

PROJECT PLAN

I. General Information

Title of Project	<p>Proposal Number: 2023-01</p> <p>Title: Studies on the effects of atmospheric deposition on ecosystems, from a catchment scale to a regional scale</p>
Duration of Project	<p>[January/2023 – December/2025]: 3 years</p>
Project Lead (PL)	<p>[Name of an entity taking the lead in project cycle]</p> <p>Network Center for EANET, Asia Center for Air Pollution Research</p>
Partner organizations (POs)	<p>[List all relevant Partner organizations central to the project]</p> <ul style="list-style-type: none"> • (Japan Society on Promotion of Sciences (JSPS), Japan): a related research grant donor • Niigata University, Japan • Nagoya University, Japan (as a JSPS research project member) • Forestry and Forest Products Research Institute, Japan (ibid.) • Research Institute for Humanity and Nature, Japan (ibid.)
Implementation Agencies (IAs)	<p>[List all relevant Implementation Agencies]</p> <ul style="list-style-type: none"> • Network Center for EANET, Asia Center for Air Pollution Research, Japan • Niigata University, Japan • Nagoya University, Japan (as a JSPS research project member) • Forestry and Forest Products Research Institute, Japan (ibid.) • Research Institute for Humanity and Nature, Japan (ibid.)
Beneficiaries of PCs	<ul style="list-style-type: none"> • General public • Scientists • Policy decision makers
Total Required Resources and Requested amount of Project Fund	<ul style="list-style-type: none"> • The total amount of required resources in USD: 98,000 (for 2023/2024)/ 91,000 (for 2025)/ 287,000 (for three years) • The requested amount for EANET Project Fund (USD): 30,000 (per year)/ 90,000 (for three years) • Note: A research grant has already been secured from JSPS, 17,290,000 JPY (in total) for four years from 2022 to 2025, which would be collaborated with the EANET project. The grant for three years is also included in the total required amount above, although the grant is not transferred to the Project Fund account. The grant is independently managed by the project leader (Dr. Hiroyuki Sase) and his organization (ACAP). Part of the grant (8,255,000 JPY) is allocated to scientists of other Partner Organizations for their roles.

Resources other than EPF from Co-financers	Organization	Financial contribution (USD)	In-kind contribution (with estimated equivalent USD, if possible)	Status (Secured/under consultation etc.)
		30,000 (per year)/ 90,000 (for three years)		Under consultation
	JSPS		38,000 (for JFY2023/2024)/ 31,000 (for JFY2025)/ 107,000 (for three years)	Secured (as the project from 2022 to 2025)
	Total	30,000 (per year)/ 90,000 (for three years)	38,000 (for JFY2023/2024)/ 31,000 (for JFY2025)/ 107,000 (for three years)	
Relevant Types of Activities	<ul style="list-style-type: none"> Monitoring of acid deposition (e.g., catchment-scale monitoring) Development/update of strategy papers (activities in line with the Strategy Paper for Future Direction of EANET on Monitoring of Effects on Agricultural Crops, Forest and Inland Water by Acidifying Species and Related Chemical Substances (2020)) 			
Relevant Scope of EANET	<ul style="list-style-type: none"> To create a common understanding of the state of the acid deposition problems in East Asia. To provide useful inputs for decision making at local, national and regional levels aimed at preventing or reducing adverse impacts on the environment caused by acid deposition. 			
Representative of the Project Lead /Contact Address	<p>Dr. Hiroyuki Sase Network Center for EANET, Head of Ecological Impact Research Department, Asia Center for Air Pollution Research (ACAP) Sowa 1182, Nishi-ku, Niigata City, 950-2144, Japan; sase@acap.asia</p>			
Project Processing Information	Submission Date to the EANET Secretariat			
	1) Date of Register in the Project Cycle			
	2) Date of Latest Project Plan			
	3) Date of Approval			
	4) Date of Completion Report Submitted			

II. Description of the Project

Keywords of the project	<ul style="list-style-type: none"> Response of forest ecosystems Acidification Nitrogen deposition Extreme weather Regional assessment
Summary of the project	<ul style="list-style-type: none"> Responses of forest ecosystems to a changing atmospheric environment have not been enough clarified, yet. This is important not only to create a common understanding on ecological impacts but also to verify the effectiveness of relevant policy measures to date. This project provides the knowledge on responses of forest ecosystems, from a catchment scale to a regional scale. Long-term trends at a forested catchment in Niigata, Japan and other catchment-related EANET data will be assessed taking account of interlinkages with extreme weather. Appropriate methodologies for impact assessments on a regional scale will also be studied in cooperation with other research groups in the EANET PCs and the MICS-Asia community. Scientific outcomes obtained through the activities above will be shared with

	the EANET PCs not only through scientific publications but also through EANET meetings and thematic workshops/seminars.
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<p>Background and Rationale</p>	<p><u>Background and the existing problem:</u></p> <ul style="list-style-type: none"> • Forest ecosystems provide various ecological services, such as provision of nature resources, groundwater recharge, carbon sequestration, and prevention of disasters. Long-term atmospheric deposition of acidifying species and related chemical substances may have disturbed the functions and resilience of forest ecosystems. • According to the experience in Europe and North America, a recovery of forest ecosystems from acidification did not progress as expected and problems remained even after enough reduction of SO₂ and NO_x emissions. Remaining problems, such as O₃ and PM, still exist. • Meteorological variabilities and extreme weather, such as changing precipitation patterns, high temperature and sudden heavy rains, may also affect the recovery process. • Responses of forest ecosystems to a changing atmospheric environment in the region have not been clarified. <p><u>Rationale of the proposal and reasoning for implementation:</u></p> <ul style="list-style-type: none"> • A field observation on a catchment scale is a useful approach to evaluate effects of atmospheric deposition on forest ecosystems, quantitatively and qualitatively, as suggested by previous studies in Europe and the United States. • Regional assessments of ecological impacts by atmospheric deposition have been contributing to reduction of the emissions historically, as shown in the experience in Europe (adoption of relevant protocols under the Convention on Long-Range Transboundary Air Pollution, UNECE). • It is suggested that regional impact assessments be promoted in EANET to create common understanding of the current ecological impacts and provide useful inputs for policy makers. <p><u>Specific solution ways and how to address the problem:</u></p> <ul style="list-style-type: none"> • An external research grant from JSPS has already been obtained to financially support the study on interlinkages between atmospheric deposition and extreme weather for the period 2022 – 2025. Additional surveys/experiments applicable by the grant may upgrade scientific levels of the project. • Regular sampling at Kajikawa catchment (KJK), Japan, will be conducted in cooperation with a local organization, while intensive surveys will be done by ACAP researchers. • Thematic workshops/seminars will be held online to reduce the risk of COVID-19 and to have many audiences. • To promote a capacity building of EANET for regional impact assessments, collaborations with atmospheric modeling communities are useful. Possibility of collaboration with the MICS-Asia community has already been discussed preliminarily with relevant scientists.
<p>Objectives</p>	<ul style="list-style-type: none"> • To understand responses of forest ecosystems to declining atmospheric deposition and any other remaining effects • To promote a capacity building on regional impact assessments for development of methodologies applicable to the region • To provide scientific knowledge for common understanding and future policy measures
<p>Activities to achieve Objectives</p>	<ul style="list-style-type: none"> • Continuation of field observations at a forested catchment, KJK • Additional surveys at KJK and Lake Ijira catchment (IJR) (supported by the JSPS grant) • Data assessment of EANET data, including the catchment-scale data at IJR, and La Mesa Watershed, Philippines, and other inland aquatic environment data, if necessary • Preliminary regional impact assessments utilizing existing methods/data in cooperation with external scientists including the MICS-Asia community • Sharing of the scientific knowledge above through EANET meetings as well as thematic workshops/seminars (not only for scientists but also for governmental officers/ experts: once/twice for three years)
<p>Links and relevance to existing policy process of the target areas and regional activities</p>	<ul style="list-style-type: none"> • The project may provide the scientific knowledges on how forest ecosystems respond to the declining deposition. This is a useful input to verify the effectiveness of policy measures to date. • Promotion of a capacity building on regional impact assessment will be informative for consideration of future policy measures in the region.

Expected Outputs	<ul style="list-style-type: none"> • Long-term datasets at KJK since 2002 • Preliminary map(s) of regional impact assessments • Scientific knowledges on responses of forest ecosystems to declining atmospheric deposition and any other remaining effects, from a catchment scale to regional scale, through the scientific publications and meetings/workshops
Expected Outcome	<p>Based on the scientific outputs above:</p> <ul style="list-style-type: none"> • Identification of the next topics on ecological impacts, such as nitrogen cycle and O3 • Common understanding on the current conditions, such as effectiveness of SO2 and NOX reduction and necessity of reducing emissions of other pollutants, which contribute to discussion for future policy measures in the region • Practical discussion on the future regional assessments in EANET, including how to utilize this approach for further development of the network, such as strengthening the regional framework <p><u>Later ones above are expected to be achieved as middle/long term outcomes.</u></p>
Risks and Countermeasures	<ul style="list-style-type: none"> • In the current plan, field data from two sites in Japan are mainly studied. Additional data analysis for the EANET sites and other research sites will be conducted to obtain wider views, and to compensate possible missing data in the Japanese sites in case. • To reduce health risks of field surveyors under severe summer/winter, schedules of field operations and team members will be considered carefully.
Plan to deliver outcomes to beneficiaries	<ul style="list-style-type: none"> • Publication of scientific papers in international journals • Presentation at EANET meetings/workshops, including a thematic workshop planned in another project activity. • Preparation of leaflets/brochure to introduce project outputs to the general public
Comments from PC to be considered in the implementation	
Responses from the Project Lead to above	
Comments from SEC, NC, PCs	<p>*This column will be filled after submission of the proposal to Sec. Sec & NC provide comments on whether the project meets the project criteria or not. Other than above, the interests of PCs will also be added.</p>

III. IMPLEMENTATION PLAN

In table format, please present a brief, one- to two-page work plan matrix, with a timeline including target dates for activities for the project's life, reflecting the overall program approach and objectives. Applicants may use smaller but legible font sizes in tables.

Activities and Milestones

Name of Activities	Brief Summary of Each Activity with milestones and name of responsible IA	Implementation Period
Field surveys at KJK	Field sampling of rainwater and river water is conducted in cooperation with local surveyors.	Monthly/twice a month through a year
Laboratory analysis of KJK samples	Chemical analysis of the samples collected at KJK is conducted at the ACAP laboratory.	Ibid.
(Intensive surveys during heavy rain events in summer)	(River water chemistry is monitored intensively during heavy rain events to identify mobilization of deposited/accumulated pollutants from forest ecosystems. Soil analysis is also conducted. This work is mainly conducted as a part of the JSPS research project.)	(Mainly in summer)
Data analysis for KJK and IJR with the data from other EANET sites and Japanese national sites	Data analysis is conducted to discuss ecosystem response to changing atmospheric deposition and meteorological conditions. This work is conducted in cooperation with the national monitoring in Japan and the JSPS research project.	Through a year
Discussion on regional impact assessments	Discussion on the preliminary regional impact assessments utilizing existing methods/data in cooperation with external scientists including the MICS-Asia community	Through a year
Publication and conference presentation	Research outputs are published in international journals and/or presented at international/domestic scientific conferences.	Occasionally

IV. BUDGET PLAN

In USD

Name of Activities	Required Resources (financial and in-kind)	Secured Sources for Required Resources	In-balance
Field surveys at KJK	25,000 (per year)/ 75,000 (for three years)	Under consultation	
Laboratory analysis of KJK samples	10,000 (per year)/ 30,000 (for three years)	Under consultation	
(Intensive surveys during heavy rain events in summer)	In-kind from JSPS grant 38,000 (for JFY2023/2024)/ 31,000 (for JFY2025)/ 107,000 (for three years)	In-kind from JSPS grant 38,000 (for JFY2023/2024)/ 31,000 (for JFY2025)/ 107,000 (for three years)	
Data analysis for KJK and IJR with the data from other EANET sites and Japanese national sites	10,000 (per year)/ 30,000 (for three years)	Under consultation	
Discussion on regional impact assessments	10,000 (per year)/ 30,000 (for three years)	Under consultation	
Publication and conference presentation	5,000 (per year)/ 15,000 (for three years)	Under consultation	
Total	98,000 (for 2023/2024)/ 91,000 (for 2025)/ 287,000 (for three years)	Under consultation	

Note: For multiple-year projects, specify the total amount for entire projects and subtotal for each year.