Abstracts

Dr. Kazutoki Abe Project Professor, Department of Forest Resources Science, College of Bioresource Sciences, Nihon University

Scientific Evaluation of Disaster Prevention and Mitigation Functions of Forest Root Systems

(1) Comprehensive Perspective on Sediment Disaster Prevention and Mitigation Functions of Forests

There are limits to the ability of forest root systems to prevent landslide. This limitation is evident in the lack of effectiveness in preventing landslide in deeper soil layers where the root system cannot reach. This fact indicates that forests are not a panacea for sediment disaster prevention and mitigation problems and requires a precise understanding of their scope and limitations.

(2) Details of Landslide Prevention Mechanisms by Forest Root Systems

The forest root system is distributed mainly in the shallow topsoil layer. Of these, vertical and horizontal roots are believed to have their own collapse-preventing functions, but there are contradictions in the perceptions of existing studies. We will show these contradictions using specific data. An alternative new way of thinking about this is the "soil deformation deterrent effect" of root systems distributed in shallow topsoil layers. This plays an important role in preventing shallow landslide.

Dr. Takahisa Furuichi Research Specialist, Department of Disaster Prevention, Meteorology and Hydrology, Forestry and Forest Products Research Institute

Possible project frameworks suitable for mitigation of shallow landslides and sediment runoff by development and restoration of forest and vegetation in mountain areas on the background of NbS mainstreaming

It is pointed out that mitigation, or risk reduction, of shallow landslides and sediment runoff by adapting Nature-based Solution (NbS) approaches, specifically here use of forest functions (such as rain interception, stabilization of grounds by tree-root systems, permeable soil development), has not been necessarily facilitated overseas. The situation is not preferable in terms of overseas promotion of the Japanese industry in the forestry sector. In order to enhance planning and implementation of overseas projects for erosion and sediment risk reduction to prevent mountain disasters by development and restoration of forest, we investigated the current international backgrounds of this field of work and the progress of various related projects. In this presentation, results of the investigation are presented, and efficient and effective project frameworks for erosion and sediment risk reduction to prevent mountain disasters by development and restoration of forest are discussed.

Dr. Takashi Okamoto Chief, Erosion Control Laboratory, Department of Disaster Prevention, Meteorology, and Hydrology, Forestry and Forest Products Research Institute

Feasibility of the Japanese Forest-based Disaster Risk Reduction (F-DRR) Techniques in Vietnam

In the mountainous areas of northern Vietnam, as in Japan, sediment-related disasters occur frequently, and urgent countermeasures are needed. To address this issue, the Forestry and Forest Products Research Institute (FFPRI) has been collaborating with Vietnamese Academy of Forest Sciences (VAFS) to explore how the Japanese Forest-based Disaster Risk Reduction (F-DRR) techniques can be adapted to Vietnam's geographical and climatic conditions. Through field surveys and data analysis at a pilot site in northern Vietnam, we identified specific causes of sediment runoff and assess the applicability of Japanese techniques. The potential and challenges of applying the Japanese F-DRR techniques are discussed, considering not only the natural environmental conditions but also the local socioeconomic factors.

Dr. Wataru Murakami Team Leader, Department of Disaster Prevention, Meteorology, and Hydrology, Forestry and Forest Products Research Institute

Development of risk assessment technology for mountain disasters using remote sensing

There is a concern that climate change will lead to larger typhoons and increase the frequency and intensity of torrential rainfall. Accordingly, there is concern about the frequency of landslides, particularly in mountainous regions in the developing countries. In the developing countries, where disaster countermeasures need to be developed with limited resources, it is necessary to assess risk in mountain slopes, considering the potential for disaster occurrence and human activities (land use change such as deforestation). However, risk assessment in mountain slopes is particularly challenging in the developing countries because the spatial information needed for the assessment is often limited. In addition, there are limitations in the collection of information on the ground. Therefore, it is necessary to develop technologies for the collection of reliable spatial information using remote sensing data such as satellite images and other state-of-the-art technologies such as AI, and to assess landslide risks based on such information.

In this presentation, we will introduce the techniques we have developed so far for extracting landslide areas and forest disturbance history from satellite imagery. In addition, we will present the landslide risk map that we are trying to develop for the target area.

Dr. Vu Tan Phuong Director of Vietnam Forest Certification Office, Vietnam Academy of Forest Sciences

Forest-based Natural Disaster Mitigation in Vietnam: The State and Challenges

Vietnam is highly exposed to the vulnerability of natural disasters, especially in the context of climate change. Natural disasters and climate change impacts have been causing significant losses and damage to production, infrastructure and property. The average annual loss and damage value over the period of 2011-2021 was estimated at about 1 billion USD and it is estimated that under the complicated impacts of climate change, the economic loss from natural disasters could reach 14% of Vietnam's GDP. Natural disasters and climate change impacts vary from region to region. In the mountainous areas, the key risks are landslides and flash floods while flooding, drought and coastline erosion are likely to increase in lowland and coastal areas. Vietnam is proactively taking actions to mitigate the natural disasters and climate change impacts. Of the mitigation measures, forests are recognized as important solutions for natural disasters reduction. In this regard, the priorities for forest management will focus on watershed and coastal areas.

Prof. Dr. Yongyut Trisurat Full Professor of Forestry at Kasetsart University in Bangkok, Thailand

Integrated land use scenario to enhance forest ecosystem services in Nan Province, Thailand

The rate of deforestation declined steadily in Thailand since the year 2000, however, this situation does not occur in Nan Province. Deforestation is expected to continue due to high demand for increased agribusiness. In addition, future climate change will accelerate the impacts on ecosystem services. This study aimed to assess the benefit of Forest-based Disaster Risk Reduction (F-DRR) nature-based resolution in mountainous watershed.

This study used spatially explicit models to predict future land use patterns, to estimate biodiversity status, and to quantify watershed services and their economic values. My presentation will share the results by scenarios and the recommendation from the analysis.

Ms. Sunshine Telio Eco-DRR Project Coordinator, Center for Conservation Innovations Philippine Incorporated (CCIPH Inc.)

Enhancing local community resilience through forest restoration and agroforestry

Ms. Telio will be presenting about the implementation of the project "Enhancing community resilience to climate change in mountain watersheds" in the Philippines particularly in the rural Municipality of Tublay in the province of Benguet. This project focuses on the execution of ecosystem-based adaptation and mitigation measures for disaster risk reduction through enhancing the ecosystem services and benefits that we get from the forest. She will also showcase the unique experiences in engaging the grassroots communities and processes that the project has undertaken to ensure appropriateness and applicability of identified ecosystem-based adaptation and mitigation measures for DRR and CCA in the selected locality.

Mr. Rikiya Konishi Forestry Officer, Forest Resilience Team, Forestry Division, FAO

Mainstreaming F-DRR through the FAO project

The Forestry Agency of Japan started the project "Enhancing Community Resilience to Climate Change in Mountain Watersheds" through the Food and Agriculture Organization (FAO) in October 2020, with the aim of mainstreaming F-DRR overseas.

The project has been implemented at the national level in Peru, the Philippines, and Uganda, and at the global level, activities such as the conceptualization of F-DRR, case studies on forest management for disaster prevention, and the mainstreaming of adaptation activities using forests and trees have been carried out.

This presentation will share the insights gained from the FAO project, which are considered important factors in mainstreaming F-DRR at the national and global levels through international organization.