), while the impact of other indexes is not significant. Comparing with the survey on the enterprises' motivation to carry out certification, the score is relatively low for the certification's economic impact, which indicates that the economic impact or income for enterprises to

carry out FSC certification is lower than expectation.



**Figure 21 Ranking of Economic Impact of FSC Forest Management Certification by Average Score**

#### 5.4.1 Cost-effectiveness Analysis

The cost of forest certification includes direct and indirect costs.

The direct cost is the audit price paid to the forest certification organization. According to incomplete statistics, audit price for FSC forest management certification in China at present includes the initial audit price at about 100,000`350,000 yuan which is about 200,000 yuan on average, and the annual audit price at about 50,000~150,000 yuan which is about 85,000 yuan on average. For small-scale forests in southern China (generally less than 20,000 hectares), the average initial audit fee is about 160,000 yuan, the annual audit fee is 60,000 yuan, and the certification audit fee is 480,000 yuan with a five-year validity period, with an average of 28 yuan per hectare. Due to the increasing number of FSC certification organizations in China and the intensified market competition, the audit cost for forest certification has been greatly reduced in recent years, which is beneficial for Chinese enterprises to save costs and choose reputable institutions with good service to carry out certification.

Indirect cost includes the cost of inputs to improve forest management as well as consultancy fee paid to consultants, which vary greatly depending on the size of the enterprise, the readiness and seriousness of certification, the level of existing operations, and the nature of the major gaps. According to incomplete statistics, the investment of enterprises in improving forest management ranges

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from tens of thousands of yuan to more than 3 million yuan, and the cost of consultation varies from 20,000 yuan to more than 300,000 yuan.

Among the 75 questionnaires recovered, 32 were from forest operators. 28 of them have passed FSC forest management certification and 4 have not been certified yet. According to the response given by the 28 certified enterprises, only one enterprise has achieved remarkable benefit (profit increase more than 5%) and nine enterprises have achieved certain benefit (profit increase lower than 5%); the cost and the effectiveness is equivalent for one enterprise; the cost is higher than the effectiveness for 11 enterprises and the remained six enterprises said that the cost effectiveness cannot be expected. This indicates that the overall cost effectiveness of forest certification is unobvious at present. It is related to the certification time, certification purpose and the market change situation. The first batch of enterprises to carry out certification, such as Chuanghua Forest Farm, Baihe Forestry Bureau, Muling Forest Bureau and others, have stopped certification due to national policy reason, but good economic benefit has already been brought by certification. The certification benefit was obviously large than the cost. For example, the certification income of Fuling Forestry Bureau was then more than 1.5 million yuan while the certification cost was only about 500,000 yuan. But generally speaking, due to unfavorable increase of certification quantity and unfavorable enterprise export situation, most certified enterprises said that both the sales volume and income were decreasing year by year, which contradicts the rapid growth of the number of CoC certified enterprises in China.

#### **5.4.2 Economic impact analysis**

Combining with questionnaire survey, survey interview and cost-benefit analysis, the economic impact of FSC certification is mainly reflected in the following aspects.

--- **Improve brand value and corporate image.** The majority of forestry enterprises after certification have their reputation and environmental protection image significantly improved. Through presentations by non-governmental organizations, the media and case studies presented at seminars, as well as customer demand for certified wood or products, these companies successfully have their reputation improved. For example, after the certification of Muling Forestry Bureau, the feature programme “Muling Forest Certification” was broadcasted on Heilongjiang TV station, CCTV 7 and Shanghai World Expo. Publicizing and reporting were also made by Green Times and other news media of Heilongjiang Province, so that the reputation of the bureau has been greatly improved.

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**--- Stabilize and improve market share and realize market access.** Foreign orders, especially orders from Europe and the United States, usually require FSC certification. IKEA in China has also required its wood products suppliers to get FSC forest management certification. FSC certification has become the threshold to open the international market and to be a supplier of IKEA. Some enterprises have all their products supplied to IKEA. FSC certification can help such enterprise to stabilize and improve their market share.

**--- Promote optimal utilization of timber or products.** Many forestry enterprises carry out certification as raw material bases for processing enterprises, which has strengthened the connection between forestry enterprises and processing enterprises, ensured stable income and market and timber products, provided downstream processing enterprises with materials required by the international market and promoted the development of downstream enterprises. Fuyang Yongchang Bamboo Industry Management Association cooperated with Dahe Paper Company to provide Dahe with certified bamboo materials and primarily processed products. Although the economic income is not so obvious, it acquire stable orders and price which can ensure its normal operation and help to save labor cost. The state-owned forest farm of Shunchang County supports the development of two leading enterprises and support them to have their products sold far to European and American markets.

**---Other economic benefits.** Forestry enterprises have obtained financial and technical support from non-governmental environmental organizations and others to carry out certification, which has been mentioned in the motivation of enterprises to carry out certification. Some forestry enterprises have also been favored by international capital. In addition, it is emphasized in certification process to protect resources and saplings, improve added value of products, carry out diversified operation for diversified income, strengthen the development and sustainable utilization of non-wood forest products and avoid waste of forest resources, etc. For example, state-owned forest areas in the north have generally strengthened the development and management of wild economic plants and animals such as red pine fruit forests, wild vegetables, matsutake mushrooms, forest frogs, acanthopanax and grape, and plantations in the south have enhanced the undergrowth economy. In contrast, the financial incentive of FSC certification in this regard is not significant.



## 6. Problems and challenges for FSC forest management certification in China

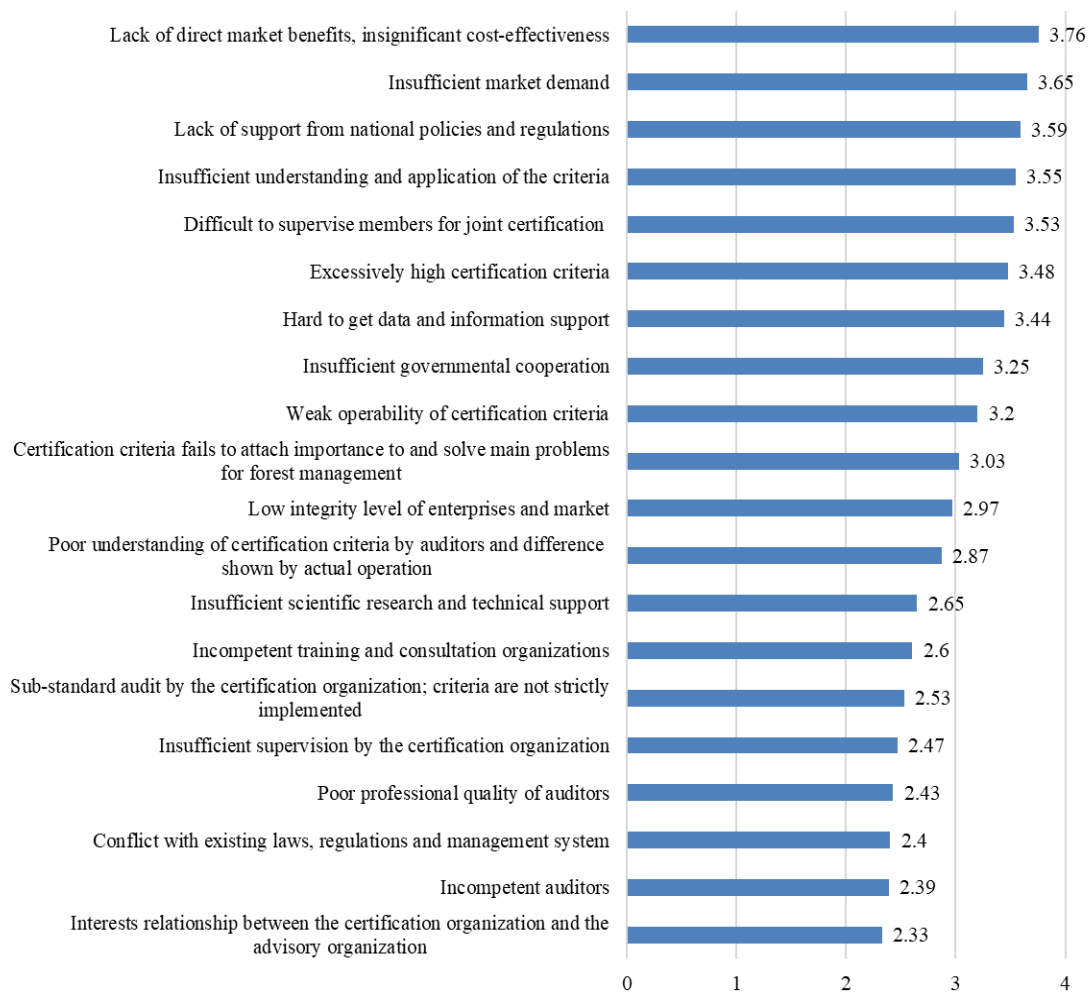
The impact and benefits of forest certification in China are restricted by various factors. Similarly, all shareholders have scored various problems from 1 point to 5 points based on the importance. With the benchmark of 3.5 points, if the score is more than 3.5 points, it means that the problem is quite obvious, vice versa. According to results of questionnaire survey for forest operators and all stakeholders, the scoring frequency and average for problems faced by forest management in China are shown in Table 10 below.

The average score is 3.01, indicating that there are some problems and challenges faced by FSC certification in China as a whole, but they are not significant. More intuitively, average scores given to problems and challenges faced by FSC certification in China are shown in the broken line graph (see Figure 22). It can be seen that the main problem and challenge faced by FSC certification in China is about certification motivation and certification preparation and implementation. There is also certain challenge for criteria formulation and application, certification audit and consultation as well as system operation and supervision.

**Table 10 Scoring Frequency and Average Score for Problems and Challenges Faced by China for FSC Forest Certification**

Challenges	1 point	2 points	3 points	4 points	5 points	Average
<b>(1) Certification preparation and implementation</b>	<b>35</b>	<b>33</b>	<b>81</b>	<b>66</b>	<b>85</b>	<b>3.44</b>
Insufficient understanding and application of the criteria	7	10	19	13	26	3.55
Hard to get data and information support	7	11	18	20	19	3.44
Insufficient governmental cooperation	11	5	28	16	15	3.25
Difficult to supervise members for joint certification	10	7	16	17	25	3.53
<b>(2) Criteria formulation and application</b>	<b>59</b>	<b>37</b>	<b>65</b>	<b>80</b>	<b>59</b>	<b>3.15</b>
Excessively high certification criteria	12	7	13	19	24	3.48
Weak operability of certification criteria	11	9	22	20	13	3.2

Certification criteria fails to attach importance to and solve main problems for forest management	14	12	17	22	10	3.03
Poor understanding of certification criteria by auditors and difference shown by actual operation	22	9	13	19	12	2.87
<b>(3) Certification audit and consultation</b>	<b>127</b>	<b>60</b>	<b>87</b>	<b>68</b>	<b>33</b>	<b>2.52</b>
Incompetent auditors	29	10	20	10	6	2.39
Poor professional quality of auditors	29	10	16	15	5	2.43
Sub-standard audit by the certification organization; criteria are not strictly implemented	24	12	23	7	9	2.53
Incompetent training and consultation organizations	25	14	10	18	8	2.60
Insufficient scientific research and technical support	20	14	18	18	5	2.65
<b>(4) System operation and monitoring</b>	<b>110</b>	<b>35</b>	<b>68</b>	<b>56</b>	<b>31</b>	<b>2.54</b>
Conflict with existing laws, regulations and management system	28	13	17	10	7	2.40
Interests relationship between the certification organization and the advisory organization	32	11	12	15	5	2.33
Insufficient supervision by the certification organization	30	4	22	14	5	2.47
Low integrity level of enterprises and market	20	7	17	17	14	2.97
<b>(5) Motivation and restriction of certification</b>	<b>22</b>	<b>16</b>	<b>49</b>	<b>66</b>	<b>72</b>	<b>3.66</b>
Insufficient market demand	7	6	16	23	23	3.65
Lack of direct market benefits, insignificant cost-effectiveness	6	6	13	25	25	3.76
Lack of support from national policies and regulations	9	4	20	18	24	3.59
<b>Subtotal</b>	<b>353</b>	<b>181</b>	<b>350</b>	<b>336</b>	<b>280</b>	<b>3.01</b>



**Figure 22 Ranking of Problems and Challenges Faced by Forest Management Certification Based on Average Scores**

Combining with the above questionnaire survey, interview with stakeholders, field survey and case study, forest certification in China generally has the following problems and challenges.

### 6.1 Insufficient motivation for certification

In general, Chinese forestry enterprises lack motivation to carry out certification mainly for the following reasons:

--- **Certification does not have obvious cost-effectiveness.** Based on survey results of certified enterprises, the certification has increased economic burden and management cost of forest management. For most companies, the direct and indirect costs of certification are quite high. At present, the certification has not brought obvious market benefits, which has greatly reduced the interest and enthusiasm of enterprises in forest certification.

--- **Insufficient market demands.** Although domestic consumers have

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increasingly higher environmental protection awareness in recent years, sustainability certification has just newly emerged in the domestic market. Due to insufficient promotion and other reasons, domestic enterprises and consumers do not know much about forest certification, and the demand for certified finished products is quite small. Although CoC certification carried out due to international market demand develops rapidly, most of these enterprises are export based processing enterprises, and some of them import certified timber from the international market. Even for certified processing enterprises, their certified products only account for a small part of all their products, so the overall promotion of forest management certification in China is limited. On the other hand, China's timber market has traditionally been a seller's market, and forestry companies are not worried about timber sales. Strict requirements of forest certification make them reluctant to be restricted by it. In particular, after the implementation of the Natural Forest Protection Project and due to the sharp reduction of timber output in northeast forests, the desire of forestry enterprises to seek certification decreased.

--- **Lack of national support by policies and regulations.** At present, there is lack of national specific policy to promote the development of forest certification. The guiding effect of the government's green procurement policy is not so favorable. Besides, due to competition, forestry authorities still hold a negative attitude towards the development of the international system FSC in China, which has also restricted the development of FSC in China.

## **6.2 Certification preparation and implementation**

Due to the gap of traditional forest management, Chinese forest management enterprises still have some difficulties in preparing for forest certification, which are embodied in the following aspects:

--- **Inadequate understanding and application of the criteria.** There is limited information on forest certification available for forest management units, so they are not clear about forest certification requirements, roles and procedures. As an international standard, FSC criteria introduces many new ideas and concepts which are quite different from traditional forest management concepts in China. In certification preparation process, most forest operators do not have sufficient understanding of certification criteria and do not know how to combine such criteria with enterprise management in practice. Therefore, they have to seek for support from external consultation organizations or technical service organizations. Sometimes, the forest management certification is promoted by processing enterprises which do not have adequate ability on forest management. As a result, the enterprise has to

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face many challenges both before and after certification.

--- **Hard to acquire data and information support.** During certification preparation, the forest management plan should be prepared. Then, the enterprises have to acquire data on resources, wildlife, fires, pests and diseases, environment monitoring and others. Without open access channels, the enterprises can hardly acquire such data. They may even need to spend a lot of manpower and material resources for survey and purchase, thus leading to the increase of certification cost.

--- **Difficult to supervise members for joint certification.**

In the south of China, there are mostly small-scale collective forests with dispersed forest rights. Joint certification is usually adopted. The management between the consortium and member units is quite loose. Members are mostly local farmers with limited knowledge, thus leading to difficulty for supervision of certified members and meeting requirements of criteria.

### **6.3 Criteria formulation and application**

Problems associated with criteria formulation and application include:

--- **The certification criteria cannot completely accord with China's national conditions and some certification criteria is excessively high.**

General FSC criteria are formulated without sufficient consideration of China's national conditions and without extensive consultation with stakeholders. As a result, many criteria or indexes can hardly be applied in China and cannot completely reflect characteristics of forest management in China so that evidences can hardly be collected. Some criteria are too high. The cost for the enterprise to meet such requirements is too high, which has increased certification difficulties. For example, during the survey, many certification organizations require that hard-headed boots, anti-cutting pants, work clothes, helmets, gloves, goggles, earmuffs, etc. should be configured for logging work according to the Regulations on Forestry Safety and Hygiene formulated by the International Labour Organization. But most forest management units think that some of the safety protection devices are not practical and can not play a protective role. The overalls are extremely inconvenient for production operation, the earplugs will affect the hearing and communication with the outside world, and the boots with hard head are too heavy and hot in the south, which may cause safety problems in the operation. Workers are actually not willing to wear them. Therefore, many enterprises spent a lot of money on safety devices as required by FSC, but these devices are just used for audit purpose. The new version of criteria proposes more flexible regulations.

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**--- Various certification organizations and auditors have inconsistent understanding on certification criteria.** During the practice of forest certification, it was discovered that different certification organizations or auditors have inconsistent understanding of criteria concept and requirements, thus leading to confusion of FSC certification in audit process. At present, controversial issues mainly include Chinese aborigines, the definition of natural forests and plantations, which forests can be converted into plantations, and the threshold and protection of high-value forests.

**--- Certification criteria and audit fail to emphasize main problems on forest management in China.** Some interviewees believe that the current forest certification fails to pay attention to or solve the main problems existing in China's forest management, such as the decline of forest quality, unreasonable logging mode and age-class, lack of medium and young forest management; single, unstable and unreasonable forest structure, etc.

#### **6.4 Certification audit and consultation**

Forest certification in China has a history of nearly 20 years. Some certification organizations recognized by FSC have established joint venture or wholly-owned companies in China and some selected to cooperate with local certification organizations and recorded at Certification Supervision Committee as the national certification authority. In general, after years of development, both certification organizations and auditors have improved their ability and experience, but there are still some incompetent auditors without sufficient experience and with poor professional quality. For example, some certification organizations fail to properly train and control the quality of their auditors, so that auditors are lack of adequate experience or ability. Auditors retained by some organizations even do not have forestry work or education background, which will greatly affect audit quality. Some auditors fail to profoundly understand the criteria. They may confused about criteria requirements, or be unfamiliar with local situations. They cannot combine criteria requirement with the enterprise's actual situation. They just apply criteria for audit mechanically. They emphasize the process and records while look down on forest management performance and results. FSC criteria is based on performance. If pays more attention to forest management performance rather than the process. Many certification organizations or auditors focus on “whether you have done” and whether you can provide relevant documented materials or records, but neglect actual effect.

Besides, along with market development, many forest certification training and consultation organizations have also been established in China to provide

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training, consultation services and technical support, which has also promoted the development of forest certification in China, but the training and consultation quality vary largely. At present, most consultation organizations were transformed from original ISO consultation organizations. They inherit many contents of ISO management system but are lack of forestry background and professional knowledge. Then, they just apply many management system documents and templates mechanically to forestry enterprises. These documents cannot be well combined with the enterprise's production practice and can hardly be operated. They even cause additional burden to enterprises. As a result, forestry enterprises cannot fully understand criteria requirement or operate according to such criteria, which has affected the improvement of forest management and the certification effect.

### **6.5 System operation and supervision**

FSC operates in China as an international forest certification system, which is different from China's management system. Problems in system operation and supervision include:

**--- Coordination with laws, regulations and existing management systems.**

The certification criteria conflicts with some forestry policies or laws and regulations. At present, possible contradicts found in forest certification audit include that FSC requirements on the conversion of plantation differ from relevant provisions of China due to different definition of plantation, the high conservation value forest is not consistent with the classified management system of China, there is potential conflict between China's policy to encourage conversation of low-yield forest and prohibition of FSC certification to convert natural forests into plantation.

**--- Commercial operation and credibility of certification organizations.**

Certification organization should cooperate with the certified forestry enterprises and collect audit fee to maintain its operation and make profit. To some extent, the competition among certification organizations can reduce the cost of certification and relieve the burden of forestry enterprises, but their commercial operation also makes them likely to violate rules and commitments, lower the criteria and ignore the quality of audit in practice. In the process of market operation, some organizations pack certification and consultation together based on the interest relationship between the certification organization and the consultation organization and make guarantee for being certified, which may affect the fairness and credibility of audit results.

**--- Enterprise and market integrity.** From the interviews of all parties and the

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audit process of the certification organization, it is also found that some forestry enterprises also deliberately conceal or falsify the situation. They failed to provide relevant evidence according to the truth, or exaggerated or concealed their work. What's more serious is that due to quarterly restrictions, the supply of certified timber in non-cutting season is limited, or the transportation cost is quite high. Then, some certified forestry enterprises colluded with processing enterprises to provide false invoice for processing enterprises for certified products, which has seriously disturbed the market of certified products. Besides, some CoC certified enterprises also have problems in operation. Since certified timber or raw materials are generally expensive, or due to high transportation cost for geological reason or seasonal supply of certified timber, some certified enterprises only purchase a very small part of certified timber in order to acquire CoC certification. Non-certified timber is taken as certified timber or they may buy FSC log invoices. Then, their sales of certified products are much larger than the purchase quantity of certified raw materials. They took measures to avoid audit and supervision of certification organizations. Therefore, the purchase amount of certified timber is lower than the actual needed quantity, which has caused disorder of the certification market and affected overall reliability of forest certification in China.

## **7. Conclusions and Suggestions**

### **7.1 Conclusions**

Through analyzing NCs of certification reports, questionnaire survey, interviews with important stakeholders and field visits to certified forestry enterprises, this study comprehensively and systematically evaluates, summarizes and analyzes the motivation for forestry enterprises in China to carry out certification, the field impact of forest certification, the impact of macro forestry policies and existing problems. Based on research in this report, it can be concluded that:

**(1) The development of the international green market and the support of all parties have played an important role in promoting the development of FSC certification.** The demand for certified products in the international market has promoted export-oriented furniture enterprises and wood processing enterprises in China to carry out CoC certification for forest products, thus promoting the development of FSC forest management certification in China. The changes of market policies in developed countries such as Europe and America, as well as the encouragement and promotion policies formulated by relevant parties have played a very important role in the



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cultivation of certified product market and the development of forest certification. The main motivations for Chinese enterprises to carry out forest management certification are acquiring international access, improving corporate image, building brand image in the industry, improving corporate competitiveness and reputation, acquiring or expanding market share and other direct market benefits. Indirect market benefits, such as improving enterprise management level, performing corporate social responsibilities, and the support and promotion of external organizations have also played a certain role.

**(2) There is still some gap for enterprises for forest management certification.** Based on NCs provided by certification organizations, there is still some gap for Chinese forestry enterprises with regarding to employee's health and safety, CoC, the forest management plan, forest monitoring contents and system construction, soil and water resource protection, waste treatment and environment impact assessment. More efforts should be made by Chinese forestry enterprises for improvement.

**(3) Forest certification has had multiple positive impacts on sustainable forest management in China.** In forest certification process, Chinese forestry enterprises have made a lot of efforts and improvements, and forest management certification has affected society, environment and forest management significantly, but economic benefits brought by it to enterprises are not so obvious. For society, certification helps for protecting rights and interests of employees and workers of forestry enterprises, including their wages, welfare and living conditions, health and safety status, and their participation in the enterprise's operation decisions. It has improved the relationship between the certified enterprises and the local communities. For environment, forest certification has reduce negative environmental impact of forest management, strengthened the protection of soil, water resources, biodiversity and high conservation value and improved environmental service functions of forests. In terms of forest management, the certification has improved the forestry enterprises' awareness and ability for sustainable forest management, promoted the implementation of national laws and regulations on forest and other related aspects, strengthened the compilation of the forest management plan and the establishment and implementation of the forest monitoring and assessment system, and improved forestry enterprises' management system. In terms of economy, the certification has brought certain economic benefits to the certified enterprises, stabilized product market, promoted the development of downstream processing enterprises and improved the corporate image.

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**(4) Forest operators and certification stakeholders have different understanding on the impact of the certification.** Forest operators scored higher than stakeholders (including certification organizations, processing enterprises, research and education institutions, forestry authorities, non-governmental organizations, and consulting institutions) on the indicators of motivation and impact of certification. There was a significant difference in understanding between the two. In addition to subjective factors, forest operators, as direct participants in the process of forest certification, do more work and efforts than other stakeholders. Many work and effects are not observed by stakeholders so as to be ignored. A few people believe that forest certification just has small substantial contribution to promote forest management in China, but is a business mean for enterprises to meet market demands.

**(5) There are still some problems and challenges restricting the effectiveness and development of forest certification.** At present, there are still many problems for forest certification in China which have affected the development and effectiveness of forest certification, including the lack of indirect market interests, insignificant cost effectiveness, insufficient market demand motivation, insufficient understanding and application ability of criteria, difficulty to supervise members for joint certification, etc. There are also many challenges for criteria formulation and application, certification audit and consultation and system operation and supervision. All parties should make joint efforts to overcome these problems. Certification impact or effect are affected by the recognition of certification criteria, the certification organizations' audit quality and reliability, cost effectiveness, market development degree of the certified product, roles of the government and other factors.

## **7.2 Suggestions**

In light of the impact and benefit of forest certification in China as well as encountered problems and challenges discovered by above studies, the following opinions and suggestions are hereby proposed in order to further promote the development of forest certification in China and give full play to the role and benefit of forest certification.

### **7.2.1 Training on forest certification and technical support should be strengthened**

In terms of forest certification, there are still many technical difficulties in consultation with stakeholders, environmental impact assessment, forest

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monitoring, the formulation and implementation of the forest management plan, the judgment and protection of high conservation value and others which should be solved by Chinese enterprises. Scientific research institutions and technical consulting institutions should strengthen the research on these technical difficulties and provide practical technical support and consulting services for enterprises to carry out certification. FSC should also promptly issue guidance or technical guidelines on these difficulties, and carry out relevant capacity building to help enterprises better cope with these challenges.

### **7.2.2 Domestic and foreign markets for certified products should be cultivated**

Forest certification is a kind of market mechanism. If enterprises applying for forest certification cannot recover the certification cost and acquire benefits from certification, the sustainable development of forest certification will inevitably be affected. The development of the market for certified products is the key. Domestic market for certified products has not yet been formed. It is necessary to actively promote the market for certified products in China, including market research and market promotion, promoting market understanding on certified products, especially understanding of consumers, retailers and forestry enterprises so that certified forest products can be finally accepted by consumers. In this way, forestry enterprises can have real motivation to carry out forest certification. Effective market linkage should also be established between timber processing enterprises and forest operators. Then, processing enterprises can promptly get to know domestic certification trend and development and purchase qualified raw materials that have been certified. Forest management enterprises can get to know demand of related enterprises and the market, actively carry out certification and meet demands of enterprises on certified timber.

### **7.2.3 Coordination among various parties and cohesion of national policies should be strengthened**

FSC, as an international system, should cooperate with domestic certification, forestry industry and market competent authorities, make effort to associate with national policies on forestry industry, climate change and others, seek for the mode of joint development with the national forest certification system of China and jointly promote sustainable forest management in China and the development of the market for certified products.

### **7.2.4 The supervision of forest certification should be strengthened**

In view of some problems in the current certification process, the approval and

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supervision of certification organizations and enterprises should be strengthened. A more effective certification supervision and management mechanism should be established to strengthen the supervision of certification organizations and certified enterprises and to impose strict punishment measures against illegally operating enterprises or certification organizations. Both FSC and national competent authorities should improve the qualification examination and registration system for forest certification auditors and strengthen training of auditors.

### **7.3 Discussions**

This study assessed the impact of FSC certification on sustainable forest management in China by means of analyzing non-compliances proposed by certification organizations in the audit report, questionnaire survey, interview with stakeholders, field survey and other comprehensive approaches, trying to be objective, fair and comprehensive. However, generally speaking, these research approaches still have certain limitations. First, the analysis of non-compliances in audit reports emphasizes that forest operators have rectified non-compliances detected by audit, but endeavor and improvement made by forest operators in certification preparation process have not been analyzed. Second, interview of stakeholders and questionnaire survey have generally got to know views of stakeholders on the impact of the certification, but have been inevitably affected by subjective factors of various parties. Third, these approaches describe “efforts” and “endeavors” made by enterprises in FSC certification process, and failed to evaluate the actual forest management performance, such as measurable impact on biodiversity, water and soil loss, health and safety of employees, environmental value and others. Namely, mainly “actions” of enterprises rather than “results” or “performance” have been evaluated. Therefore, reasonable monitoring indexes and methods should also be established to evaluate performance of forest certification impact and then, long-term system monitoring and research should be carried out.