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Innovation in Bio-disaster Prevention and Control Mechanism after Forest Tenure Reform at County Level

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Abstract Taking Youxi County of Fujian Province as an example, the author introduced basic situations of new bio-disaster prevention and control mechanism for forest resource protection and social service works after the forest tenure reform. Then, the author analyzed new problems faced by bio-disaster prevention and control in forestry. Finally, the author present the existing problems of bio-disaster prevention and control at the county level from five aspects: innovating upon plant quarantine management mechanism; innovation upon survey methods and service modes of bio-disaster monitoring; strengthening and improving construction of bio-disaster monitoring and forecasting network; innovating upon management system for bio-disaster prevention and control; speeding up construction of service system for social prevention and control of bio-disasters.

Key words Forest tenure system, Reform, Prevention and control of bio-disasters in forestry, System and mechanism, Innovation

1 Introduction

With constant deepening of the reform of collective forest tenure system, there has been a great change in rural operating system. Also, the subjects responsible for prevention and control of bio-disasters have been changed to operators from village collectives. In this situation, the original bio-disaster prevention and control system and mechanism have become not suitable for current forestry production and development. Therefore, it is a great task for governments at all levels and forest protection workers to explore and study new mechanism, method and model of bio-disaster prevention and control after the reform of forest tenure system. By taking Youxi County as an example and in combination of actual works of forest protection and social services for forestry in this County, this study discusses new mechanism for prevention and control of forestry bio-disasters at county level, in the hope of providing references for establishing new system and prevention for bio-disasters after the reform of forest tenure system.

2 Basic information of forestry and forest tenure reform in Youxi County

As one of the 48 key forestry counties in China's southern collective forest zone, Youxi County is determined by the State Forestry Administration as a pilot county for the reform of forestry property system in the collective forest zone. In Youxi County, the forest land covers a total area of 279 000 hm² and the forest area is up to 249 900 hm², including 20.77 hm² commercial forest (accounting for 74.4%), 71 300 hm² ecological public welfare forest (accounting for 25.6%). Among the for-

est land, the collective forest land covers an area of 221 000 hm², accounting for 86.4%. In 2003, Youxi County launched the reform of collective forest tenure system in an all-round way, and completed 93.3% of the task of collective forest tenure reform. The reform of collective forest tenure system has promoted the establishment of new mechanism for forestry development, strengthened the ability of forestry sustainable development, optimized resource allocation, increased village collective and forest farmers' income, and fostered transformation of government functions. Thus, it is deemed as an important reform for social and economic development in collective forest zone^[1].

3 Preliminary establishment of new protection system for forest resources after the reform of forest tenure system

After the reform of collective forest tenure system, deep changes happen in rural society of Youxi County, such as new pattern of diversified forest tenure structure, diversified operation forms, as well as scattered subjects of forest tenure. To adapt to new situations after the reform of forest tenure system, Youxi County has preliminarily established new protection system for forest resources.

3.1 Innovating upon "three prevention systems" for forest protection On the principle of "farmers' founding, management, monitoring and obtaining benefit", Youxi County guided forest farmers and forestry producers and operators to voluntarily combine, formulate articles of associations, and collect membership fees, to establish the mass forest resource joint prevention association with clear-cutting prevention, forest fire prevention and bio-disaster prevention as major parts, and the association as a carrier, to significantly improve the level of mass prevention and control and establish new forest resource

protection system. At present, the whole county has set up one federation of joint forest protection association and 93 joint forest protection associations, holding 1 440 members, involving 193 village committees, with the area of joint forest protection up to 126 000 hm².

3.2 Establishing the administrative law enforcement brigade for forestry In May, 2005, Youxi County Forestry Bureau formally established the administrative law enforcement brigade and selected excellent people with license of administrative law enforcement of forestry. Besides, it dispatched administrative law enforcement squadron to each forestry station, and launched forestry administrative law enforcement works, including inspecting plant quarantine certificate, and investigating cases of violating against forest protection quarantine laws and regulations in accordance with townships. The establishment of forestry administrative law enforcement brigade further strengthens administrative law enforcement, makes clear enforcement subjects, standardizes procedures of law enforcement, puts into effect of law enforcement, perfects safeguarding mechanism of law enforcement and boosts efficiency of administrative law enforcement in forestry.

4 Constant improvement in forestry social service system after the reform of forest tenure system

(i) It establishes and improves 96355 Service Hotline Center for the entire forestry. In August, 2004, Youxi County Forestry Bureau established 96355 Service Hotline for forest farmers, and set up the Public Service Hotline Center with participation of relevant departments of the Forestry Bureau, to provide technical consultation for farmers about forestry laws, regulations, policies and prevention and control of forestry bio-disasters. (ii) It establishes the forestry service center. In April, 2005, Youxi County founded the forestry service center. By now, it has established 14 branch centers in forestry stations. Each service center (and branch center) is provided with forest plant quarantine stations and assigned with full-time quarantine officers. The service center carries out forest plant allocation, transportation and quarantine works as per townships. (iii) It improves forestry sci-tech extension network. Youxi County has further improved the forestry sci-tech extension network with the county's sci-tech extension center as the core, and township forestry stations and village forestry technicians as the link-up, and forestry enterprises, and model forest farmers as carriers. The whole county has engaged 252 village-level forestry technicians, which strengths training, extension and popularization of forestry science and technologies and practical skills, and improves sci-tech quality of forestry producers and operators^[2].

5 New problems in prevention and control of forestry bio-disasters after the reform of forestry tenure system

The old forestry bio-disaster prevention and control working

system and mechanism are established on the basis of old forest tenure system. In the past, the forest tenure in Youxi County is owned by village collective and the state. Prevention and control works of forestry bio-disasters are assigned to village collectives and the state-owned forestry organizations. In this situation, grass-root organizations will carry out forestry bio-disaster prevention and control works under the guidance of business segments. However, after the reform of forest tenure system, the forest tenure that accounts for 86.4% of the county's forest land is owned by forest farmers. Then, business segments will have great difficulty in carrying out those works. As a result, there comes a series of problems, such as the bio-disaster prevention and control being incompatible with existing laws, policies, grass-root systems, teams and technologies, etc.

5.1 Imperfect forestry bio-disaster monitoring and forecasting network In the three-level (county, township and village) forestry bio-disaster monitoring and forecasting network, Youxi County is extremely weak at the village level. It fails to establish a real village-level contact system for bio-disaster monitoring and investigation, which are undertaken by a part-time predictor of the forestry station. After the reform of forest tenure system, farmers have become subjects responsible for operation of contracted forest land. Nevertheless, they neither need assuming duties and responsibilities for disaster investigation, nor need bearing any investigation cost. Such practice is still the mode prevalent in the period of planned economy, so it fails to bring into play functions of huge numbers of forest operators. In 2008, Youxi County issued *Rules for Implementing Management Methods for Forestry Bio-disaster Monitoring and Forecasting (for Trial Implementation)*, in which Article 11 specifies that villages (working areas and operating areas) should be assigned with liaison person for monitoring and forecasting forestry bio-disasters and assisting the part-time predictors in investigating forestry bio-disasters. Unfortunately, due to fund and management reasons, there is still not real arrangement of such liaison person at village level.

5.2 Imperfect laws and regulations for prevention and control of forestry bio-disasters The *Forest Law, Regulations on the Prevention and Control of Forest Plant Diseases and Insect Pests, and Regulations on Plant Quarantine* are major legal weapons for carrying out forestry bio-disaster prevention and control. However, these laws or regulations are formulated at the background of planned economy, not suitable for bio-disaster prevention and control after the reform of forest tenure system, and need revising as soon as possible, to solve the problem of no legal basis for related administrative permit and administrative function arrangement. For example, Paragraph 2 of Article 72 of *Regulations on the Prevention and Control of Forest Plant Diseases and Insect Pests* states that it is forbidden to use those tree seedlings that have hazardous plant diseases and insect pests. However, there is no basis for punishing those who haven't obtained the Certificate of Plant Quarantine and the Inspection Certificate of Origin; the *Regulations on Plant Quarantine* only requires approval of application for

quarantine inspection for transporting plant (and plant products) between provinces, while there is no such provision on transportation within the same province. Then, it will create difficulty for law enforcement of quarantine.

5.3 Greater difficulty in administration of forestry bio-disaster prevention and control Along with diversification of operation subjects and modes, the situation of government-leading forestry bio-disaster prevention and control has changed^[3]. Most forest farmers and operators are not aware of harmfulness of forestry bio-disasters. In addition to some individual operators' pursuit of profit, it is very difficult for forest quarantine authorities to organize and coordinate prevention and control in administrative way. If the County's Forest Seedling Management Station does not supply seedlings, forest farmers and operators don't know where the seedling station and forestry station are situated, let alone the guidance on production skills, inspection and acceptance of seedling quality, as well as the origin quarantine works. Increase in forest farmers' autonomy, influence of market on supply and demand of seedlings, and weak awareness of some forest farmers in improving forest seedlings, create much greater difficulty in law enforcement of seedling quarantine^[4].

5.4 The ability of forestry bio-disaster prevention and control not suitable for actual prevention and control requirements The forestry bio-disaster prevention and control requires high skills and certain specialized ability, which are not easily grasped by every forest farmer. After the reform of the collective forest tenure system, mountain forest is scattered in thousands of farmers, and there are great changes in production mode and organization form, presenting the situation of "single family or individual household" operation of forestry. As is known to all, single family or individual farmer have huge difficulties in facing complex mountain areas, remote road, high and dense trees, shortage of water, as well as suddenness of forestry bio-disasters. Thus, the prevention and control concept, facility, means, and technologies, as well as forces, are not suitable for actual demand. It is true that Youxi County has been innovating upon forestry operation and management mechanism after the reform of forest tenure system. However, due to special characteristics of forestry bio-disaster prevention and control, the association pilot and social prevention and control mode are still at the early stage; low level of prevention and control; low marketization level; weak prevention and control capacity; lack of practical experience.

6 Innovating upon system and mechanism for forestry bio-disaster prevention and control compatible with the reform of forest tenure system

As an integral part of forestry works, the forestry bio-disaster prevention and control takes the responsibilities of protecting forest resources, maintaining ecological safety, pushing forward ecological construction, and promoting ecological civilization, so it is an important force for guaranteeing forestry de-

velopment. Youxi County should constantly innovate upon system and mechanism for forestry bio-disaster prevention and control through focusing on the reform of collective forest tenure system, to suit new trend after the reform of forest tenure system. The prevention and control of forestry bio-disasters at least include three parts, namely quarantine and disaster forecasting, monitoring, and disaster control and relief.

6.1 Innovating upon mechanism for management of forestry plant quarantine Forestry plant quarantine work is an important constituent part of forest protection work and also a sacred duty granted to forest quarantine authorities by laws and regulations. In the past, the functions and responsibilities of forest quarantine authorities focus on the guidance, organization and implementation of specific prevention and control work of forestry bio-disasters, thus generally lacking the recognition and consideration of quarantine authorities as an first-level authority for the management of social public affairs. To strictly enforce laws of quarantine after the reform of forest tenure system, forest quarantine authorities in Youxi County should focus on administrative enforcement of laws, rather than on providing services for prevention and control technologies. Besides, they should take prevention and elimination measures to effectively stop invasion of foreign hazardous forestry harmful organism. After the reform of forest tenure system, forest departments should be relieved from heavy forest culture and protection works in the past, and turn their major works to administrative enforcement of laws, public services, guidance and assistance^[6]. The County's forest competent authorities should determine functions and responsibilities of the current grass-root forest organizations, and incorporate the supervision of seedling production and operation, circulation of forest plant, forest resource protection, production guidance and disaster prevention and control, as well as social services into their major functions and responsibilities. In addition, they should further improve the quarantine registration system, and strengthen the quarantine supervision of forest seedling, flowers, pine varieties, and other plant products. Forest quarantine laws and regulations should further formulate administrative punishment for those who haven't obtained the Certificate of Plant Quarantine and the Inspection Certificate of Origin for transporting seedlings within the county or for growing seedlings, or afforestation.

6.2 Innovating upon methods and service modes for forestry bio-disaster monitoring and investigation For forestry bio-disaster monitoring and investigation, it must change the practice of forecasting forestry bio-disaster occurrence of all mountain regions in the whole county and implementing down to the forest teams and land pieces. Since forest area is huge, its distribution is wide, in addition to complex mountain areas and many varieties of forestry bio-disasters, it is impossible to complete these tasks relying only upon few predictors in forest authorities at county and township levels. As a result, it often leads to lightly touching on forestry bio-disasters in the prediction report, which will influence the prevention and control of bio-disasters. To reduce monitoring and investigation works of forest authorities, the Forestry Bureau may increase certain

number of monitoring stations in different townships and villages, for example 20 to 30 stations, sign forestry bio-disaster monitoring contract with predictors at forestry stations, making clear the monitoring scopes and contents, investigation methods, report system, monitoring record, and investigation subsidy, etc. Predictors at the County's forest quarantine station may forecast occurrence time, degree and trend of major forestry bio-disasters on the basis of data obtained through monitoring and investigation and in combination with analysis of meteorological data. Also, they should announce the prediction information on local TV station, government website or through mobile phone short message platform. It is expected to provide forest farmers with real decision-making power in operation and management after the reform of forest tenure system. The State Forestry Administration should properly adjust its examination method for monitoring accuracy of local forestry competent authorities.

6.3 Strengthening and improving the network construction for forestry bio-disaster monitoring and prediction

To do well in forestry bio-disaster monitoring and early warning at county level, it must abandon the practice of relying only on county, township and station predictors in the period of planned economy. Specifically, it is proposed to cultivate village-level liaison people among forest technicians, operators and forest rangers, take forest technicians in every villages as forest protectors and responsible for technical training of liaison people, professional guidance and contacting liaison people. Also, it should set up the monitoring and early warning network covering townships (stations) and villages (work areas), to reduce investigation work of predictors, and realize "comprehensive monitoring, timely pre-warning, and accurate forecasting".

6.4 Innovating upon forestry bio-disaster prevention and control management system

Youxi County should improve the forestry bio-disaster prevention and control management system, and establish an input mechanism with inputs of governments at all levels as major parts for bio-disaster prevention and control and administration of quarantine of major hazardous and harmful organism, with inputs of forest operators as major parts for prevention and control of commercial forestry bio-disasters, and with subsidy of governments at all levels as auxiliary parts^[7]. For commercial forestry bio-disaster prevention and control, forest authorities should conduct wide propaganda and comprehensive guidance, and never force forest operators to take prevention and control measures. Only when it will influence safety of other adjacent forest and ecological public welfare forest or there is occurrence of forestry bio-disasters like nematodiasis, may it need ordering them to eliminate the disaster in accordance with provisions of *Regulations on the Prevention and Control of Forest Plant Diseases and Insect Pests*. Although forestry bio-disasters are natural disasters^[8], the punishment of those who fail to observe prevention and control of forestry bio-disasters is artificial. For those who violate against related laws and bring losses to forest and ecological public welfare forest of other owners, it should impose punishment or bring lawsuit in accordance with *Regulations on the Prevention*

and Control of Forest Plant Diseases and Insect Pests.

6.5 Speeding up the construction of social service system for forestry bio-disaster prevention and control To suit the demand for prevention and control of forestry bio-disasters after the reform of forest tenure system, the forest competent authorities and forest protection organizations should strengthen management and guidance in the construction of joint forest protection association through the federation of joint forest protection association^[9], and further bring into play functions of the association in prevention and control of forestry bio-disasters. It is proposed to actively foster social service forces, push forward diversified, market-oriented and profession-targeted social services, which is the direction and inevitable choice for the development of forestry bio-disaster prevention and control undertaking. Youxi County can cultivate forest doctors through policy guidance, material encouragement, and technical support, and participate in the prevention and control of forestry bio-disasters in the form of professional prevention and control companies, professional teams, forest hospitals, and tree doctors, etc^[10]. Besides, it can strive for subsidy scope of medical instruments and monitoring facilities for forestry bio-disasters. From 1987 to 1989, Sanming City of Fujian Province had accumulated much precious experience from establishing the Light-duty Aircraft Team for Sanming's Forestry Services^[11]. Learning from this experience, Youxi County may speed up the mechanization and modernization construction in forestry bio-disaster prevention and control as per the demand for modern forestry construction, to improve the efficiency of prevention and control.

References

- [1] LIN JY, CHEN QQ, LIN MT. Practice and effect of collective forest right system reform in Youxi County[J]. Journal of Fujian Forestry Science and Technology, 2005, 32(4): 183–187. (in Chinese).
- [2] ZHAN ZR. Discussion on new type forestry scientific service system construction after forestry ownership reform[J]. Forest By-Product and Speciality in China, 2007(5): 87–89. (in Chinese).
- [3] WANG ZX. On China forest culture and double-increasing goal of forest resource in 2020[J]. Forestry Economy, 2010(4): 3–4. (in Chinese).
- [4] ZHAN ZR. Practice and effect of forestry harmful biological seed without risk propagation base construction[J]. Forest Pest and Disease, 2007, 26(4): 40–42. (in Chinese).
- [5] SONG YS. On modern forest pest management[J]. Forest Pest and Disease, 2010, 29(4): 40–44. (in Chinese).
- [6] The Thirty – fifth Seminar of Chinese Communist Party School of State Forestry Administration. Essence of the collective forest tenure reform—The report of study tour in Fujian Province[J]. State Academy of Forestry Administration Journal, 2010(1): 17–20. (in Chinese).
- [7] WANG WL, ZHANG WQ, LIU WP, et al. Establish the investment mechanism in prevention and cure of Fujian forest disasters[J]. Problems of Forestry Economics, 2002, 22(6): 348–350. (in Chinese).
- [8] LIU YG, LI TS. Regional classification and environment assessment of natural disasters in Shaanxi[J]. China Population Resources and Environment, 2005, 15(2): 61–64. (in Chinese).
- [9] GAO XF, SONG WM. Thoughts about strengthening forestry association[J]. Forestry Economy, 2010(2): 92–96. (in Chinese).

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- [17] ONKAL-ENGİN G, DEMİR İ, HİZ H. Assessment of urban air quality in Istanbul using fuzzy synthetic evaluation[J]. *Atmosphere Environment*, 2004, 38(23): 3809–3815.
- [18] WU W, TANG MH, LIU HB. Fuzzy comprehensive evaluation of soil nutrients[J]. *Journal of Southwest Agricultural University*, 2010, 22(3): 270–272. (in Chinese).
- [19] WANG JG, YANG LZ, SHAN YH. Application of fuzzy mathematics in soil quality evaluation[J]. *Acta Pedologica Sinica*, 2001, 38(2): 176–183. (in Chinese).
- [20] DUAN YH. Application of fuzzy comprehensive evaluation in soil environment quality assessment[J]. *System Sciences and Comprehensive Studies in Agriculture*, 2004, 20(4): 303–306. (in Chinese).
- [21] ZHANG X, CHEN YL. Soil quality evaluation in Dongtinghu Lake based on fuzzy mathematics and GIS[J]. *Land & Resources Herald*, 2006(3): 148–151. (in Chinese).
- [22] SHI XC, QIAN Y, XIONG JX. Application of fuzzy mathematics models in the evaluation of soil heavy metal pollution[J]. *Chinese Journal of Soil Science*, 2006, 37(2): 334–336. (in Chinese).
- [23] YIN BH. Study on basic soil fertility evaluation in county level in project of formula fertilization by soil testing[J]. *Journal of Anhui Agricultural Sciences*, 2008, 36(15): 6389–6391. (in Chinese).
- [24] WANG JH, LU XG, JIANG M, *et al.* Fuzzy synthetic evaluation of wetland soil quality degradation: a case study on the Sanjiang Plain, Northeast China[J]. *Pedosphere*, 2009, 19(6): 756–764.
- [25] ZHONG XL, ZHOU SL, LI JT, *et al.* Spatial variability of soil heavy metals contamination in the Yangtze river delta—a case study of Taicang City in Jiangsu Province[J]. *Acta Pedologica Sinica*, 2007, 44(1): 33–40. (in Chinese).
- [26] ZHAI H, LU WX, YANG W, *et al.* Application of fuzzy mathematics and contamination index method to evaluation of soil heavy metals pollution[J]. *Soils*, 2008, 40(2): 212–215. (in Chinese).
- [27] PAN F, LIANG C, FU Q. Application of matter element model based on stratification analysis method in soil quality evaluation[J]. *Research of Agricultural Modernization*, 2002, 23(2): 93–97. (in Chinese).
- [28] SHI JJ, MENG HL, GAN DQ. The matter-element model on agricultural evaluation of soil quality[J]. *System Sciences and Comprehensive Studies in Agriculture*, 2005, 21(1): 20–23. (in Chinese).
- [30] KRUSKAL JB. Linear transformation of multivariate data: theory and application in the behavioral science[M]. New York and London: Seminar Press, 1972.
- [31] FRIEDMAN JH, TUKEY JW. A projection pursuit algorithm for exploratory data analysis[J]. *IEEE Trans Computers*, 1974, 23: 881–889.
- [32] FU Q, WANG ZL, LIANG C. Applying PPC model based on RAGA in evaluating soil quantity variation[J]. *Journal of Soil and Water Conservation*, 2002, 16(5): 108–111, 145. (in Chinese).
- [33] FU Q. Study on the PPE model based on RAGA to classify the county energy[J]. *Journal Systems Science and Information*, 2004, 2(1): 73–82.
- [34] ZHAO XY, FU Q, XING ZX. Application of projection pursuit grade evaluation model in comprehensive evaluation of changes in soil quality[J]. *Acta Pedologica Sinica*, 2007, 44(1): 164–168. (in Chinese).
- [35] NIE Y, ZHOU Y, ZHU HY. Research on cropland resource evaluation based on GIS and PSR model[J]. *Journal of Soil and Water Conservation*, 2004, 18(2): 92–96. (in Chinese).
- [36] JIANG ZL, SHA JM, YANG WN, *et al.* Multiple factors –based remote sensing evaluation of ecological environment in Fuzhou[J]. *Remote Sensing for Land & Resources*, 2004, 61(3): 46–48, 60. (in Chinese).
- [37] YAN SQ, MENG QF, DONG SQ, *et al.* Comprehensive evaluation of geologic environment based on GIS in Dezhou[J]. *China Mining Magazine*, 2004(5): 17–19. (in Chinese).
- [38] LIU N, LI XJ, ZHAO GX, *et al.* Evaluation of soil quality in the Yellow River Delta based on GIS[J]. *Chinese Journal of Soil Science*, 2006, 37(6): 1053–1057. (in Chinese).
- [39] YUAN CJ, ZHU HS, HE TB, *et al.* Study on agricultural land suitability evaluation in Karst mountain area based on GIS—Case on Qianxi County, Guizhou Province[J]. *Journal of Mountain Agriculture and Biology*, 2008, 27(2): 152–156. (in Chinese).
- [40] LV QL, FU QL, WU KN, *et al.* Studies on the comprehensive evaluation on fertility and spatial distribution of the soil in the suburb of Zhengzhou[J]. *Chinese Agricultural Science Bulletin*, 2006, 22(1): 166–168. (in Chinese).
- [41] WANG F, XING SH. Evaluation of the suitability of land resources for spring peanut in Fujian Province on GIS platform[J]. *Chinese Journal of Eco-Agriculture*, 2008, 16(2): 475–481. (in Chinese).
- [42] WANG JW, LI RA, LU H, *et al.* GIS-assisted vegetable land soil environment quality assessment and class at large scale[J]. *Journal of Zhejiang University: Agriculture & Life Sciences*, 2004, 30(2): 173–178. (in Chinese).
- [43] SHI CY, ZHOU HZ. Evaluation of land quality based on GIS—a case study on paddy field in Suzhou[J]. *Acta Pedologica Sinica*, 2001, 38(3): 248–254. (in Chinese).
- [44] LI SY, LIU HY, ZHANG XD, *et al.* Spatial variability of soil fertility quality indices in northeast China[J]. *Chinese Journal of Soil Science*, 2006, 37(2): 220–225. (in Chinese).
- [45] CHENG JN, ZHAO GX, ZHANG ZX, *et al.* GIS supported comprehensive evaluation of cultivated land quality at small scale—a case study in Dingzhuang Town of Shandong Province[J]. *Journal of Natural Resources*, 2009, 24(3): 536–544. (in Chinese).

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- [10] ZHAO RX, WANG YL. Reform and practice of social prevention and treatment for forestry harmful creatures in Liaoning Province[J]. *Forest Pest and Disease*, 2010, 29(3): 44–46. (in Chinese).

- [11] HUANG BR. Applied status and developmental countermeasures of controlling forest disease and insect pests with (super) light-type planes in Fujian Province[J]. *Journal of Fujian Forestry Science and Technology*, 2002, 29(4): 79–83. (in Chinese).

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