

iCARE Innovation Fund

Satellite and AI-Driven Climate Resilience Tool for Bhutan Six Monthly Progress Report

Reporting period: Jan– June 2024

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1. Project Information

Project Title:	Satellite and AI-Driven Climate Resilience Tool for Bhutan
Project Code:	WBCAR
Partner Organisation:	Department of Local Governance and Disaster Management
Reporting Period:	January - June, 2024
Date of Submission:	12/07/2024
Contact Name:	Roxane Bandini-Maeder
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Status of project progress in this reporting period	<input type="checkbox"/> Significant delay <input checked="" type="checkbox"/> Delay <input type="checkbox"/> On Track
Report sign Off	<input checked="" type="checkbox"/> I have reviewed all the information provided for each section including number of beneficiaries. The information provided for each section of the report is complete. Name: Roxane Bandini-Maeder Designation: CEO

2. Summary of the Achievements

2.1. Overall Progress

The project has made significant progress during the reporting period, despite an 11-day delay, which will not affect the final delivery date of January 15, 2025. Key achievements include the completion of Milestones 1 (contract signature and inception report) and 2 (onboarding stakeholders and stakeholder engagement workshop), and 90% completion of Milestone 3 (geospatial tool and training material).

For Milestone 1, the inception report was a major accomplishment. In Milestone 2, we onboarded a project manager in Bhutan who coordinated with the Department of Local Governance and Emergency Management (DLGDM) and key stakeholders to engage 32 citizens, 17 government officials, and 6 academics. These engagements, through workshops, surveys, focus group meetings, and discussions, fostered a collaborative environment for the co-design of the geospatial tool, emphasizing its necessity for mitigating wildfire threats.

We conducted a training course on Earth Observation, AI, and Data Fusion for 15 participants, enhancing their ability to use these technologies for disaster preparedness and climate change adaptation. Two training materials were produced, and one is 90% complete.

Another key achievement is the development of a geospatial tool to model wildfire severity and critical infrastructure exposure, which is 90% complete. This tool, operating at a 10-meter resolution, uses deep learning to model high and low vegetation at the country level, a capability not widely available globally. We have effectively deployed Geoneon's wildfire severity index and infrastructure exposure index nationwide, crucial for enhancing disaster preparedness across the country.

2.2. Program Indicators

The project has achieved significant milestones since its inception, contributing greatly to program indicators. The onboarding and engagement of stakeholders have enhanced Indicator 1 by providing government agencies and citizens with access to climate-resilient solutions through the project's tools and results. Additionally, the development of a geospatial tool for modeling wildfire severity and critical infrastructure exposure has further strengthened Indicator 1 by offering vital climate-resilient solutions.

The training course on Earth Observation, AI, and Data Fusion has improved participants' ability to utilize these technologies for disaster preparedness and climate change adaptation. This training has contributed to Output Indicator 2 by detailing the number of people trained (online) across various demographics,

and to Output Indicator 3 by building the necessary skills for effectively using the geospatial tool.

Moreover, two training materials have been produced, with one nearing completion, contributing to Output Indicator 4 by adding to the number of knowledge products provided. These materials serve as essential resources for ongoing education and skill development in Earth Observation, AI, and Data Fusion technologies.

The project's stakeholder engagements and training sessions have also supported Output Indicator 5, covering workshops, stakeholder meetings, and training sessions held during the reporting period. These events have been pivotal in fostering collaboration, sharing knowledge, and enhancing the project's overall impact. Additionally, several social campaigns have been undertaken, further contributing to these indicators.

2.3. Gender Mainstreaming

During the consultations and training sessions, the project team made concerted efforts to ensure that women were actively encouraged to participate. In the March workshop session, we achieved a participation rate of 40% women. However, we faced significant challenges in representation due to the low number of women in government and specialised fields such as geospatial technology, a situation particularly pronounced in Bhutan due to current human resource constraints and the limited presence of women in technical disciplines.

To sustain program benefits and ensure continued progress in gender mainstreaming, we have adopted several strategic measures. We have initiated strategic partnerships with academic institutions such as the Royal University of Bhutan to train female students in the adoption and adaptation of the tool for fire management. Additionally, we are engaging NGOs like the Tarayana Foundation and the Bhutan Ecological Society, which have strong community outreach capabilities, to enhance the skills and knowledge related to the tool.

Continuous monitoring with feedback loops is in place to ensure our initiatives remain inclusive and equitable. Our stakeholder engagement processes are designed with gender-sensitive approaches, ensuring that the needs and perspectives of women and marginalised groups are considered, especially during the capacity-building phase.

2.4. Next Steps

Building on our achievements, we will focus on key steps in the next six months to ensure sustainability and further impact. We will continue regular workshops and meetings to maintain our collaborative network and gather continuous feedback. Strengthening connections with government officials, CSOs, NGOs,

and academics will facilitate ongoing collaboration and information sharing. Advanced training workshops will be conducted in August and November, targeting new and existing participants, including government agencies, academics, CSOs, and NGOs.

The geospatial tool will be launched online by mid-July, followed by continuous refinement and enhancement based on user feedback. We will maintain an active social media presence with regular updates to keep the public informed and engaged, and participate in a conference to promote the tool.

Additionally, we will establish partnerships with academic and research institutions to support ongoing research and development, promoting the tool's use in academic research and fostering innovation. By connecting with NGOs and CSOs, we aim to amplify our impact through collaborative projects focused on climate resilience and disaster risk reduction.

3. Summary of Project Beneficiaries

3.1. Direct Project Beneficiaries:

The project directly benefited multiple government and public sector organisations in Bhutan. The Department of Forest and Park Services (DoFPS) and DLGDM particularly benefited in enhancing their mandated capacities and therefore, a strategic outcome process to build risk resilience through a tailored tool that considers Bhutan's specific environmental and unique ecological conditions to model wildfire severity and assess infrastructure exposure. The tool will ultimately contribute to informed decision-support system of both agencies such as the Forest Decision Support System of DoFPS and the Multi-hazard Decision Support System of DLGDM. Additionally, a training session attended by 15 participants, including other relevant government officials and members of NGOs and the private sector, equipped them with the necessary basic skills to understand the usage of Earth Observation, AI, and data fusion technologies.

3.2. Indirect Project Beneficiaries

The indirect beneficiaries of the tool include academic and research institutions like the College of Natural Resources at the Royal University of Bhutan, NGOs such as the Tarayana Foundation and the Bhutan Ecological Society, local government and Bhutan Power Corporation Ltd through the training program and engagement program. The larger communities through the above agencies are poised to gain significant benefits from the project. Although they have not yet fully utilized the tool, these organizations are expected to enhance their capacity for research, community support, disaster risk reduction, and climate change adaptation. The tool will enable these beneficiaries to access improved data and resources on forest fire, fostering informed decision-making and effective planning to protect their communities and cultural heritage sites from climate-related hazards, thereby contributing to a more resilient and prepared society.

4. Performance Outcome Mapping

Table 1 **Error! Reference source not found.** presents the performance outcome Mapping for the reporting period.

Table 1 Implementation progress as of 30th June 2024

Description	Approved budget (in US\$)	Actual expenditure in US\$	Target	Result/achievement
Outcome 1: Enhanced stakeholder engagement and Needs Identification				
<i>Activity 1.1.1: Consultation between DDM and Geoneon to identify Key Stakeholders and engage with them via a letter of Engagement</i>	US\$6,400	US\$6,400		A comprehensive Stakeholder List. On Boarding of Stakeholders in the project by Official Letter issued by DLGDM.
<i>Activity 1.2.1 Development of consultation plan, feedback form, execution of beneficiaries consultation workshops and report outlining findings and data analysis of gender diversity attendance.</i>	US\$31,700	US\$31,700	Execution of Consultation Workshops Feedback Form Consultations Analysis Report	8 Stakeholder Engagement activities, including workshops, meetings, training. 2 stakeholders surveys. Engaged with 32 stakeholders 2 Reports: Consultation Analysis Report and Consultation Workshop Reports

			Stakeholder Consultation Plan.	<p>1 Consultation Plan included in Consultation Analysis Report.</p> <p>1 blog post on the importance of stakeholder engagement in technology project.</p> <p>24 Social media posts through LinkedIn, Facebook and Twitter.</p> <p>1 press release.</p>
Outcome 2: Development and Utilisation of a Customised geospatial Tool				
<i>Activity 2.1.1: Source existing data and analysis of data gaps and pipeline development</i>	US\$88,768	US\$88,768	<p>Geospatial Tool to map hazards and infrastructure exposure</p> <p>Training Material</p>	<p>1 brochure on the functionality of the tool</p> <p>1 training delivery Introduction to Satellite, AI and Data Fusion Technology for Long-Term Preparedness</p> <p>One geospatial tool 90% completed</p> <p>Source DEM and land-use data to successfully integrate them in the pipeline.</p> <p>Successfully model fire severity for the whole country</p>

				Successfully model infrastructure exposure for the whole country.
<i>Activity 2.2.1 Material Creation and Design</i>	US\$13,228	US\$13,228	1 training material	1 training material to Introduction to Satellite, AI and Data Fusion Technology for Long-Term Preparedness 1 training material on the use of the geospatial tool completed at 90%.
<i>Total</i>	140,096	140,096		

5. Partnership

In the past six months, the project team focused on and have successfully achieved several key partnership goals planned. The primary partners, the DLGDM and DoFPS, have been instrumental in advancing the project and achieving the stated outcomes. The partnerships were aimed at gaining a deeper understanding of the technology needs of the primary stakeholders and Bhutan in terms of forest fire management, facilitate data sharing and access, enhance technical discussions and capacity, and ensure comprehensive stakeholder engagement. The partnerships established and strengthened over the past six months have facilitated technical and data contributions and ensured that the project remains aligned with local needs and priorities.

5.1. Understanding the Needs of Key Partners

Early onboarding with DOFPS and DLGDM provided insights into the specific issues and needs related to forest fire management. Drawing from their experiences with past events, trials, and identified capacity gaps, these departments highlighted the unique challenges they face. This information was instrumental in building and customising the geospatial tool to suit the unique characteristics of Bhutan's forest cover. The tool was tailored to account for various assets located within the forests, such as cultural sites, ensuring it meets the specific requirements of Bhutan's landscape and infrastructure.

5.2. Data Sharing and Technical Contributions

DoFPS shared DEM 9 M resolution data, land use and cover data, and fire history points spanning few years which were necessary for accurate vegetation mapping and risk assessment, for the development and calibration of the wildfire severity and exposure models.

5.3. Multi-stakeholder Interest Group Approach

The project focused on building a multi-stakeholder approach to the development and use of the tool. For instance, interest groups were actively consulted and benefited from tailored training sessions designed to enhance their technical capabilities in using the geospatial tool and products. This included human settlement, energy company, NGO, community representative, local governments, DLGDM, DOFPS, GovTech Agency, and forest fire responders (RBP and Desuungs).

5.4. Enhanced Communication and Mutual Accountability

The project team established a routine of regular meetings and updates between the technical team at Geoneon, the project management team, and the key partners (DLGDM and DOFPS). This practice has significantly improved communication, allowing for timely feedback and adjustments to the tool

development. This has fostered a sense of mutual accountability and ensured that project goals align with the needs and priorities, enhancing the project's relevance and impact.

5.5. Partnerships for Future Development

New partnerships with local universities and research institutions (College of Natural Resources, Royal University of Bhutan and the Bhutan Ecological Society) have been initiated to support the continuous development and refinement of the tool. These collaborations will leverage local expertise and foster innovation, ensuring that the tool evolves to meet future challenges. Developing a structured collaboration framework with the training beneficiary entities through drafting of a transition plan or MoUs that detail the roles, responsibilities, or any other relevant framework in the context of Bhutan's non-governmental organisations and academia will be explored with the partners.

5.6. Private Sector Engagement

Engaging with the private sector such as the Bhutan Power Corporation, particularly aims to leverage the private sector's expertise and resources in utilising the technology, tool, and the data generate to enhance its scalability and effectiveness. In Bhutan, electricity assets, including transmission and distribution lines, is both at risk from and a potential source of fire hazards. The tool is designed to provide valuable data and insights that can inform decision-making and policy development at BPC to enable the company to implement measures that mitigate fire risks, protect critical assets and reduce the likelihood of fire hazards originating from their assets.

6. Sustainability

Substantial efforts were made to ensure the long-term sustainability of the Satellite and AI-Driven Climate Resilience Tool for Bhutan. Efforts have been focused on several key areas including knowledge transfer, stakeholder engagement, institutional integration, and capacity building to ensure that the project will continue to deliver benefits well beyond its initial implementation phase. The following highlights the key results achieved and the likely outcomes that contribute to the overall sustainability of the initiative:

6.1. Knowledge Transfer

One of the two training sessions planned for the duration of the project period was conducted and aimed at equipping the stakeholders with the skills necessary to use the geospatial tool effectively and adapt to the needs of the agency. For eg, DOFPS will understand and integrate the tool within its existing decision support system in coordination with the GovTech Agency which is the apex body for the government to develop and/or adopt technology for use within the country. The first training session was attended by 15 participants, including government officials, NGO, private sector and citizens. The training covered advanced topics in Earth Observation, AI, and Data Fusion, enabling participants to leverage these technologies for long-term disaster preparedness and climate adaptation.

6.2. Technical Support

Geoneon has initiated continued discussions between the technology development team and DOFPS/DLGDM, the primary initial users of the tool, over several online meetings, to ensure that they are confident in customising the tool to the Bhutan context. For example, considering climatic zones, vegetation diversity, soil moisture, precipitation and humidity changes within a short span of distance were unique to Bhutan and therefore, needed customisation.

6.3. Institutionalisation of Tools and Practices

Early discussions on mutual efforts were made to institutionalise the use of the geospatial tool within DLGDM and DoFPS for decision support systems. This includes (i) developing comprehensive user manuals, (ii) providing technical support through transfer of user codes at zero cost even beyond the project timeline, and (iii) integrating the tool into the existing decision support systems of both DLGDM and DOFPS either as an application or web-based interface.

6.4. New Partnerships for Sustainability

The project team was active in initiating new partnerships with local universities and research institutions to ensure the continuous development and

refinement of the tool, leveraging local expertise and interests in the use of the tool and its products after the completion of the project. Additionally, partnerships with community-based organisations such as the Tarayana Foundation and Bhutan Ecological Society were secured to enhance community engagement and ensure the sustainability of the project's outcomes through their outreach programs to benefit the communities they serve. The Bhutan Power Corporation Ltd and the Department of Human Settlement participated actively with mutual interests in critical infrastructure risk management from forest fires with the use of the tool or the products generated by the tool.

6.5. Multi-stakeholder Collaboration

The project enabled key stakeholders to understand the criticality of risk management that has a direct and indirect impact on assets and infrastructures that are most vulnerable to forest fires in Bhutan. This included energy, culture, human settlement, ICT assets, and forest and biodiversity.

7. Communication and Knowledge Management

Since the project's inception, Geoneon has disseminated several knowledge materials such as one brochure describing geospatial tool's, reports, social media campaigns, two blog posts, one training material, and one press release. Table 2 summarises communication and knowledge products activities achieved during the last six months.

Table 2: Communication and Knowledge products activity and progress achieved

Related activity number	Communications Activity. Strategy/Tactic	Related communications or Knowledge product	Impact /Change perceived. Big or Small wins. Numbers (If any)
Activity 1.1.1	Press Release for launching the project	Press Release and blog posts	Increased interest from people located in Bhutan.
Activity 1.2.1	Several Social Media Campaign	Several Social Posts on LinkedIn, Facebook and Twitter.	shows total impressions and interactions per social media. Increase interest from people located in Bhutan
Activity 1.2.1	Blog Posts	Blog post on the importance of stakeholder engagement in technology project	Great interest from stakeholders on the blog posts. About 20 views.
Activity 1.2.1	Communicated results for stakeholder engagement	Reports	
Activity 2.1.1	Functionality of the Tool	Brochure disseminated by emails and in person at stakeholders engagement activities	Positive feedback Effective ways to communicate to present the tool.
Activity 2.1.1	Training and Training curriculum	Training to introduce the use of satellite data , AI and data fusion for long-term preparedness. Training Curriculum	Positive feedback Academic institution particularly interested

			to distribute to students. Increased interest from NGO and CSO.
Activity 2.1.1	Media Release	Presentation of the project by Bhutanese media.	Increase awareness of the project.

Our social media engagement has significantly raised awareness about the project and its goals. Through various events and campaigns, we have reached over 13,100 people, resulting in increased public interest and participation ().

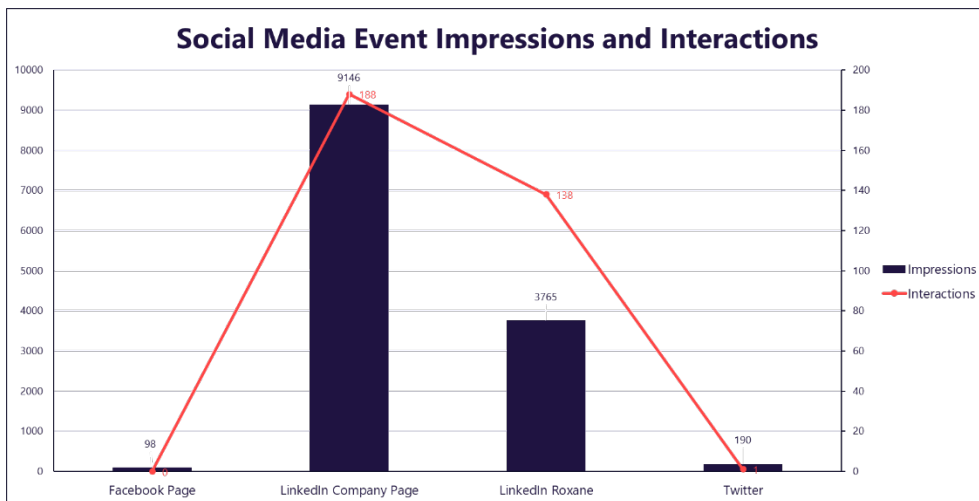


Figure 1: Social Media Event Impressions and Interactions.

These efforts have led to notable increases in engagement metrics across LinkedIn from Bhutan, indicating effective dissemination of information about the project and its objectives.

Gender Mainstreaming and Inclusion Approaches

While there were no specific activities or key knowledge and communication products directly addressing gender mainstreaming or inclusion approaches during this reporting period, the project remains committed to these principles.

Our ongoing commitment is as follow:

- **Stakeholder Engagement:** Efforts are made to include diverse voices from various sectors, including government officials, citizens, and academics, ensuring varied representation.

- **Capacity Building:** Training sessions are inclusive, providing opportunities for both men and women to enhance their technical skills in Earth Observation, AI, and Data Fusion technologies.
- **Public Awareness:** Social media campaigns aimed to reach a broad audience, promoting inclusivity and ensuring that information about climate resilience tools was accessible to all demographic groups.
- **Gender balance:** The project team and implementation partners recognise the challenges in human resource capacities, particularly regarding female participation, and the broader human resource constraints currently faced by Bhutan. To address this, the proposed partnership framework will incorporate mandatory inclusion of women in all training programs.

Moving forward, the project will continue to consider gender mainstreaming and inclusion, seeking ways to better integrate these approaches into future activities and outputs.

8. Challenges and Risks

Throughout the reporting period, the project implementation team faced several challenges and risks that required strategic mitigation measures to ensure the project's continued progress and success.

8.1. Administrative Delays

At the outset, there were initial delays in finalising the contracts and the onboarding of stakeholders. These administrative hurdles delayed the project commencement and key project activities by nearly two months, impacting the overall timeline. To mitigate this and fast track the project activities, internal communication strategies were developed, and the team engaged in early, proactive discussions with stakeholders to streamline administrative processes.

8.2. Geographical Communication Barriers

The geographical distance between the on-site team in Bhutan and the off-site team posed significant challenges in coordination. Time zone differences and logistical issues led to delays in communication and decision-making. To address this, the project team established regular virtual meetings at mutually convenient times and utilised the most common communication and collaboration tools to ensure timely and effective communication. This approach helped synchronise efforts across different locations and maintain project momentum.

8.3. Miscommunication on Deliverables

There was a notable misunderstanding regarding the deliverables for Milestone 2, specifically the stakeholder engagement report. Initially, the team interpreted the requirement as the organisation and execution of the workshop itself, whereas the funding agency expected a detailed engagement report. Upon realising this discrepancy, the team promptly prepared and submitted the additional report. This experience underscored the importance of clear, detailed communication regarding expectations and deliverables, prompting us to establish more rigorous review and clarification processes for future milestones.

8.4. Limited Representation of Women in Technical Fields

One of the persistent challenges has been the low representation of women in technical fields such as geospatial technology in Bhutan. This was particularly evident in our stakeholder engagement sessions, where the majority of participants were male government officials. To counter this, we initiated collaborations with academic institution(s) to encourage more women to

participate in the training programs and project activities at the later stages of the project and in the use of the tool on completion of the project.

8.5. Data Integration and Technical Issues

Integrating diverse datasets from various sources, including high-resolution satellite data, presented technical challenges. Differences in data formats and quality required extensive pre-processing and validation efforts. To mitigate these issues, Geoneon collaborated closely with data providers to standardise data formats and conducted rigorous quality checks and leveraged the expertise of Geoneon's technical team to develop robust data integration protocols that ensured accuracy and consistency in the geospatial tool's outputs.

8.6. Managing Expectations of End Users

There were initial gaps in understanding the capability of the tools especially by the end users who were not technically skilled. to effectively manage the expectations, the project team had focused on transparent communication, collaborative decision-making process and incorporating their feedback throughout the tool's development process. Regular meetings were conducted to ensure they are well-informed about the tool's capabilities and limitations. This approach has been instrumental in setting realistic expectations.

9. Lesson Learnt

9.1. Effective Communication Strategy

The crucial role of effective communication ensuring clear, consistent, and frequent dialogue among stakeholders was vital in managing expectations and aligning activities towards the timeline and outcomes of the project. For instance, delays in contract signing and finalising the inception report highlighted the need for streamlined communication channels to prevent similar issues in future projects.

9.2. Flexibility and Adaptation

The project underscored the importance of flexibility and the ability to adapt to unforeseen changes. The delays encountered in the timeline required the team to remain adaptable and responsive to the challenges and overcome them with alternative approaches.

9.3. On-Site Project Manager for Effective Stakeholder Engagement

The engagement of an on-site project manager proved pivotal in enhancing communication and stakeholder engagement. This role facilitated better visibility and collaboration with stakeholders, ensuring that the project could progress smoothly despite geographical and time zone challenges.

9.4. Early Engagement and Onboarding

Onboarding of non-governmental organisations and communities would have been particularly useful to address the persistent challenge of low representation. This was evident in stakeholder engagement sessions where the majority of participants were male government officials. Collaborations with academic institutions to encourage more women to participate were initiated to counter this issue later.

9.5. Clarification of Deliverables

Miscommunications regarding deliverables were a challenge, notably with the stakeholder engagement report for Milestone 2. This highlighted the need for early clarification of deliverables to ensure that all parties have a clear understanding of expectations, thereby avoiding delays and additional work.

9.6. Continuous Communication and Collaboration

Maintaining continuous communication and collaboration with ADPC and other partners will be crucial. This approach will help address any emerging issues promptly and keep the project on track. Effective communication strategies will be implemented to manage expectations and ensure transparency regarding project developments and timelines.

Annex 1: Training Database / Results Framework / Records of Events

Training Database

Please refer to the document 'iCARE Innovations Fund_Training Database_Geoneon.xlsx' for detailed information on the training database.

Records of Events

Date	Type of Event	Description
2024-01-07	Social Media Post	LinkedIn Roxane Post
2024-01-25	Social Media Post	LinkedIn Company Page Post
2024-01-25	Social Media Post	Twitter Post
2024-01-25	Social Media Post	Facebook Page Post
2024-02-19	Social Media Post	LinkedIn Company Page Post
2024-02-19	Social Media Post	Facebook Page Post
2024-02-19	Social Media Post	Twitter Post
2024-03-11	Sending Material	Beneficiaries Engagement Workshop Material and Finding Reports
2024-04-03	Workshop	Stakeholder Engagement Workshop
2024-04-11	Social Media Post	LinkedIn Company Page Post
2024-04-11	Social Media Post	Twitter Post
2024-04-11	Social Media Post	Facebook Page Post
2024-04-17	Meeting	Technical Meeting
2024-04-25	Social Media Post	Twitter Post
2024-04-25	Social Media Post	Facebook Page Post
2024-05-09	Social Media Post	Twitter Post
2024-05-09	Social Media Post	Facebook Page Post
2024-05-09	Social Media Post	LinkedIn Company Page Post
2024-05-09	Social Media Post	Facebook Page Post
2024-05-09	Social Media Post	LinkedIn Company Page Post

2024-05-09	Social Media Post	Twitter Post
2024-06-11	Workshop/Training	Introduction to Satellite, AI and Data Fusion Technology for Long-Term Preparedness
2024-06-11	Sending Material	Training Material - Introduction to Technology
2024-06-12	Meeting	Introduction to Project - WWF Bhutan
2024-06-12	Meeting	Introduction to Project - United Nations Bhutan
2024-06-12	Meeting	Exploration of potential collaboration - Tarayana-Foundation
2024-06-13	Meeting	Introduction to Project - College Of Natural Resources
2024-06-20	Social Media Post	Facebook Page Post
2024-06-20	Social Media Post	Twitter Post
2024-06-20	Social Media Post	LinkedIn Company Page Post
2024-07-03	Meeting	Technical Meeting - DLGDM & DFoPS
2024-07-04	Social Media Post	LinkedIn Company Page Post
2024-07-04	Social Media Post	Twitter Post
2024-07-04	Social Media Post	Facebook Page Post

Annex 2: Event reports/minutes, Learning documents, Knowledge products, Communication products or other documents

Minutes of the meeting, relevant materials, and social media post log can be found in the supporting document of this report. The attachment includes the following files:

File ID	File Name
1	Supporting_Document_001_Report_Gn-ADPC-320_iCARE-SCALE-UP_Consultation-Analysis-Report_v2-With_Appendices.pdf
2	Supporting_Document_002_Report_Gn-ADPC-433_iCARE-SCALE-UP_Consultation_Workshop_Report_With-Appendix.pdf
3	Supporting_Document_003_Training-Log.xlsx
4	Supporting_Document_004_Geoneon_ADPC_iCARE_Bhutan-1.pdf
5	Supporting_Document_005_Training_Attendance_List_Training_Sensitisation_Technology.pdf
6	Supporting_Document_006_Training-Material_Satellite_AI-Driven-Tech-For-Climate-Resilience.pdf
7	Supporting_Document_007_Stakeholder-Engagement-Log-with-Minutes-Social-Media-Event
8	Supporting_Document_008_iCARE Innovations Fund_Training Database

Links to social media publications and blog posts:

Channel Type	Publish Time	Published URL
Blog	25-Jan-2024	Geoneon and DDM Launch Pioneering Climate Resilience Project in Bhutan
LinkedIn Geoneon	25-Jan-2024	https://www.linkedin.com/feed/update/urn:li:share:7156131325102481408
Twitter	25-Jan-2024	https://twitter.com/geoneon_earth/status/1750365632959250924
Facebook	25-Jan-2024	http://www.facebook.com/104260157631454/posts/888929096363958
LinkedIn Geoneon	19-Feb-2024	https://www.linkedin.com/feed/update/urn:li:share:7165178432014798851
Facebook	19-Feb-2024	http://www.facebook.com/104260157631454/posts/903720678218133
Twitter	19-Feb-2024	https://twitter.com/geoneon_earth/status/1759412737317187631

Blog	9-Apr-2024	Climate Resilience Through Stakeholder Collaboration in Bhutan (geoneon.com)
LinkedIn Geoneon	11-Apr-2024	https://www.linkedin.com/feed/update/urn:li:share:7184003734727802880
Twitter	11-Apr-2024	https://twitter.com/geoneon_earth/status/1778238032916721767
Facebook	11-Apr-2024	http://www.facebook.com/104260157631454/posts/933322665257934
Blog	24-Apr-2024	Case Study: Infrastructure Vulnerability to Climatic Disasters in Bhutan (geoneon.com)
Twitter	25-Apr-2024	https://twitter.com/geoneon_earth/status/1783347199440572914
Facebook	25-Apr-2024	http://www.facebook.com/104260157631454/posts/941529631103904
Twitter	9-May-2024	https://twitter.com/geoneon_earth/status/1788374356818600269
Facebook	9-May-2024	https://www.facebook.com/677216797535190/videos/972436404513143
LinkedIn Geoneon	9-May-2024	https://www.linkedin.com/feed/update/urn:li:ugcPost:7194140543734484992
Facebook	9-May-2024	https://www.facebook.com/677216797535190/videos/989058868782772
LinkedIn Geoneon	9-May-2024	https://www.linkedin.com/feed/update/urn:li:ugcPost:7194157732478791681
Twitter	9-May-2024	https://twitter.com/geoneon_earth/status/1788391558208766097
Blog	19-Jun-2024	The importance of stakeholder engagement in leveraging technology for climate resilience and disaster risk reduction: implementing a wildfire exposure index in Bhutan (geoneon.com)
Facebook	20-Jun-2024	http://www.facebook.com/104260157631454/posts/975510181039182
Twitter	20-Jun-2024	https://twitter.com/geoneon_earth/status/1803594864539386065
LinkedIn Geoneon	20-Jun-2024	https://www.linkedin.com/feed/update/urn:li:share:7209360569974341632
LinkedIn Roxane	1-Jul-2024	https://www.linkedin.com/posts/roxane-bandini-maeder_climateresilience-earthobservation-drr-activity-7209005434387513345-SJLE?utm_source=share&utm_medium=member_desktop
LinkedIn Geoneon	4-Jul-2024	https://www.linkedin.com/feed/update/urn:li:share:7214434999775711233
Twitter	4-Jul-2024	https://twitter.com/geoneon_earth/status/1808669302590951516
Facebook	4-Jul-2024	http://www.facebook.com/104260157631454/posts/984264340163766

Annex 3: Results Framework

PDO 1 Indicator Description: Government agencies and Citizens who have access to climate-resilient solutions tested or access to the results of the climate resilient solutions under the project (Number)		
	Actual (Current)	End Target
Government Agencies	0	5
Male citizen	0	1000
Female citizen	0	1000
Date	30 th of June	
Comments	This will be reflected at the end of project. Engaging with Civil Society Organisations (CSOs) and Non-Governmental Organisations (NGOs) will contribute to better reach and provide citizens with access to results.	
Output Indicators 1: Number of people trained (online) (by sex, country, topic, year, participant category):		
	Actual (Current)	End Target
Participants	15	4
Male including in participants	14	2
Female including in participants	1	2
Date	30 th of June	
Comments	Engagement with students will help increase women participation.	
Output Indicators 2: Number of people trained during the Capacity Enhancement Workshop		
	Actual (Current)	End Target
Participants	0	10
Female including in participants	0	>30%
Date	30 th of June	
Comments	This will be reflected at the end of the project	
Output Indicators 3: Number of knowledge products provided (by type of product, theme, country)		
	Actual (Current)	End Target
Total Products:	2	5
Open-source Geospatial Tool	0	1
Beneficiaries Engagement Workshop and Finding Reports.	1	1
Training Material for the Open-Source Tool	0	1
Geospatial Tool	0	1
Capacity Enhancement workshop	0	1
Training material on the use of satellite imageries, AI and data fusion.	1	1
Date	30 th of June	
Comments	Additional knowledge product was produced: Training material on the use of satellite imageries, AI and data fusion. This training was important to ensure end-user understand the technology behind the tool.	
Output Indicators 4: Number of people provided with knowledge products (by recipient category, type of knowledge product, country, theme)		
	Actual (Current)	End Target
Open-source Geospatial Tool	0	10

Beneficiaries Engagement Workshop and Finding Reports.	32	20
Training Material for the Open-Source tool	0	10
Geospatial Tool	0	10
Capacity Enhancement workshop	0	10
Training material on the use of satellite imageries, AI and data fusion.	23	10
This training is important to make sure end-user understand the tool.		
Date	30 th of June	
Comments	Beneficiaries Engagement Workshop and Finding Reports has been provided to 36 people.	
Output Indicators 5: Number of events supported (by type, year, theme, country)		
	Actual (Current)	End Target
Facebook and LinkedIn Posts	4	6
Press release	2	2
Stakeholder engagement workshop	3	2
Conferences	0	1
Blog Post (Additional)	1	0
Date	30 th of June	
Comments	LinkedIn Post June LinkedIn Post 1 and 2 . Press Release June press release in local news paper Additional Blog Post	
Output Indicators 6: Number of people participating in supported events (by participant category, sex, year, theme, country)		
	Actual (Current)	End Target
Reactions of Facebook and LinkedIn Posts	Total:226 reactions	20
	25 comments	
	19 reposts	
News agency of press release	1	1
Participants of stakeholder engagement workshop	24	10
Participants of conferences	N/A	20
Date	30 th of June	
Comments	We notice an increase of engagement of people in Bhutan on Social Media	
INDICATORS SPECIFICALLY RELATED TO PROJECT		
Outcome 1 Indicator Description: Enhanced stakeholder engagement and Needs Identification		
	Actual (Current)	End Target
Number of stakeholders engaged	37	10
Hazards identification	1	3
Indicators identification	1	2

Critical infrastructure types identification	3	3
Date	30 th of June	
Comments	Please note that a request was made by stakeholder to focus on one hazard but country wide instead of multi hazard in one district. That aligns with the urgency of having a wildfire exposure index. More stakeholder engagements have been undertaken as execution of stakeholder engagement plan.	
Output 1.1 Indicator Description: Number and diversity of stakeholders engaged		
	Actual (Current)	End Target
Number of government officials engaged	15	10
Female including in the government officials engaged	30%	>30%
Date	30 th of June	
Comments	Women in government agencies are less represented than man.	
Outcome 2 Indicator Description: Number of geospatial tool which is functional and ready to be tested		
	Actual (Current)	End Target
Functional tools	0	1
Relevant hazards	1	3
Relevant infrastructures	3	3
Date	30 th of June	
Comments	This will be reflected at the end of phase 2.	
Output 2.1 Indicator Description: Number of people accessing the first open-source tool		
	Actual (Current)	End Target
Number of people accessing	0	4
Date	30 th of June	
Comments	It will be reflected at the beginning of Phase 2.	
Output 2.2 Indicator Description: Number of people with training manual delivered		
	Actual (Current)	End Target
Number of people delivered	0	4
Date	30 th of June	
Comments	It will be reflected at the end of Phase 2.	
Outcome 3 Indicator Description: Capacity Building and tool testing		
	Actual (Current)	End Target
Number of government agencies	10	5
Government officials including in agencies	10	10
Female including in government officials	0	>30%
Number of male citizens accessing the results	0	1000
Number of female citizens accessing the results	0	1000
Date	30 th of June	

Comments	It will be reflected at the end of Phase 3.	
Output 3.1 Indicator Description: Number of people accessing the first open-source tool		
	Actual (Current)	End Target
Number of people trained online prior testing test	0	4
Number of people testing the tool	0	4
Date	30 th of June	
Comments	It will be reflected at the beginning of Phase 3.	
Output 3.2 Indicator Description: A trained cohort of stakeholders capable of using and disseminating knowledge about the tool, promoting gender-balanced capacity building in the local context.		
Number of trained users, disaggregated by gender	0	10
Female including trained users	0	>30%
Number of people delivered with knowledge product	0	10
Femail including in people delivered	0	>30%
Date	30 th of June	
Comments	It will be reflected at the end of Phase 3.	
Output 3.3 Indicator Description: Tool refinement based on feedback		
	Actual (Current)	End Target
Address relevant feedback	0	>70%
Date	30 th of June	
Comments	It will be reflected at the end of Phase 3.	
Output 3.4 Indicator Description: Number of strategic recommendations made		
Strategic recommendations	0	5
Date	30 th of June	
Comments	It will be reflected at the end of Phase 3.	



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