Small-Scale Environmental Impact Assessment in Japanese Private Industrial Forest − A SWOT Analysis Based on Risk Management Processes

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Abstract

Environmental impact assessment (EIA) has been an established measure to mitigate environmental risks in various larger construction projects around the world. In Japan, the management of private industrial forest is highly dependent on governmental financial stimulus which has led to a planned top-down management scheme guided by the Ministry of Agriculture, Forestry and Fisheries. However, the identification, prediction, evaluation, and mitigation of potential environmental hazards due to human action in forest ecosystems in Japan is currently not a component within the scope of management of local private industrial forest. The purpose of this study is to analyze the potential of implementing the recently established Japanese forester system into the collaborative risk management process of Local Expert Risk Mediation (LERM) for the possibility to introduce environmental impact assessment at a l-scale in local private industrial forest. A grounded-theory approach was conducted by collecting qualitative data from local forest officials. It was found that at the current time activities by foresters are usually limited to enhancing the efficiency of roundwood production, and therefore do not show characteristics compatible to the early stages of EIA. This is likely to the fact that management shows strict top-down characteristics. An implementation of foresters to take role of mediators within the core of LERM has, from a theoretical and practical perspective, the potential to enable bottom-up management, and therefore allow room for the implementation of EIA in small-scale private forestry.

Key words: sustainable forest management, mediation, policy decentralization, Japan

1. Introduction

For more than a century, forest planning in Japan has been the essential method to implement forest management strategy and policy at local level. The Japan Forest Planning System (JFPS), setting out national forest management plans for private and non-private forests in prefectures throughout the nation, takes over the administrative role of implementing national forestry visions and goals. Forest planning in Japan has been essential for a variety reasons. (1) Japanese forest policy is arranged in forestry related laws, all pointing out the significance of multi-functional forestry, however, enforceability is highly limited at the local level. (2) Regional and local forest plans are dynamic and regularly renewed based on the developing and environmental conditions of forests. (3) Financial support schemes for the implementation of forest management actions in private forests such as thinning and rejuvenation are embedded in the JFPS. However, with the current worldwide trend towards the promotion of Sustainable Forest Management (SFM), the participative role of private forest owners in forest management decisions has become a significant requirement in local small-

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scale management decision making to achieve a shift from forest exploitation to sustainable forest use. However, such a shift is likely only to be realized with adequate local incentive-based policies, and guidance. The recently introduced Forester scheme by the Ministry of Agriculture, Forestry and Fisheries was established to facilitate its vision of creating a secure environment for future generations. Previous research conducted by the author suggests that forester qualifications were predominantly taken by officials working at forest owners' associations (FOA). Despite these new foresters possessing the qualifications for influencing sustainable management decision at the local level, it appears that most of these officials returned to their previous jobs resuming the work they performed prior to taking the forester qualification, without or little adaptation to activities that would influence a shift toward a more sustainable forest use. The purpose of this study is to conduct a follow-up institutional analysis, and mainly discuss the applicability of pairing the current forester scheme with Local Expert Risk Management (LERM), a mediation-based risk management structure developed by the author in 2018, as can be seen in Figure 1, and as described in previous research. In this analysis, the concept of LERM shall provide guidance at the local level for forest management actions that would consider environmental aspects in decision-making related to forest intervention incorporating EIA, and therefore, improve the likelihood for a sustainable management outcome as it is defined in international context.

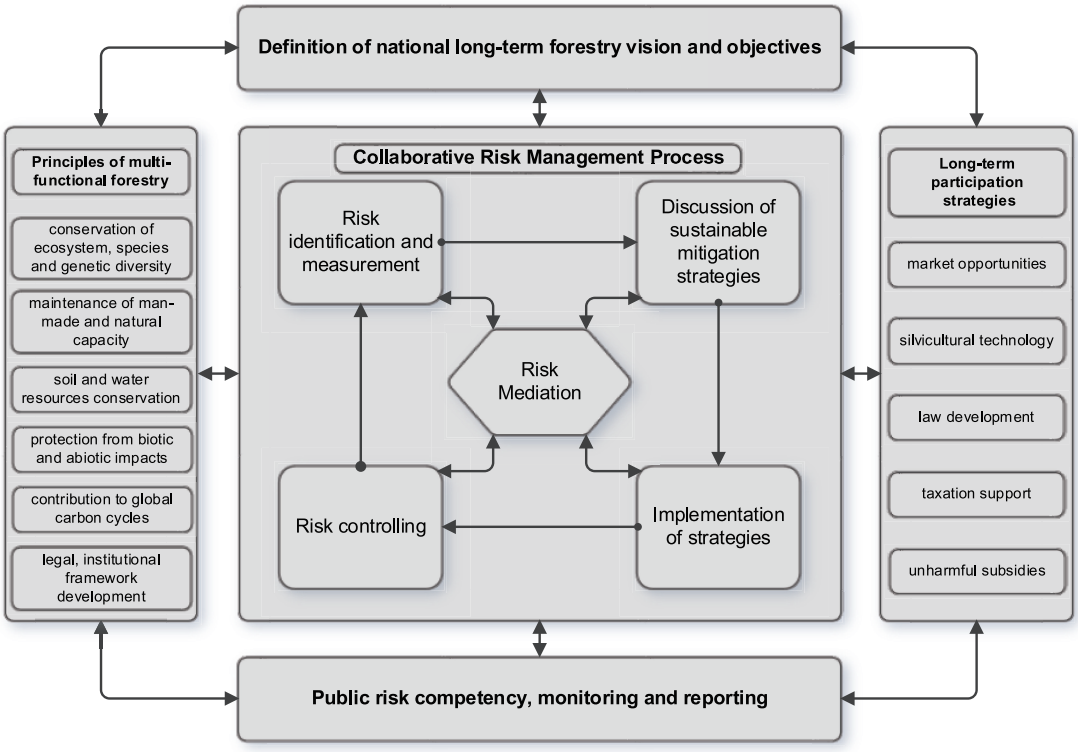

Figure 1: Local Expert Risk Mediation Process

2. Methodology

This study follows a grounded theory approach with open coding. Officials and foresters at two forestry related government and non-government offices in Kochi Prefecture were interviewed on two systematic issues (1) the Strengths, Weaknesses, Opportunities, Risks, and implementability for incorporating EIA to the

current purview of foresters, and (2) the Strengths, Weaknesses, Opportunities, Risks, and implementability for incorporating the new forester purview into LERM as a means to take the role of Risk Mediation for stimulating decision-making processes between a) the private forest owner, b) the forest owners' association, and c) the decision-making body for granting subsidies for forest work at the forest department of the prefectural government. Following coding, data was summarized in a SWOT grid separately to each respective party. Finally, relations between items within the finalized SWOT grid were identified and discussed.

3. Results

It was suggested in the Introduction that the concept of LERM could have the potential to provide environmental and sustainability guidance at the local level to influence forest management decision-making processes by focusing on forest intervention incorporating EIA.

Strengths	**Weaknesses**
- Centralized at local level - LERM communication in exchange for policy - Multi-stakeholder involvement in decision-making processes including private forest owners and environmental conservation groups - Change of forest legislation may not be required	- Short-term decrease of operation efficiency - Larger administrative effort necessary - Forester purview limited to industrial production of roundwood
Opportunities	**Threats**
- May result in a restructuring of local forest subsidy scheme for mixed forests - Forester independence as mediation party - EIA as risk mediation tool for decision-making processes	- Compatibility issues with MAFF forest planning - Risk of loss of regional competitiveness

Figure 2: SWOT analysis based on EIA and forester integration into LERM

It was found that the involvement of foresters in taking the role of risk mediators to perform EIA may hold an opportunity but also a weakness. The opportunity being that foresters would currently fill the empty gap of performing EIA and risk mediation within LERM. The weakness is that the purview of foresters is currently limited to the efficient production of roundwood rather than an efficient production of ecosystem services.
The strengths of EIA and forester integration into LERM were reported to be local-level centralization which could interfere and pose compatibility issues with the forest planning of the Ministry of Agriculture, Forestry, and Fisheries due to its top-down management approach with management decisions being made at the national level. Another strength may be that a change of forest legislation may not be required to produce sustainable outcomes, because centralized mediation, if successful, can lead to consensus among main stakeholders, as these are incorporated in the decision-making process.
As for Opportunities, the prospect of foresters as independent mediators applying EIA during consensus-building processes among stakeholders, was reported to potentially lead to a restructuring of the current subsidy scheme for forest works in private forest, in terms of limiting financial support for works for forest exploitation and including support for alternative works that lead to sustainable forest structures focusing on ecosystem services.

Threats of EIA and forester integration into LERM were reported to be compatibility issues with MAFF forest planning. Moreover, incorporating EIA and foresters into current decision-making structures is likely to increase the cost of roundwood production which would affect regional competitiveness, at least in the short and medium terms.

4. Discussion

4.1 Implementation scenario

Respecting the findings of the SWOT analysis demonstrated in Results, a possible implementation scenario of LERM with EIA and forester integration is shown in Figure 3. The left illustration shows the currently administered management scheme. The illustration on the right shows the LERM Forester EIA Risk Mediation Scheme. The improvements are:

(1) the workplace of the forester moves from the Forest Owners' Association to the respective municipality silviculture department. The forester becomes a public servant with decision-making authority regarding the assessment of the sustainability of forest as defined by international norm and issues EIA statements (EIS) to the Prefecture Forestry Promotion and Environment Division. Based on the outcome of the issued EIS, the Prefecture discusses an appropriate forest management action plan under forester guidance, which is adequate for each individual forest site. Subsidies for forest works are issued whenever appropriate. Suggestions for an adaptation of the subsidy scheme to better serve a long-term sustainable outcome are communicated bottom-up to MAFF. Forests structures being unique and non-comparable depending on site, enabling bottom-up

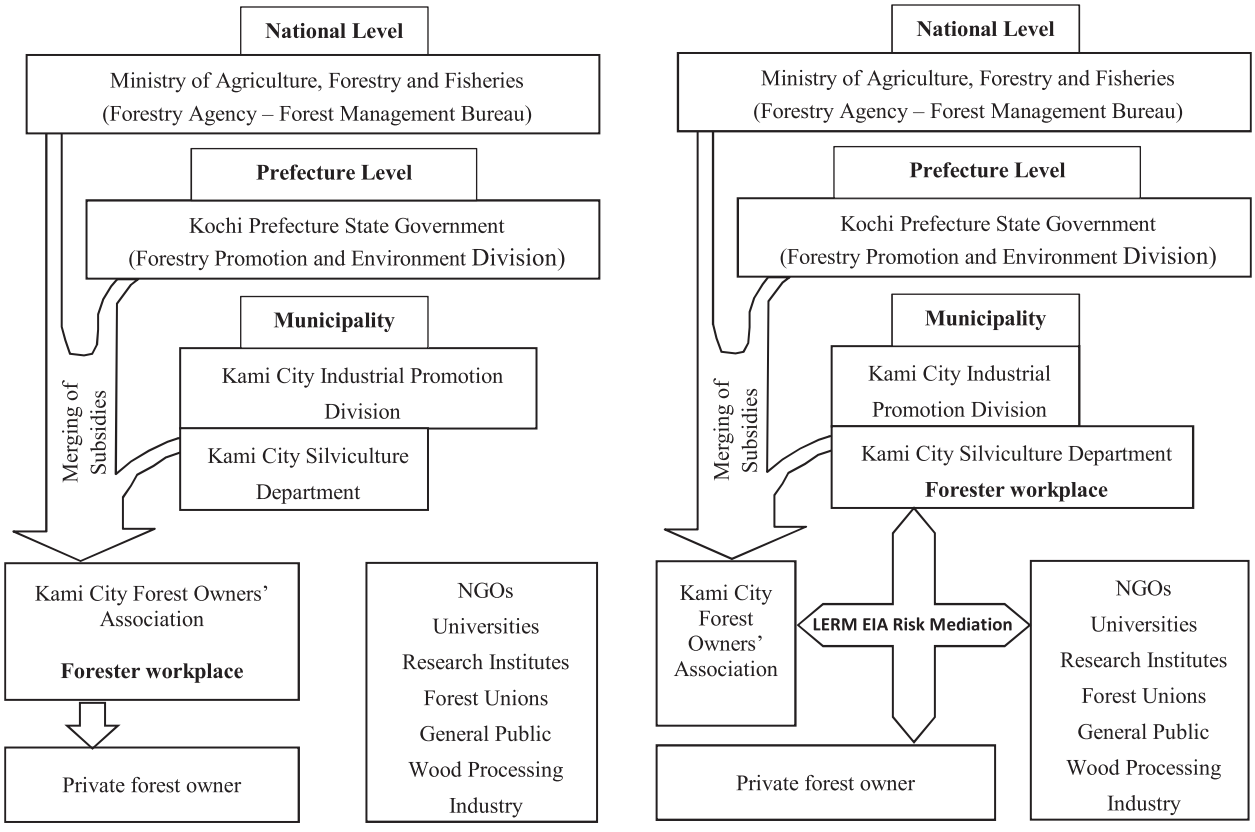

Figure 3: Current management scheme (left), LERM Forester EIA Risk Mediation Scheme (right)

communication between MAFF and the Prefecture allows for MAFF to better understand the resources necessary for producing long-term sustainable outcomes.

(2) EIA is performed by the risk mediator (forester) as defined by international norm during site assessment. Currently, this site assessment is solely performed by the Forest Owners' Association. EIA is performed in four steps and involves the risk mediator, private forest owner, Forest Owners' Association, and other forest stake holding organizations focusing on environmental conservation, industry, and society. EIA is performed by the risk mediator and the municipality forest department and then mediated among stake holding organizations in stages 9 and 10, as demonstrated in Table 1. The Environmental Impact Statement (EIS) will act as the guideline to steer and facilitate decision-making. To implement decisions, subsidies are applied as usual, whenever applicable. The current subsidy scheme is revised according to forest sustainability needs that are revealed during LERM.

Table 1: Stages of EIA

Stage	Definition
1. Project screening	Narrowing of applications of EIA to projects with high environmental impact risk
2. Scoping	Early-stage identification of environmental risks and potential alternatives
3. Consideration of alternatives	Consideration of other feasible approaches including location, scales, processes
4. Description of project	Clarification of purpose and rationale of the project and its characteristics
5. Description of environmental baseline	Establishment of present and future state of environment incorporating changes from natural events and human action
6. Identification of main impacts	Identification of positive and negative environmental impacts
7. Prediction of impacts	Identification of the magnitude of the identified environmental impacts by comparing the present and future situation
8. Evaluation and assessment of significance	Assessment of the significance of the predicted impacts
9. Mitigation	Introduction of measures to avoid, reduce, or compensate for negative impacts
10. Public consultation and participation	Maintains the quality, comprehensiveness, and effectiveness of EIA by incorporating public views in decision-making processes
11. Environmental Impact Statement (EIS) Presentation	Prevention of negation of EIA progress
12. Review	Systematic appraisal of EIS quality as a contribution to decision-making process
13. Decision-making	Consideration of the relevant authority of the EIS
14. Post-decision monitoring	Recording of outcomes associated with development impacts
15. Auditing	Comparing of actual outcomes with predicted outcomes to assess the quality of predictions and mitigation effectiveness

(3) Forest owners keep their positions, however, take an active role in EIA Stages 9 and 10. Such a change in forest owner behavior has several managerial advantages. Currently, the forest owner takes a passive role in decision making processes. The subsidy scheme awards financial support in exchange for the forest owners' authority to make decisions regarding the management of their forest land. This buyout of authority leaves the forest owner in a passive position.

4.2 Adaption of the subsidy scheme

For financial support strategies that involve sustainability risk, economic, environmental, or social, to be effective they are required to be assessed upon predictability (Stage 7) and outweighed equally prior to implementation. Stakeholder demand is varied and requires efficiently balanced policy and adequate stakeholder mediation. Otherwise, the risk may occur that certain interest groups become favorized leaving behind the interests of other stakeholders [12]. This is a common phenomenon in Japanese forestry where forest management decisions are usually made while excluding the stake of environmental conservation groups. However, the implementation of these prerequisites of Sustainable Forest Management (SFM) seems to be problematic. Japan's legal framework does not allow the passing of legally binding prefecture-level forest laws, and national forest policy addresses SFM in a very general and rather undetailed sense [3]. In addition, unlike other industrialized nations, Japan is not in possession of a forester system where foresters are given the authority to enforce forest law, or at least hold a position that would be capable of acting as a source for professional silviculture information, let alone to act as a mediator to negotiate the demands of local stakeholders. It is of general public interest to maintain vital forest, however, an internationally increasing demand for roundwood may increase the uncertainty of forest management like never before [7]. SFM delivers the framework for sustainable development, but it is not a concept to eliminate uncertainty [8,1,15]. Sustainability risks continue to be a significant challenge in decision making processes and any centralized top-down policy is an insufficient measure to address them [16]. Decentralization of forest policy and management seems to be the logical move towards successful implementation because of the unique characteristics of every forest and surrounding habitats. Therefore, local policies and support measures should incorporate stakeholder assessment to see whether decisions are appropriate for the target environment [11]. The homogeneity of tree plantations and their negative effects on the production of natural capital should be reevaluated, and proper mediation between private and non-private stakeholders will play an important role in this process [13,14].

4.3 EIA within LERM

Including EIA in decision-making processes at the local level may have the potential to produce more sustainable decisions. Currently, decisions on how to perform forest interventions, as well as forest design are predominantly made between the forest owner and forest owners' associations. As both parties usually pursue for-profit strategies, environmental factors are seldom considered. Foresters would take the role of mediators and perform EIAs that act as a guideline within the scope of LERM for the prefecture to award subsidies (see Figure 3). As this would require communication about environmental matters, the need for a redesign of the currently used subsidy scheme may occur to improve the compatibility with decisions. Moreover, the inclusion of EIA would require the collecting and analysis of information from a wider range of stakeholders, such as environmental conservation groups, to administer it in the appropriate way. The chance is that environmental conservation groups could become an active and essential part in the EIA and forest intervention related decision-making process, since foresters being no experts in environmental issues,

wouldn't be qualified in providing proper environmental advice, and therefore, not be in the position to perform EIA. Mediation, however, may not produce successful outcomes in certain cases as the need for consideration of environmental matters is momentarily not backed by enforceable policy.

4.4 Risk mediation and competency

The first step in implementing risk mediation in forest management may be a clear definition of risk-politics in which the central principle of management is formed. The central principle addresses the unique local characteristics of forests, as well as the various demands of stakeholders. Risk-strategy refines and structures the central principles into applicable action instructions. Like forester systems, risk mediation combines intern and extern risk communication to act as a driving system that has the aim to effectively administrate among stakeholders to produce fair and sustainable decisions. Vital in this approach is the unbiased treatment of risk management as a dynamic process; identification → assessment → implementation → control → monitoring [6]. Sustainability risks are not one-time phenomena and require constant monitoring and control. However, for risk monitoring to become effective, an adequate level of risk competency is necessary. Risk itself is an abstract construct lying somewhere between complete confidence and complete uncertainty and perception can therefore differ from individual to individual [5]. The possession of an adequate degree of risk competency is vital for managers and the local public to be able to assess risks and their possible outcomes over a wider spectrum, and to enhance local risk decision making processes. A risk management approach that incorporates effective local stakeholder collaboration, a proper degree of risk competency, and with access to market and technology information, investment opportunities, unharmful promotion programs, and transparent forest policy may be a more efficient forest management approach in terms of achieving sustainability.

4.5 Sustainable involvement of private forest owners

Dynamics in Japanese domestic wood markets and policy development would make extended stakeholder participation inevitable [17]. There is an increasing loss of interest of private forest owners in forest management that involves activities other than the creation of fast financial value. Even higher subsidies do not seem to be enough of an incentive for active participation anymore [4,10]. Therefore, the introduction of new financial incentives for public forest management projects, as frequently introduced by the Japanese forest planning system, bring about the elemental risk of merely "purchasing" forest owner participation [9]. These types of currently existing one-time agreements are not designed for a long-term relationship, and interest shown by forest owners is in most cases simply for the present moment. If forest management projects require participation of private forest owners, long-term active involvement should be targeted to avoid such a loss of interest. As other research has observed, the reason for lack of active long-term participation is in the least cases lack of capital, but instead lack of available information on available market chances, access to silvicultural technology, forest law development, and taxation support. Investments that would have been made by private forest owners themselves with proper advice and guidance are lost with one-time subsidy projects [2]. To achieve a condition in which communication with and among multi-stakeholders is effective, a shift from passive to active forest owner participation in management issues is likely to be unavoidable in the long term.

5. Conclusion

As stated in Introduction, the purpose of this study was to discuss the applicability of pairing the current forester scheme with Local Expert Risk Management (LERM), and conduct EIA at the local-level in order to realize alternative management approaches that focus on forest as ecosystems, rather than predominantly areas for the industrial production of marketable roundwood. The SWOT analysis provided insight into the pros and cons of how foresters could apply EIA at the local level while mediating sustainable forest management approaches among stakeholders. While a shift from top-down management to LERM may lead to production inefficiencies for the short and medium terms, it is clear that LERM may have the potential to realize management structures and outcomes that are conform with international sustainability standards in the long term, even without or a minor need for policy adaptations. Nevertheless, implementation of LERM may face the challenge of being rejected by local authorities if the advantages of LERM cannot be communicated effectively. Rather than presenting the concept of LERM at the executive level to organizations individually, it may be necessary to discuss the advantages simultaneously to allow room for interaction.

Future research

Future research is highly encouraged and should include follow-up work on the complicity in how mediation and EIA are to be executed, which incorporates equal rights communication and decision-making processes among stakeholders through collaborative risk management. Especially the consultative role of risk mediation regarding authority structures, decision making processes, as well as the formulation and access to long-term participation strategies should be included.

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References

1. Day, K. J., Pérez, D. M., 2013. Reducing uncertainty and risk through forest management planning in British Columbia. Forest Ecology and Management 300, 117-124. doi:10.1016/j.foreco.2012.11.035
2. Enters, T., Durst, P. B., Brown, C., Carle, J., McKenzie, P., 2004. What does it take? The role of incentives in forest plantation development in Asia and the Pacific. Food and Agriculture Organization of the United States.
3. Gain, D., Watanabe, T., 2013. The contribution of forest regulations on the realization of sustainable forest management: a comparative law study of Japan and Germany. Internet Journal for Society for Social Management Systems , Vol. 3 SMS13-3086.
4. Hasegawa, M., Pulhin, J. M., Inoue, M., 2013. Facing the challenge of social forestry in Japan: the case of

reviving harmonious coexistence between forest and people in Okayama Prefecture. Small-scale Forestry 12, 257-275. doi:10.1007/s11842-012-9210-6

5. Ibers, T., Hey, A., 2005. Risikomanagement. Merkur Verlag.
6. Keitsch, D., 2007. Risk Management. Schaeffer-Poeschel.
7. Spiecker, H., 2003. Silvicultural management in maintaining biodiversity and resistance of forests in Europe − temperate zone. Journal of Environmental Management 67, 55-65. doi:10.1016/S0301-4797(02)00188-3
8. Lindner, M., Fitzgerald, J. B., Zimmermann, N. E., Reyer, C., Delzon, S., van der Maaten, E., Hanewinkel, M., 2014. Climate change and European forests: what do we know, what are the uncertainties, and what are the implications for forest management? Journal of Environmental Management 146, 69-83. doi:10.1016/j.jenvman.2014.07.030
9. Lutz, E., Pagiola, S., Carlos, R., 1994. The costs and benefits of soil conservation : the farmers' viewpoint. The World Bank Research Observer 9 (2), 273-295.
10. Matsushita, K., Taguchi, K., 2011. The Kyoto Protocol and the private forest policy of local governments in Japan. Small-scale forestry 10, 19-35. doi:10.1007/s11842-010-9128-9
11. Paulson Priebe, M. E., Müller, J. G., 2013. Extant forest plantations as a potential bridge between social needs and ecological management: a comparative case study analysis. Journal of Environmental Management 129, 608-614. doi:10.1016/j.jenvman.2013.08.031
12. Rametsteiner, E., & Simula, M. (2003). Forest certification − An instrument to promote sustainable forest management. Journal of Environmental Management, 67, 87-98. doi:10.1016/S0301-4797(02)00191-3
13. Shigematsu, A., Sato, N., 2013. Post forest reversal discussion: restructuring public subsidy system for private forests under the differences of topographic conditions in Norway. Land Use Policy 31, 249-258. doi:10.1016/j.landusepol.2012.07.002
14. Susaeta, A., Carter, D. R., Adams, D. C., 2014. Sustainability of forest management under changing climatic conditions in the southern United States: adaptation strategies, economic rents and carbon sequestration. Journal of Environmental Management 139, 80-87. doi:10.1016/j.jenvman.2014.02.033
15. von Detten, R., 2011. Sustainability as a guideline for strategic planning? The problem of long-term forest management in the face of uncertainty. European Journal of Forest Research 130, 451-465.
16. Wintle, B. A., Lindenmayer, D. B., 2008. Adaptive risk management for certifiably sustainable forestry. Forest Ecology and Management 256, 1311-1319. doi:10.1016/j.foreco.2008.06.042
17. Yamaba, A. & Nakagoshi, N. (2000). Community-based management of rural pine forests in a suburban village of Hiroshima Prefecture, western Japan. Journal of Forest Research, 5, 237-242.

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