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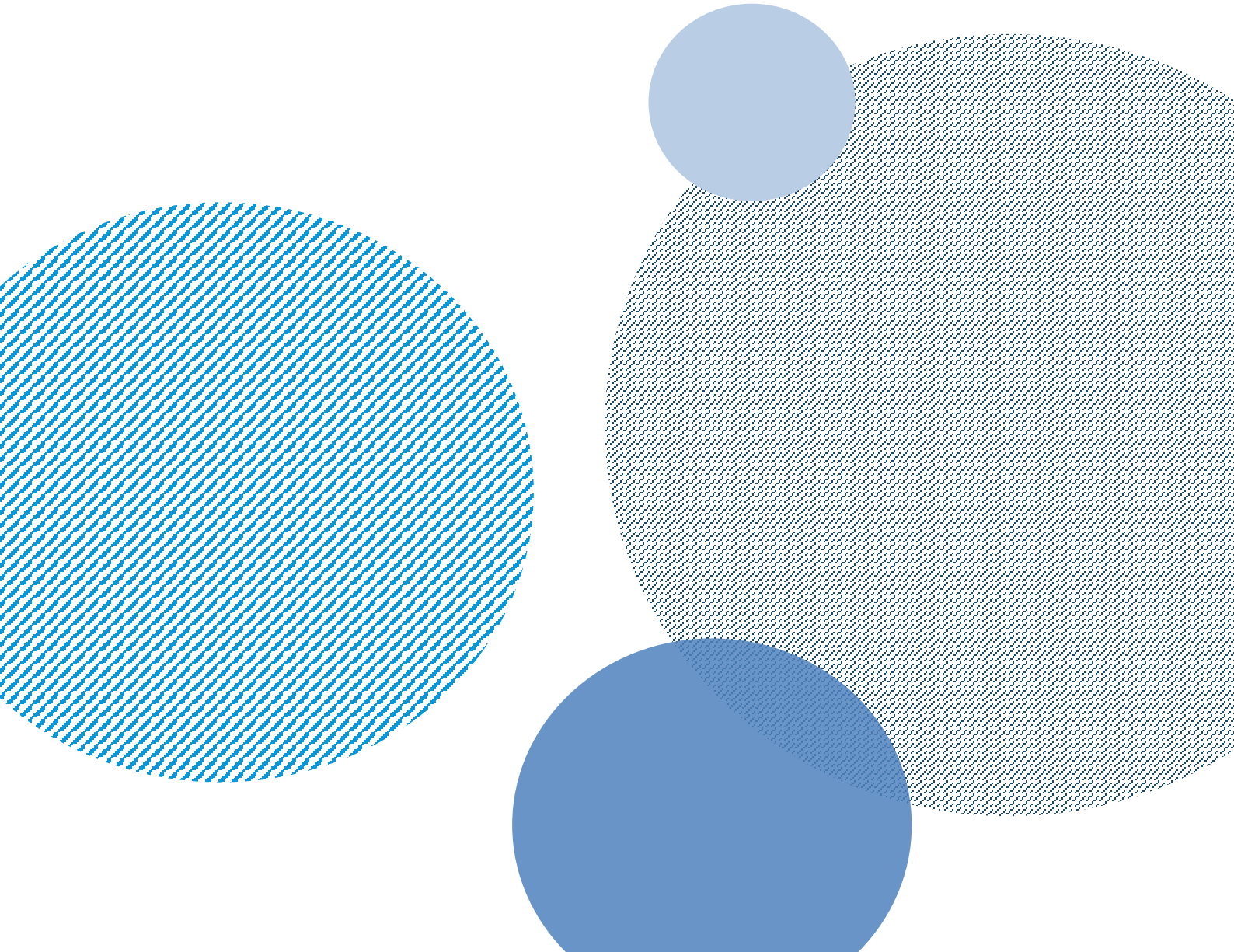
Evaluation of the project on “Improving the use and sharing of geospatial information for resilient and sustainable development in selected pilot countries”

Evaluation report | February 2023



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Prepared by
Tadashi NAKASU, Ph.D.

Commissioned by
ESCAP

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Acknowledgments

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February 2023

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List of acronyms

AI	Artificial Intelligence
AIT	Asian Institute of Technology
APRSAF	Asia-Pacific Regional Space Agency Forum
APSCO	Asia-Pacific Space Cooperation Organization
ARTSA	ASEAN Research and Training Center for Space Technology and Applications
ASEAN	Association of Southeast Asian Nations
BRIN	Badan Riset dan Inovasi Nasional (National Research and Innovation Agency, Indonesia)
CUHK	Chinese University of Hong Kong
DICT	Department of Information and Communications Technology (Philippines)
DOF	Department of Fisheries (Thailand)
DOST	Department of Science and Technology (Philippines)
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agricultural Organization
FIO	Forest Industry Organization of Thailand
GEE	Google Earth Engine
GEM	Gender Equality Marker
GEMS	Geostationary Environment Monitoring Spectrometer
GHG	Greenhouse Gas
GIS	Geographic Information System
GISTDA	Geo-Informatics and Space Technology Development Agency (Thailand)
GNSS	Global Navigation Satellite System
GPS	Global Positioning Systems
HADR	Humanitarian Assistance and Disaster Relief
ICC	Intergovernmental Consultative Committee
IDD	Information and Communications Technology and Disaster Risk Reduction Division
INASA	Indonesian Space Agency Secretariat
IoT	Internet of Things
IPCC	Intergovernmental Panel on Climate Change
MOAC	Ministry of Agricultural and Cooperatives of Thailand
MODIS	Moderate Resolution Imaging Spectroradiometer
MoE	Ministry of Environment (Cambodia)
MSMEs	Micro-, small-, and medium-sized enterprises
MULA	The Multispectral Unit for Land Assessment (Philippines)

NASA	National Aeronautics and Space Administration (USA)
NESDC	Office of The National Economic and Social Development Council of Thailand
NOAA	The National Oceanic and Atmospheric Administration (USA)
ORPA	Research Organization of Aeronautics and Space
PAPGAPI	The Pan-Asia Partnership for Geospatial Air Pollution Information
PDC	Pacific Disaster Center
PhilSA	Philippine Space Agency
PoA	Plan of Action
PRISM	Platform for Real-Time Impact and Situation Monitoring
RADI	Institute of Remote Sensing and Digital Earth of Chinese Academy
RESAP	Regional Space Applications Programme for Sustainable Development
REZoning	The Renewable Energy Zoning Tool
SaaS	Software as a service
SAR	Synthetic Aperture Radar
SCOSA	Sub-Committee on Space Technology and Applications
SDGs	Sustainable Development Goals
SPP	Small Power Producers
STDP	Space Technology Development Programme
UAV	Uncrewed aerial vehicles
UN-GGIM	United Nations Global Geospatial Information Management
UNITAR	United Nations Institute for Training and Research
UNOSAT	United Nations Satellite Centre of UNITAR
UNCT	United Nations County Team
UNOIOS	United Nations Office and Internal Oversight Services
USAID	United States Agency for International Development
VCDRM	Virtual Constellation for Disaster Risk Management
WRF	Weather Research and Forecasting

Executive summary

1. INTRODUCTION

The objective of the project was to enhance the use and application of geospatial information for resilient and sustainable development in Asia and the Pacific. This would be achieved by building the capacity of selected member states to use geospatial data towards resilient and sustainable development, in support of the implementation of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030).

The project was implemented in nine countries. These countries are members of the ESCAP Regional Space Applications Program (RESAP), which expressed interest in participating in the project and demonstrated their geospatial absorptive capacity. The project adopted the following strategies:

a) Leverage the geospatial expertise available through RESAP's service nodes, ESCAP's existing partnership with UNITAR/UNOSAT, and work underway in the UN-GGIM, Asia-Pacific chapter.

b) Collaborate with the private sector to widen and diversify data sources.

c) Collaborate with academia and geospatial specialists to develop guidelines for common data formats and sharing methodologies.

d) Work with selected pilot countries to verify the guidelines and data formats.

The evaluation aimed to support accountability and learning, and inform future program design and implementation. It assessed project performance against standard evaluation criteria, formulated lessons learned and recommendations, and analyzed the results. The evaluation covered the project design, strategy, and implementation. It adhered to the United Nations Evaluation Group(UNEG) norms and standards for evaluation. The evaluation covered the project period from March 2019 to February 2022 and included nine countries Bangladesh, Bhutan, Cambodia, Fiji, Indonesia, Kyrgyzstan, Mongolia, Sri Lanka, and Thailand.

The evaluation followed a mixed method, inclusive, and theory-based approach, with adequate triangulation and counterfactuals to obtain credible, reliable, and unbiased findings. To assess the results achieved, the evaluation used a theory of change approach to understand the results and the process of achieving these results. The theory of change in **Figure 1** is guided by the results framework of the project and the actual implementation strategy and delivery of outputs, as well as feedback from the ESCAP staff.

2. KEY FINDINGS

Effectiveness

The project successfully established integrated platforms and tools that provided significant advantages to governments and stakeholders in pilot countries, specifically within the cities of Bandung and Makassar in Indonesia, as well as Songkhla in Thailand. It also pioneered the utilization of geospatial information pertinent to smart city applications, environmental and disaster monitoring, and COVID-19 mapping. Furthermore, the project stressed ESCAP's role in laying the groundwork for disseminating the knowledge and tools produced through a common data sharing mechanism. Despite the impact of COVID-19 on direct outreach by international project partners, the project successfully overcame this challenge by engaging local experts and institutions, which maximized online benefits and enabled it to meet its targets.

Relevance

The project is aligned with the 22nd ICC's recognition of regional demands, fostering effective partnerships with other United Nations agencies and external partners while supporting countries

through sharing satellite-derived data, tools, products, information, expertise, and capacity-building initiatives. Despite the challenges posed by COVID-19 and the new priorities of the member states, the project design remained unchanged. The project was awarded a one-year extension owing to the innovative and complex nature of the planned activities as well as pandemic-related delays.

Efficiency

ESCAP spearheaded this successful project, which was made possible by the active involvement and support of a diverse group of international and local partners, including the national space agencies, private sector, local universities, and city governments. The coordinated efforts of these stakeholders were instrumental in driving the project forward, and their unwavering commitment to the project's objectives proved invaluable to its success.

Sustainability

The project generated support from the space agencies and pilot city leaders, and thus enhanced the skills of local experts. Additionally, it built a strong foundation for ensuring the Asia-Pacific Plan of Action on Space Applications for Sustainable Development, which can be maintained with or without ESCAP assistance, despite financial constraints and the need for continued effort.

Gender and human rights mainstreaming

This project promoted gender equality by encouraging women's involvement in space-derived data and geospatial information applications. It also supported vulnerable and marginalized groups by improving their access to standardized land-related information. Despite the technical focus of the project and the limited time available for implementation, the evaluation found that the project made the effort to integrate gender and human rights concerns into project implementation.

3. CONCLUSIONS AND LESSONS LEARNED

The project's most notable achievements were the development of a common data format for pilot cities, promotion of resilient and sustainable development policies, and enhancement of regional cooperation for effectiveness. This has aligned with regional demands, the UN mandates, SDGs, and Asia Pacific Plan of Action on Space Application for Sustainable Development (2018-2030).

In terms of efficiency, the project fostered strong partnerships with diverse organizations and experts. The ESCAP leveraged virtual platforms to extend collaboration beyond this region. The ESCAP personnels' expertise and enthusiasm in advancing the SDGs led to the project's insights and experiences being shared across various channels, including an online dashboard, biennial compendium, and the RESAP network.

Furthermore, the evaluation verified the project's integration of gender and human rights mainstreaming, and demonstrated that stakeholders have benefited from technology, knowledge, and field applications in support of sustainable development.

In the post-pandemic evaluation, COVID-19's impact has been evident in travel restrictions, communication adjustments, language barriers with local expertise, and limited in-person expert participation. However, positive outcomes have emerged, such as cloud-based capacity building and geospatial knowledge acquisition.

Despite the project's success in Asia and the Pacific, data integration challenges that include accessibility, availability, actionability, and affordability have persisted. Addressing these challenges has required rapid data collection, effective policy implementation, data privacy, and public collaboration. Regarding lessons learned and good practices, the project represents a crucial first step in overcoming those challenges and setting the foundation for future advancements.

4. RECOMMENDATIONS

Recommendation 1: Further disseminate the knowledge and tools developed by the project.

Recommendation 2: Strengthen communication and cooperation mechanisms by fostering online and offline platforms.

Recommendation 3: Consider the value of all project members by ensuring diverse stakeholder representation, including gender, and specifically the youth and private sector, and promoting sustainability.

Recommendation 4: Promote and conduct onsite training and involve participants with diverse backgrounds and agencies in capacity-building activities.

Recommendation 5: Continue maximize geospatial information potential through user-tailored platform development and multisector engagement.

Recommendation 6: Support the sustainability of initiatives in pilot cities and work towards extend its impact beyond pilot countries.

1. Introduction

The project entitled “Improving the use and sharing of geospatial information for resilient and sustainable development in selected pilot countries” (hereinafter referred to as “the project”) was launched in March 2019, and funded by the Government of China. The project was originally planned to be completed in February 2021. However, after a no-cost extension was granted, the project closed in February 2022.

The key objective of the project was to enhance the use and application of geospatial information for resilient and sustainable development in Asia and the Pacific. More specifically, it aimed to enhance the capacity of member States to use geospatial datain support of the implementation of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030).

The project’s aim was to develop guidelines that can serve as a point of entry for the storage, access, and retrieval of geospatial data and information in a common format. This contributed to the definition and description of a future information repository that would facilitate data sharing among end users, providing them with crucial and commonly formatted information for better decision-making.

The project was implemented in five pilot countries (Indonesia, Kazakhstan, Mongolia, Sri Lanka, and Thailand), including three pilot cities (Makassar and Bandung in Indonesia and Songkhla in Thailand) selected from members of the ESCAP Regional Space Application Program (RESAP) that expressed interest and demonstrated geospatial absorptive capacity.

The evaluation assessed, inter alia, the effectiveness and relevance of the project and has supported future project design through lessons from its implementation. The evaluation covered all project activities from inception to conclusion and was conducted between November 2022 and February 2023.

Per the UNESCAP Monitoring and Evaluation Policy and Guidelines of 2017, this terminal evaluation aimed to generate information on the results achieved and lessons learned from the project for the planning and implementation of future ESCAP capacity development work.

The key intended users of this evaluation result are UNESCAP, particularly IDD. Other expected users include project participation and implementation partners.

2. Description of the Project

2.1 Background

Geospatial data are highly relevant for certain sectors, such as infrastructure, agriculture, and urban development. Such data allow social, economic, and environmental information to be linked to time and location attributes in a cost-effective manner. This enriches our understanding of ground-level impacts and interlinkages, both over time and in real-time, and provides insights that would otherwise not be available. For example, two prominent areas of concern are: disasters and sustainable management of natural resources.

Disasters, for instance, have particularly devastating impacts on infrastructure, crops, and urban assets, as well as on the people who depend on such assets. The deployment of geospatial data at all phases of disaster management, mitigation, preparedness, response, and recovery, can help reduce losses and save lives. Data captured by Earth observation satellites are reliable tools for evaluating geo-environmental catastrophes because they provide synoptic coverage of a very broad area in a cost-effective manner. Such data overcomes the limitations inherent to conventional ground information during extreme events. Moreover, such data provide researchers with multi-date satellite imagery that is critical for monitoring and recording changes over time.

Similar time series considerations hold for the sustainable natural resources management. The integration of stakeholders from different decision-making levels in planning, negotiation, and implementation is a crucial characteristic of the management, which requires a deep understanding of the processes at different scales. Geospatial information management tools support this approach.

However, the quality, accessibility, and availability of geospatial data remain key unaddressed challenges, even as their use is progressively augmented by digital innovations and new technologies. The rising economic losses resulting from the destruction of physical assets in recent major disasters highlight the gap between available geospatial information and informed cross-sectoral decision-making. Urban areas, where the highest share of a country's physical assets is located, continue to be the most hazard-exposed areas of the region, as are the ICT, transport, and energy infrastructure sectors, where up to 70 per cent of disaster-related economic losses can be attributed to infrastructure damage or destruction and the attendant socio-economic spillovers.

This situation highlights the need to find solutions to improve the availability and accessibility of quality geospatial information and services across concerned sectors. Furthermore, it highlights the need to improve the communication and sharing of data among countries in common formats.

Based on the recognition of above mentioned situation, the project was implemented in pilot countries identified among the members of the RESAP.

2.2 Link to the Sustainable Development Goals (SDGs)

The main objective of this project was to develop guidelines for a common data format for cross-sectoral and cross-country geospatial data sharing and applications. The focus sectors included disaster management, energy, ICT, transport infrastructure, and urban planning. The resulting guidelines improved both inter-country comparability and in-country use of georeferenced socioeconomic data and services to measure progress and identify potential risk spots in resilience building across several SDGs. These included SDG 1 (Poverty eradication–Target:1.5), SDG 7 (Affordable and clean energy–Target:7. b), SDG 9 (Industry, Innovation, and Infrastructure–Target:9.2), SDG 11 (Sustainable cities and communities–Targets:11.5 and 11. b), and SDG 17 (Partnerships for the Goals–Targets:17.6, 17.9, 17.16, and 17.18).

2.3 Project theory of change

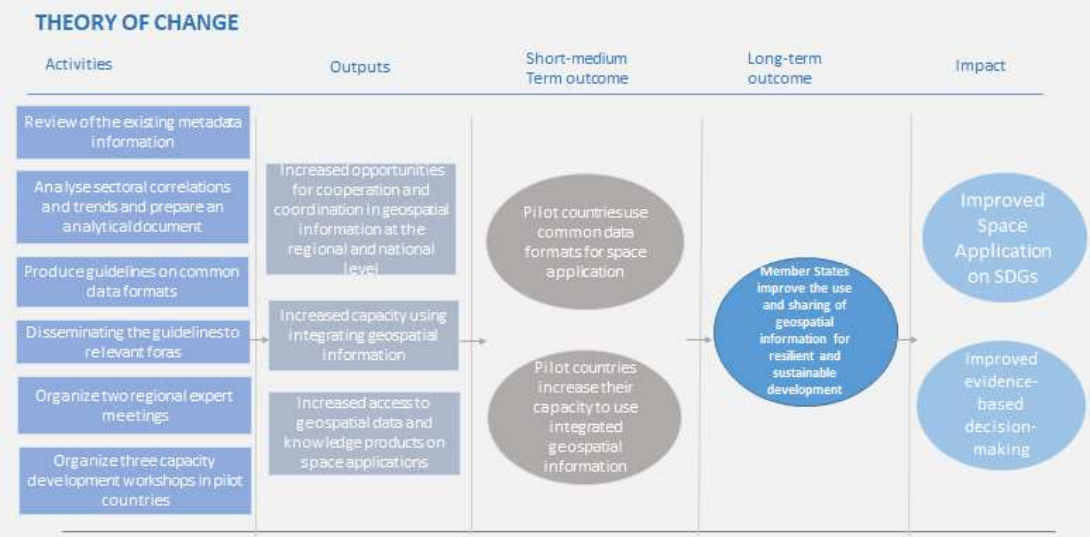
The evaluator constructed a theory of change based on the project results framework and the actual implementation, as shown in **Figure 1**.

The expected outputs of the project activities included increased opportunities for cooperation and coordination in geospatial information at the regional and national levels, an increased capacity to integrate geospatial information, and increased access to geospatial data and knowledge products related to space applications.

In the short to medium term, the anticipated outcome was that pilot countries will utilize common data formats for space applications and increase their capacity to use integrated geospatial information. In the long term, the expected outcome was that member states improve their use and sharing of geospatial information to achieve resilient and sustainable development.

The ultimate impact of these efforts was improved space applications to achieve SDGs and evidence-based decision-making. Overall, this Theory of Change provided a framework for understanding how a project's activities and outputs can lead to the desired outcomes and long-term impacts.

Figure 1. Theory of Change



2.4 Project strategies

This project aimed to build guidelines that would serve as a point of entry for the storage, access, and retrieval of geospatial data and information in a common format. This contributed to the definition and description of a future information repository that facilitates data sharing among end users, providing them with crucial and commonly formatted information for better decision-making.

To ensure effective delivery, the project adopted the following strategies:

a) Leverage geospatial expertise available through RESAP service nodes, ESCAP's existing partnership with UNITAR/UNOSAT, as well as the work underway in

the UN-GGIM, Asia-Pacific chapter.

b) Collaborate with the private sector to widen and diversify sources of data supply.

c) Collaborate with academia and geospatial specialists who develop guidelines for

common data formats and data sharing methodologies.

d) Work with selected pilot countries to verify the guidelines and data formats.

The project created ample opportunities for a collaborative platform to strengthen the Asia-Pacific Disaster Resilience Network, where data on geospatial initiatives could influence decision making and policy.

In this regard, the project sought to increase the quality, comparability, and accessibility of geospatial data for a deeper understanding of the progress and challenges of building resilience in the identified sectors. Such improved and more readily accessible geospatial data can also inform and shape policy decisions that can respond to gender and human rights mainstreaming in areas such as disaster risk reduction, environmental management, and climate change adaptation for sustainable development.

Two expert group meetings were convened as part of this project. The first identified areas of joint work and explored challenges and the specific capacity development support needed by pilot countries. The experts identified issues related to the data format, methodologies, data storage, structure of the database, and dynamic query of data quality information. A second expert group meeting was organized to discuss steps in implementing a common data format and to agree on subsequent steps in terms of portal and system design, as well as appropriate tools for creating a metadata framework.

In addition, three capacity development workshops were organized in the pilot countries with the participation of local and international experts. The workshops explored the initial data-sharing applications under several scenarios with sectoral data to verify the guidelines and data format.

In the project process, it promoted women's participation in using space-derived data and geospatial information applications by inviting more female experts to participate in the situational analyses, design, implementation, monitoring, and evaluation of outputs and outcomes.

As a significant part of the project strategies, the ESCAP aggregated country-level activities to influence regional policy and development towards region-wide common data approaches through its two committees: the Committees on Information and Communications Technology, Science, Technology, and Innovation; and Disaster Risk Reduction.

2.5 Innovative elements

As the pandemic did not exist before the project began, it was necessary for the project to remain flexible and adapt to social needs and challenges as the circumstances evolved. This approach allowed the project to maximize its contribution to the pandemic response. For instance, the Geo-Informatics and Space Technology Development Agency (GISTDA) in Thailand utilized space applications to analyze reduced nightlight images and monitor the impact of the COVID-19 lockdown measures. Similarly, the National Institute of Aeronautics and Space of Indonesia (LAPAN) developed a data hub to perform risk assessment and visualization of COVID-19. LAPAN incorporates mid-, high-, and very-high-resolution satellite data with statistics to determine the potential risk of COVID-19 spread. These examples became possible under project activities during the exercise of smart cities with drought and flood mapping for pilot countries. They demonstrated how spatial and geospatial information applications played a crucial role in providing policymakers and the public with essential location-based and temporal data, allowing for an overall data map and a status snapshot of the COVID-19 pandemic. Regional cooperation has aided governments in operating a comprehensive platform to better integrate various types of data and information, including satellite-derived and ground geo-referenced data, in response to the COVID-19 pandemic, although the structure of the platform used by governments varies from country to country.

2.6 Beneficiaries, target countries and key partners

The target countries and their partner entities for project implementation included Thailand's GISTDA; Cambodia's Ministry of Water Resources and Meteorology (MOWRAM); Indonesia's LAPAN now the National Research and Innovation Agency; Kyrgyzstan's Ministry of Emergency Situations and Ministry

of External Trade and Industry; Mongolia's National Remote Sensing Center (NRSC); Fiji's Ministry of Infrastructure and Transport; Bangladesh's Disaster Management Department, Ministry of Posts, Telecommunications and Information Technology, and Ministry of Planning; and Bhutan's Ministry of Information and Communications.

Collaborating UN entities for the project included the Transport Division (TD), Energy Division (ED), Statistic Division (SD), and Environment Development Division (EDD Urban Planning) of ESCAP. The divisions contributed by evaluating the data based on their experiences. They reviewed the collected data to gain insight into how best to handle the project data. They then developed guidelines on harmonized formats for data compilation, which referred to providing consistent and standardized methods for organizing and presenting data. This helped ensure that the data were available, accessible, affordable, and actionable for the project's participants and stakeholders.

Additionally, other agencies involved in the project included UNITAR's Operational Satellite Applications Programme (UNOSAT), United Nations Global Geospatial Information Management (UN-GGIM), Regional Space Applications Programme for Sustainable Development (RESAP) space Agencies, Asian Institute of Technology (AIT), Asia-Pacific Space Cooperation Organization (APSCO), National Remote Sensing Center of China, Institute of Remote Sensing and Digital Earth (RADI) of Chinese Academy, Beihang University, Chinese University of Hong Kong (CUHK), and Geoscience Australia for the project design and implementations.

2.7 Resources

The estimated project budget was US 209,050 from the contributing donor, the Government of China, with an original implementation period of a minimum of 24 months from the date of approval, December 28, 2018. Due to COVID, the project received a twelve-month no-cost extension until the end of February 2022.

The budget was divided into four main categories: staff and personnel costs, contractual services, operating costs, and travel costs. Staff costs included expenses for two consultants, totalling $39,000. Contractual services included expenses for a GIS technical assistant and an editor, totalling $18,500. Operating costs included provisions for two expert meetings, totalling $14,000. The travel category was divided into four subcategories, covering regional meetings, technical visits/regional meetings, national workshops for international participants, and national workshops for national participants, totalling $113,500. Finally, there was a provision for program support costs (PSC) for the UN of 13%, totalling $24,050.

3. Evaluation objectives, scope, and methodology

3.1 Purpose and objectives

The purpose of the evaluation is to support accountability for the results and enable learning. The primary users of the evaluation results are ESCAP, particularly IDD. Other expected users include project participation and implementation partners.

The objectives of the evaluation are to:

1) Assess project performance against the evaluation criteria of effectiveness, relevance, efficiency, sustainability, gender and human rights mainstreaming, and any other cross-cutting issues as deemed relevant.

2) Formulate lessons learned and action-oriented recommendations to inform management decision-making and improve future project design and implementation.

The evaluation analyzed the level of achievement of project results, making use of the project's results framework, implementation processes, and contextual factors. As much as possible it established causal linkages guided by the evaluation criteria and questions. The evaluation was conducted in line with the ESCAP Monitoring and Evaluation Policy and Guidelines[1] and the United Nations Evaluation Group (UNEG) norms and standards for evaluation.

3.2 Evaluation scope

The evaluation covered the entire period of project implementation, from March 2019 to February 2022, in all participating countries, including Bangladesh, Bhutan, Cambodia, Fiji, Indonesia, Kyrgyzstan, Mongolia, Sri Lanka, and Thailand. The assessment covered all modes of implementation of the project, including national and regional workshops, training, and additional activities, as agreed upon based on consultations with the project countries.

In line with Terms of Reference (ToRs) and the evaluation matrix in Annexes 1 and 2, the evaluation responded to questions shown in the table below which provides a summary overview of the programmatic scope of evaluation.

Table 1: Evaluation Criteria

Evaluation Criteria	Evaluation questions
Effectiveness	What were the most significant results at the regional and national levels achieved or contributed by the project? Describe the project activities/outputs that lead to the results and present evidence of project's contribution to the results. How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?
Relevance	To what extent was the project designed based on demand from the target beneficiaries?

[1] ESCAP, ESCAP Monitoring and Evaluation Policy and Guidelines, 2017, available on the ESCAP webpage at http://www.unescap.org/partners/monitoring-and-evaluation/evaluation.

	What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States?
Efficiency	To what extent did the project achieve efficiency in implementation through the combination of project stakeholders involved, making use of comparative advantages and the creation of synergy? To what extent has partnering with other organizations enabled or enhanced reaching of results?
Sustainability	To what extent can results of the project be continued without ESCAP's further involvement?
Gender and Human Rights Mainstreaming	To what extent were gender and human rights integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis?

3.3 Methodology

3.3.1 Evaluation Approach

The evaluation followed a combination of mixed method, inclusive, and theory-based approaches with adequate triangulation and counterfactuals to obtain credible, reliable, and unbiased findings. To assess the results, the evaluation used a theory of change approach to understand the results and the process of achieving them. The theory of change in **Figure 1** was guided by the results framework of the project and the actual implementation strategy and delivery of outputs, as well as feedback from the evaluation and project officers.

In accordance with the ToRs, the evaluator collected primary evaluation data using surveys, in-depth interviews, and focus group discussions (FGDs) by engaging project stakeholders, including ESCAP staff members, national and local policymakers, counterparts, partner agencies, academics, industry, and non-governmental organization representatives, either individually or in small groups.

To assess the effectiveness, relevance, efficiency, sustainability, and gender and human rights mainstreaming of the project, the evaluator conducted interviews with key stakeholders using purposeful sampling, and in-depth interviews with the implementing partners and other related stakeholders. The selection criteria for interviewees included their involvement in the formulation and/or implementation of the project and the criteria set forth at the inception stage of the project.

To maintain the gender balance, the interviewees included both male and female stakeholders. The interviews were conducted using question guides/questionnaires (provided in Annex 3) that were developed by the evaluator, before being sent to the Evaluation Reference Group for feedback and approval. To ensure a smooth conduct of the qualitative interviews and to increase the collection rates and data analysis for the quantitative surveys, ESCAP supported the initial establishment of contact by introducing the evaluator and providing a survey platform. The interviews were conducted remotely using online applications, such as Zoom and Microsoft Team, as this was most preferred by the informants. The survey was used online platform for effective data collection and analysis.

3.3.2 Sampling

Evaluation sampling was based on nonparametric qualitative and quantitative surveys. For the qualitative part, purposeful sampling was applied; outlier/extreme group success cases, typical case sampling, key informant/key knowledgeable sampling, maximum heterogeneity sampling, homogeneity sampling, focus group selection, and existing group selection were applied depending on the target interviewees, prioritizing the questions to be asked. For the quantitative survey, an online survey platform was used to obtain an adequate maximum number of stakeholders' responses.

3.3.3 Gender and Human Rights Mainstreaming

A crucial aspect of the "Leave no one behind" initiative is to focus on gender equality and support vulnerable and marginalized communities. In this evaluation, the 2030 Agenda for Sustainable Development and the Office of Internal Oversight Services (OIOS) evaluation quality assessment methods were used to investigate human rights and gender equality principles. The evaluator also consulted the United Nations Country Team (UNCT) Gender Equality Marker (GEM) Guidance Notes. The evaluation examined whether these factors were considered when selecting key stakeholders for project design and implementation as well as when choosing evaluation respondents for interviews.

3.3.4 Risks and Limitations

Below were the limitations, challenges, and risks faced by the evaluation and mitigation measures.

Limitation: Remote data collection, stakeholder availability, and the lack of field visits posed significant challenges to the evaluation process.

Mitigation measures: To overcome these challenges, the ESCAP assisted in reaching out to stakeholders and communicating the importance and expectations of the evaluation. The evaluator also maximized the benefits of online interviews and group discussions using the AI transcript to ensure effective data collection and analysis. Additionally, alternative methods such as online platforms for questionnaire surveys provided by the ESCAP evaluation unit and email conversations were used to reach stakeholders who were unable to participate in scheduled online discussions. These measures allowed for much more diverse views to be collected, despite the limitations posed by remote data collection, stakeholder availability, and a lack of field visits.

4. Evaluation findings

This section has offered comprehensive findings drawn from the independent evaluation of the project.

The findings were categorized according to the effectiveness, relevance, efficiency, sustainability, and gender and human rights mainstreaming criteria of the United Nations Evaluation Group (UNEG) and the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC). The evaluation research questions have guided the presentation of the findings, which were evaluated at the outcome level, reflecting the changes in behaviours or practices of the targeted groups/countries influenced by the project, including those carried out collectively with its development partners. The outcomes also have reflected the benefits and actions taken by target groups/countries through project interventions. Although this report covered all the questions stipulated in terms of reference, emphasis was placed on issues or topics deemed significant from the triangulated data. A list of interviewees has been provided in Annex 4. The main questionnaire's results have been shown in Annex 5.

4.1 Effectiveness

EQ1 : What were the most significant results at the regional and national levels achieved or contributed by the project? Describe the project activities/outputs that lead to the results and present evidence of the project's contribution to the results.

Finding 1: The project successfully developed integrated platforms and tools that immediately benefited governments and stakeholders in pilot countries, particularly in the cities of Bandung and Makassar in Indonesia and Songkhla in Thailand; piloted the use of geospatial information related to smart city applications, environment and disaster monitoring, and COVID-19 mapping; and emphasized that ESCAP built the foundation to disseminate the knowledge and tools generated by the project through a common data sharing mechanism.

The project achieved significant outcomes, notably with integrated platforms and tools developed by Indonesia, Kazakhstan, Mongolia, Sri Lanka, and Thailand, which harnessed geospatial information to support smart city applications, flood monitoring, drought monitoring, and COVID-19 pandemic mapping and monitoring. Especially, the adoption of integrated geospatial information platforms and tools has been most advanced in Makassar, Indonesia, where smart city applications have been successfully implemented. This serves as a best-case example for other cities in the region as shown in **Box A**. Cities such as Bandung in Indonesia and Songkhla in Thailand have also demonstrated remarkable success in applying geospatial information platforms to cater to their specific needs.

Another noteworthy accomplishment of the project was the enhancement of capabilities in the pilot countries. This enabled the exchange of information and expertise related to current geospatial metadata standards, shared data protocols, and metadata frameworks in geospatial applications. As a result, this initiative has substantially furthered the adoption of geospatial information applications for resilient and sustainable development in disaster management, energy, information and communication technology (ICT), transportation infrastructure, and urban planning. All of these advancements fall within the comprehensive structure of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030).

Regarding the project activities/outputs that led to the results, upon the project's completion, a comprehensive set of process guidelines and a common data format framework were established to promote consistency and facilitate access to geospatial data repositories.

During the project, these repositories were utilized in target countries to develop a variety of tools and applications for smart city solutions, flood monitoring, drought monitoring, and COVID-19

pandemic mapping and monitoring. Furthermore, the guidelines have offered a wealth of resources and processes for SDG assessment and monitoring, including integrating statistical data and measuring indicators that could aid and inform future policy development and decision-making. Based on the questionnaire, respondents mentioned that the project was a good practice that introduced methods integrating geographical and statistical data into policymaking and actions towards meeting the SDGs at regional and national levels. The project provided opportunities to involve more stakeholders and improve the capacity of technical knowledge regarding methods and tools for identifying gaps, the ways of using different data, and prioritizing actions, which were important in the evaluation process towards local sustainable development in pilot cities and beyond. By providing guidance and training sessions, the project supported the pilot cities, researchers, and others in moving forward.

The results of the questionnaire survey showed that the project activities were effective in achieving the intended results, with 57.1% strongly agreeing and 35.7% agreeing. Gender and organizational differences indicated that female respondents and private sector stakeholders were optimistic about the project.

The desk review, questionnaire, and interview surveys indicated that ESCAP interventions have fully achieved the expected outputs. Furthermore, they confirmed that project outputs effectively led to desired outcomes.

Below are key comments from questionnaire and interview respondents:

- The project enhanced the basic data collection for the geospatial database of Makassar City into an integrated platform where the public can access spatial decision-making.
- The most significant contribution of the project was the improvement of the technical capacities of Mongolia, Sri Lanka, and other Asian countries, which are now able to use geospatial techniques to monitor droughts, floods, and crops. These improvements have helped the respective countries take steps forward in achieving the UN's SDGs.
- The most significant results were the design guidelines and organization of workshops to improve members' understanding of downloading satellite and shapefile data, preprocessing (e.g., project and atmospheric correction), and analyzing data with QGIS. Based on SDG 6, we (Interviewee's organization) take our method to help them monitor their local water quality and resource. Thus, we facilitated the calculation of indicators in the SDG for monitoring water quality and resources.

Box A: A Case Study in Makassar

Makassar, Indonesia, has made significant progress in adopting integrated platforms and tools for geospatial information applications. The city has implemented various smart city applications, such as interactive dashboards with geospatial information and decision support tools, flood monitoring using cloud computing and big Earth data, and COVID-19 pandemic mapping and tracking using cloud computing and information dashboards. Makassar is an exemplary model for other cities to follow in enhancing their institutional capacities to address geospatial information applications in SDG implementation. This can also increase awareness of the role of space and geoinformatics technology in policy development and planning.

The project in Makassar is also sustainable. For instance, a pilot project of mapping urban slum areas in Makassar using satellite imagery to determine eligible recipients for government social assistance was implemented after the project. The successive project aims to use remote sensing data to identify slum areas and present the data on open-access platforms to support stakeholders in decision-making. Makassar is also the best case model in terms of various evaluative aspects.

EQ2： How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?

Finding 2: Despite the impact of COVID-19 on direct outreach by international project partners, the project successfully overcame this challenge by engaging local experts and institutions, which maximized online benefits and enabled the project to meet its targets.

As travel restrictions imposed by the pandemic led to the postponement of several planned activities, many meetings and communications were compelled to adopt a digital format. This change affected the frequency, depth, and efficacy of these exchanges.

Despite the COVID-19 pandemic's challenges, for instance, the Secretariat persevered in strengthening the Pacific sub-region's capacity to utilize geospatial information for resilient and sustainable development. This determination was exemplified by the successful completion of project activities and the involvement of experts from Fiji, Solomon Islands, Papua New Guinea, and Vanuatu in both in-person and virtual training events.

The respondents deliberated on the challenges and advantages of providing training during the COVID-19 pandemic, with an emphasis on the implementation of online training. A considerable number of respondents mentioned that the pandemic hindered their ability to conduct in-person training and meetings, and they felt that online interactions were less effective than face-to-face encounters. Furthermore, issues related to bandwidth and internet speed posed challenges for certain countries.

Nonetheless, online training can be more cost-efficient when catering to a smaller group of participants. To enhance direct communication, the frequency of virtual meetings was increased, and assignments were tailored to aid participants in comprehending the workflow and guidelines. This hybrid approach enabled the project to extend its reach to a broader audience, encompassing individuals who were not initially involved.

Below were some extracted comments from interviews and questionnaire survey respondents:

- Because of the pandemic, there could have been a delay in terms of implementation efficiency; however, the project was able to reach more participants owing to the hybrid setup, and it was able to connect with people who were not initially part of the project.
- Online workshops have also been conducted. Face-to-face meetings may not always be necessary, but some parts are needed for the content. The benefits of online meetings include saving travel costs and allowing for simultaneous work on multiple projects.
- Long-distance travel was not possible because of the pandemic and planned workshops and training sessions could not be conducted, which made communication less effective. There is also a language barrier to online English communication.

Both desk reviews and surveys confirmed that the expected outputs had been achieved, and these outputs have led to the desired outcome of maximizing the benefits of online training activities and minimizing the negative impacts of not conducting training and meetings in person.

4.2 Relevance

EQ3：To what extent was the project designed based on demand from the target beneficiaries?

Finding 3: The project is aligned with the 22nd ICC's recognition of regional demands, fostering effective partnerships with other United Nations agencies and external partners while supporting countries through sharing satellite-derived data, tools, products, information, expertise, and capacity-building initiatives.

Geospatial data was crucial in specific sectors such as infrastructure, agriculture, and urban

development. By integrating geospatial data with social, economic, and environmental information, we could understand often-overlooked interconnections and ground-level impacts. For instance, Earth observation satellites has captured data that provide synoptic coverage over a vast area, offering reliable tools for assessing geo environmental catastrophes for effective disaster management. In addition, multi-date satellite imagery has allowed government officers and researchers to monitor and record changes over time, which would be critical for comprehending the impacts.

Based on the above-mentioned recognition, the 22nd ICC (2018) reiterated the necessity to support countries by sharing satellite-derived data, tools and products, information, expertise, and capacity building to tackle the challenges and contribute to resilient and sustainable development in the region. The committee also emphasized the importance of partnerships with related organizations.

Taking this evidence into account, the project included smart city applications, flood monitoring, drought monitoring, and COVID-19 pandemic mapping and monitoring that were fully aligned with regional demands. Simultaneously, it addressed the requirements of the targeted countries.

Respondents from Indonesia pointed out that local government offices did not adequately employ geospatial information before the project. They also highlighted the project outputs/outcomes in the cities of Bandung and Makassar, demonstrating the advantages of utilizing updated satellite data as results.

The questionnaire survey showed the project's relevance evaluated by the respondents. Specifically, 18 respondents (64.3%) strongly agreed and 8 respondents (28.6%) agreed with this assessment. The details of the organizational differences suggested that the government and academic sectors have a significantly positive perception of the project's relevance. These facts are presented in Annex 5.

The interviews revealed the relevance of the project. The key comments from the respondents were summarized below.

- During the meeting with pilot countries, the city emphasized the demand for innovative solutions due to scattered and unorganized data.
- The project offered a unique opportunity to process geospatial data in detail, which helped interviewees realize their significant contribution to the government.
- This experience was gained during projects in Bandung and Makassar, where local government offices did not effectively utilize geospatial information.
- This project demonstrated the benefits of using updated satellite data and highlighted the potential advantages of this technology in Indonesia.

These findings indicate that the project was highly relevant based on the demands of the target beneficiaries for implementing the project.

EQ4 : What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States?

Finding 4 : Despite the challenges posed by COVID-19 and the new priorities of member States, the project design remained unchanged, and since the project was awarded a one-year extension due to the innovative and complex nature of the planned activities as well as the pandemic-related delays, it successfully completed all planned outputs.

The COVID-19 pandemic, which has ravaged the region, has had a profound impact on the implementation of planned in-person and hands-on training and meetings, resulting in considerable disruptions. Compounding this was the challenge of poor Internet connectivity in developing countries, even in the residential areas of officials and experts, thereby heightening the complexity of online training and meetings. Furthermore, restrictions on international travel imposed on both trainers and participants exacerbated delays in project implementation. In response to these

obstacles, an agile solution was implemented by adapting to virtual meetings and follow-ups with partners, which proved instrumental in addressing these pressing challenges.

The evaluation also found that the data design task of the project experienced a minimal impact from COVID-19, unlike the project's training and meeting activities. Instead, noteworthy insights emerged due to members' familiarity with online environments.

The questionnaire and interview survey respondents mentioned that COVID-19 travel restrictions caused the project to take longer than expected, and onsite training had to be shifted to online training. This shift decreased the project's effectiveness, postponed planned activities, and made it challenging to invite appropriate participants and experts. However, the pandemic did not significantly impact the technical aspects of the project design stage.

Below are key comments from respondents:

- The project began before the COVID-19 pandemic; therefore, its impact on the project for technical aspects was negligible. The common data format developed in this study is relevant and can support studies related to COVID-19.
- The project took longer than expected due to travel problems caused by COVID-19. The pandemic has forced us to shift from on-site to online training.
- The inability to travel and organize physical meetings/training workshops decreased the effectiveness of the project and postponed the planned activities.

Finally, an extension was made for 12 months, postponing project termination to complete the project activities and leading to sufficient outcomes.

4.3 Efficiency

EQ5 ： To what extent did the project achieve efficiency in implementation through the combination of project stakeholders involved, making use of comparative advantages and the creation of synergy?

Finding 5 : The success of the project, spearheaded by ESCAP, was contingent upon the active involvement and support of a diverse group of international and local partners, including but not limited to national space agencies, the private sector, local universities, and city governments.

The activity involved conducting a comprehensive assessment of existing metadata information and standards across the Asia-Pacific region. Through active participation and feedback from target countries, common data formats were identified and incorporated into the proposed metadata framework. The project also analyzed sectoral correlations and trends within the target countries that were closely aligned with the thematic areas of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development. These identified sectors and trends included smart cities, drought and flood mapping, and pandemic mapping and monitoring based on feedback from target countries. A guideline on the common data format was subsequently developed, reviewed, and revised for the identified sectors and trends before being disseminated to relevant forums for further awareness and acceptance. The project culminated in a series of capacity-building activities that equipped experts and officials from the pilot countries of Indonesia, Mongolia, Kazakhstan, and Thailand with tools for developing integrated platforms and smart city applications, flood monitoring, drought monitoring, and COVID-19 pandemic mapping and monitoring. Makassar, Indonesia, has demonstrated exceptional leadership in utilizing geospatial information applications for SDGs implementation by actively involving various stakeholders to ensure efficiency. By fostering strong collaborations among government space agencies, local universities, and local governments. This inclusive approach, including other pilot cities such as Bandung in Indonesia and Songkhla in Thailand, focusing on stakeholder engagement, has significantly contributed to the project's efficiency and also long-term perspectives, paving the way for resilient, and sustainable development in the region.

The interviews indicated that the government had learned important lessons and tools from the project they were considering adopting. Government agencies, local governments, and academics worked closely together throughout the project. Other interviews indicated that a Chinese company that functions as both a business and academic research station promoted collaboration between the government, private sector, and academia.

The questionnaire survey indicated the project implementation's efficiency, with stakeholders strongly agreeing (14:50.0%) and agreeing (12:42.9%)[2]. These differences suggested that the academic sector and female members are relatively positive. These data are presented in Annex 5.

Below were the extracted key comments from respondents:

- The platform designed for the project was currently in use and has encouraged the sharing of updated geospatial data between offices, which was previously difficult.
- The involvement of stakeholders in the pilot cities was highlighted as a key part of the project.
- The stakeholders effectively interacted with each other in Thailand, whereas Sri Lanka utilized technology to involve stakeholders in the project.
- The city, experts, and local authorities have shared information effectively.
- Different parties have been reported to play different roles in projects and enhance collaboration.

EQ6： To what extent has partnering with other organizations enabled or enhanced the reaching of results?

Finding 6 : The coordinated efforts of the stakeholders were instrumental in driving the project forward, and their unwavering commitment to the project's objectives proved invaluable to its success.

The project was successfully executed through collaborations with various organizations and can be categorized into three primary components: Design and Technological Consultation, Implementation, and Facilitation.

In the area of design and technological consultation, prominent international academic institutions and Chinese national institutes played crucial roles. These included the Asian Institute of Technology (AIT), National Remote Sensing Center of China, Institute of Remote Sensing and Digital Earth (RADI) of the Chinese Academy, Beihang University, and the Chinese University of Hong Kong (CUHK).

As for implementation, the central players were national space agencies, local governments, and universities, which worked together to bring the project to fruition.

Lastly, facilitation was primarily driven by the UN and various international organizations, which served as a central hub. These organizations comprised UNITAR's Operational Satellite Applications Program (UNOSAT), United Nations Global Geospatial Information Management (UN-GGIM), Asia-Pacific Space Cooperation Organization (APSCO), and Geoscience Australia.

These partners were instrumental in the successful implementation of the project by facilitating joint project activities for capacity building, promoting cross-participation, sharing knowledge and technical resources, and providing expert advisory services.

Respondents from China mentioned that the most successful aspects of their studies were capacity building and working with partners in Thailand and Indonesia. In Indonesia, a dashboard was set up for urban city planning using GIS applications for COVID, drought, and smart city planning. Through capacity building, the respondents established a common data format and trained the participants to use GIS tools effectively.

[2] (Numbers of respondents who select the options: the proportions)

The questionnaire survey showed the project implementation partnership without ESCAP, strongly agreeing (18:64.3%) and agreeing (9:32.1%)[3]. The details of these differences suggested that female respondents provided highly positive answers. These data have been presented in Annex 5.

Below were some extracted comments from respondents:

- Created a platform where people from different backgrounds come together to collaborate.
- The most successful facets of our (agency's staff) study encompassed capacity enhancement and collaboration with partners in Thailand and Indonesia. In particular, within Indonesia, we developed an urban planning dashboard utilizing GIS applications tailored for COVID response, drought management, and intelligent city design. By fostering capacity development, we instituted a common data format and educated participants in the proficient use of GIS tools.
- The interviewees suggested that the project successfully provided relevant information to various stakeholders, and stakeholder partnerships aided in the effective achievement of results.

4.4 Sustainability

EQ7 ： To what extent can results of the project be continued without ESCAP's further involvement?

Finding 7: The project generated support from space agencies and pilot cities' leadership and thus enhanced the skills of local experts. Additionally, it built a strong foundation for ensuring the Asia-Pacific Plan of Action on Space Applications for Sustainable Development, which can be maintained with or without ESCAP assistance, despite financial constraints and the need for continued effort.

The Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030) has offered a structure to ensure the longevity of project activities beyond the project timeline.

To ensure sustainability and effective knowledge management, the ESCAP secretariat leveraged the momentum generated by the project to execute similar initiatives in Indonesia and Thailand, building the institutional capacity to integrate and utilize spatiotemporal data for local SDG monitoring and decision-making. Furthermore, the valuable insights, practical knowledge, and experiences garnered from the project continue to be disseminated through diverse channels, including an online dashboard (geospatial good practices dashboard), the biennial Compendium on geospatial practices for sustainable development and various ESCAP publications, the UN-GGIM-AP website, and the RESAP network.

Respondents from China mentioned that experts provided guidance and monitoring for a pilot drought monitoring project in Mongolia with the goal of having the project run independently by the partner government agency. They highlighted that the project was part of South-South cooperation and focused on providing specific solutions for the needs of pilot country, rather than just general assistance. They used open-source technology and prioritized its application over the technology itself. An interviewee from Mongolia conveyed their eagerness to collaborate with neighboring nations in addressing the shared challenge of drought-related issues.

Indonesian respondents indicated that the project improved the country's data processing and spatial monitoring capabilities, particularly in the comprehensive use of statistical and spatial data for calculations and modeling. For instance, Bandung, a pilot city in Indonesia, successfully completed two indicators: traffic accidents and hospital coverage. By effectively combining statistical and spatial data, they calculated indicator results and conducted a detailed analysis.

The questionnaire survey explained the sustainability of project implementation without ESCAP, strongly agreeing (13:46.4%), agreeing (9:32.1%), and no opinion (5:17.9%)[4]. The details of the differences suggest a shallow agreement between the academic and government sectors. These data

[3] (Numbers of respondents who select the options: the proportions)
[4] (Numbers of respondents who select the options: the proportions)

have been presented in Annex 5. The details of these differences suggested that female respondents provided highly positive answers.

Below were extracted comments from respondents on sustainability:

- As a government agency, we have particularly observed transformations within the emergency management organization concerning governmental response strategies.
- Interviewees mentioned creating opportunities for young scientists to participate in larger projects in pilot areas. They suggested introducing competitions to call for participation and provide solutions.
- By introducing data integration and SDG indicator calculation methods through training and workshops, members from the pilot cities can clearly understand these methods and monitor their local water quality and resources. A combination of geographic information can yield more accurate spatial assessments.
- This project provided solid evidence to convince the Research and Development Department to grant a new national research program on the key technologies of SDG decision-making based on integrated geospatial information. Additionally, more sectors and groups have realized the importance of geospatial information in SDG implementation, which may increase investments in relevant research and development.

4.5 Gender and human rights mainstreaming

EQ8： To what extent were gender and human rights integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis?

Finding 8 : Although the project had a technical focus and limited time available for implementation, the evaluation found that the project made efforts to integrate gender and human rights concerns into project implementation.

The project was assigned a Gender Marker 1 (GEM1) status, signifying that gender considerations were integrated into its objectives and implementation. In particular, the project aimed to encourage women's involvement in using space-derived data and geospatial information applications, which have traditionally been male-dominated fields. To accomplish this, the project made a deliberate effort to invite a greater number of female experts to participate in training courses and contribute to the analysis, monitoring, and research on land use and management. Consequently, approximately 35% of the attendees at the capacity-building events organized under the umbrella of the project were women, as depicted in **Figure 2.** The activities related to geospatial databases and dashboards have demonstrated high female participation rates.

The project also sought to benefit vulnerable and marginalized groups by improving their access to standardized land-related information. This has been crucial to ensure social and economic development, food security, empowerment, and protection from violence and health hazards. The project has developed smart cities and drought- and flood-related applications that would help improve access to such information. Furthermore, the project provided support to participants from vulnerable and marginalized groups to attend regional training and workshops where they could learn about the utilization of space-derived products and information for disaster risk management.

Through these measures, the project promoted the use of space-derived data and geospatial information applications for the benefit of all, regardless of gender or other social identity factors. **Figure 3** shows the geographic distribution of the training participants from each subregion and their contributions.

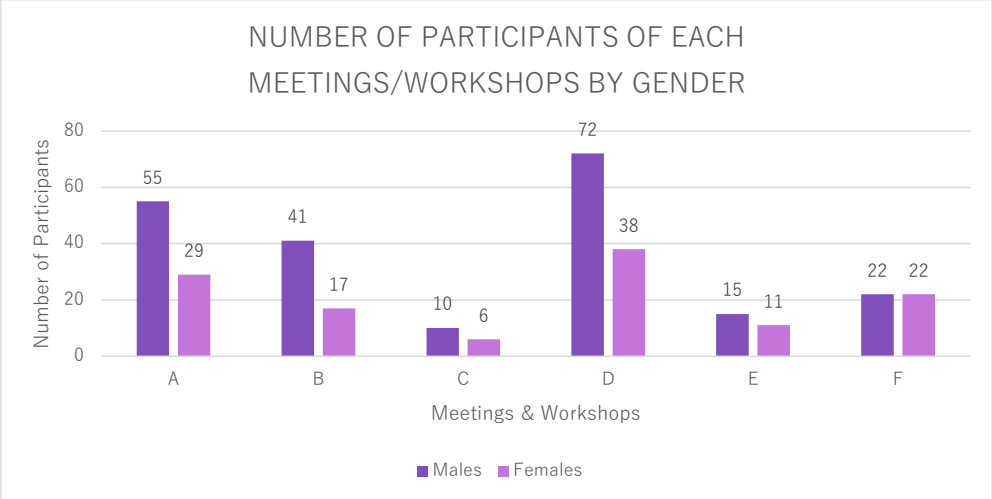
Interviewees mentioned that diverse teams should continue to be encouraged to participate in projects as they bring different perspectives and improve outcomes.

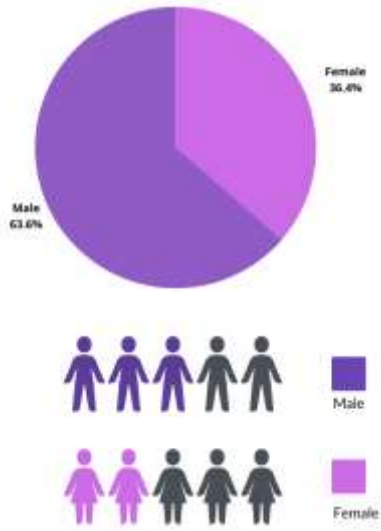
The questionnaire survey indicated implementation of the project's gender and human rights mainstreaming, strongly agreeing (6:21.4%), agreeing (9:32.1%), and no opinion (13:46.4%)[5]. The details of these differences suggested that no opinion was dominant, primarily in academic and governmental sectors. Annex 5 has presented the data.

Below were some extracted comments from respondents:

- The individuals interviewed highlighted that technology has the potential to address fundamental living necessities, including food, water, and clean air. Furthermore, it can offer people greater opportunities to comprehend and tackle their own issues. We (government agency) highlighted the significance of incorporating human rights into the core of the project, while also guaranteeing inclusivity across all genders and socioeconomic backgrounds. Furthermore, the project aims to foster economic growth for the benefit of all involved.
- The project's design in Indonesia integrated gender and human rights considerations.
- Drought monitoring has helped save lives in Mongolia, benefiting various social groups.

Figure 2

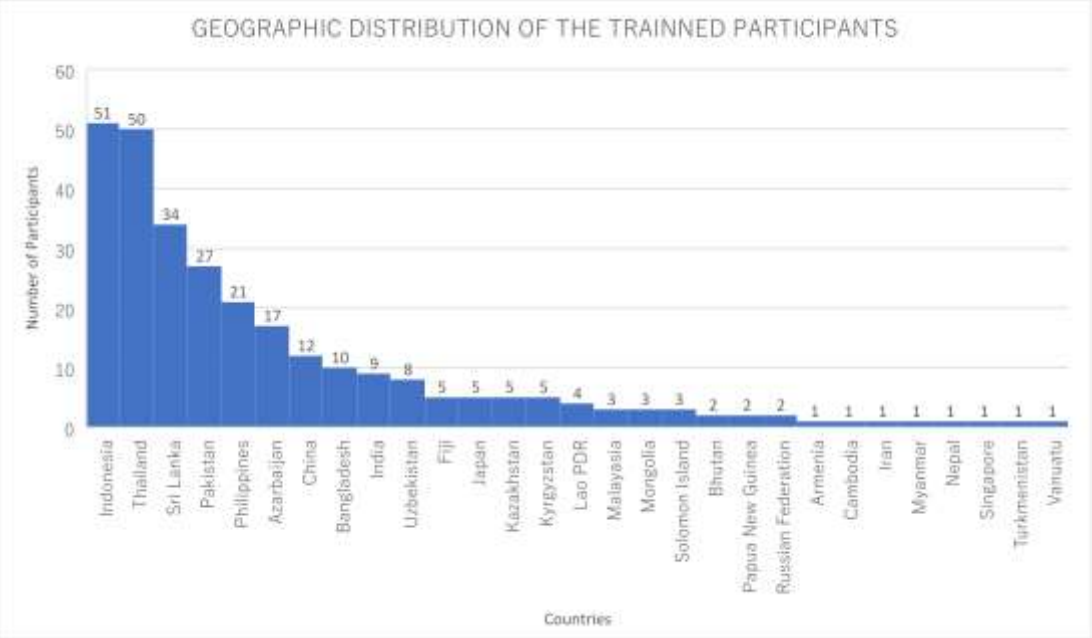




A: A regional expert meeting;
B: ICC-RESAP;
C: A training workshop on geospatial information platform;
D: Training on Google Earth Engine Could computing platform;
E: A hybrid training on Web-GIS-based smart city application in Makassar;
F: A hands-on training on geospatial good practices database and dashboard

[5] (numbers of respondents who select the options: the proportions)

Figure 3


GEOGRAPHIC DISTRIBUTION OF THE TRAINNED PARTICIPANTS
Number of Participants
Countries
60
50
40
30
20
10
0
51
50
34
27
21
17
12
10
9
8
5
5
5
5
4
3
3
3
2
2
2
1
1
1
1
1
1
1
1
Indonesia
Thailand
Sri Lanka
Pakistan
Philippines
Azarbaijan
China
Bangladesh
India
Uzbekistan
Fiji
Japan
Kazakhstan
Kyrgyzstan
Lao PDR
Malaysia
Mongolia
Solomon Island
Bhutan
Papua New Guinea
Russian Federation
Armenia
Cambodia
Iran
Myanmar
Nepal
Singapore
Turkmenistan
Vanuatu

5. Conclusions

The project's greatest achievement was the creation and application of a common data format for pilot cities, which provided a method for implementing resilient and sustainable development policies and programs and strengthening regional cooperation to ensure effectiveness. This project was highly relevant for achieving various UN mandates, SDGs, and the Asia-Pacific Plan of Action on Space Application for Sustainable Development (2018-2030). The evaluation revealed that engaging stakeholders in a participatory approach effectively catered to their needs.

In terms of efficiency, the evaluation found that the project demonstrated adequate partnerships with stakeholders from diverse organizations and areas of expertise; the ESCAP took advantage of virtual outlets and arenas to expand partnerships outside the region.

Owing to the proficiency, fervor, and dynamism exhibited by ESCAP personnel in advancing SDGs, the project's invaluable insights, pragmatic skill, and experiences were disseminated through a diverse array of channels, such as an online dashboard, biennial compendium, ESCAP publications, the UN-GGIM-AP website, and the RESAP network to contribute to the project sustainability.

The evaluation confirmed that the project integrated mainstream gender and human rights into its design and implementation. Stakeholders benefited from technology, knowledge, and field applications through the project and contributed to sustainable development.

Project Evaluation Ratings

Table 2

Criteria	Rating
Effectiveness	Very High
Relevance	Very High
Efficiency	Very High
Sustainability	High
Gender and Human Rights mainstreaming	High

Table 2 has presented the evaluation ratings for each criterion. The project demonstrated very high effectiveness, with outstanding results and strong relevance due to beneficiary demand. Despite pandemic challenges, its focus and adaptability has remained unwavering. Efficiency was boosted by partnerships and collaborations, garnering a very high score. Sustainability was rated high, but some target countries still require ESCAP's presence. The project excelled in gender and human rights integration, yet expansion of these principles to more stakeholders is needed. Annex 6 has provided a detailed breakdown of the evaluation ratings.

6. Lessons learned/good practices

In this section, the various challenges and lessons learned related to this project have been presented. These challenges included data integration, the effectiveness of online training with many participants, and inadequate bandwidth or Internet speed in some countries. Despite these challenges, the evaluation revealed several good practices and positive transformations for the project's target beneficiaries that could be applied to future activities. There were two major lessons learned with good practice.

Overcoming Challenges in Data Integration for Practical Use

Despite the successful experience of the project in several countries in Asia and the Pacific, challenges remained in terms of data integration for practical use. These challenges include ensuring that data is accessible, available, actionable, and affordable to benefit people. To address these challenges, strategies such as rapid data collection and integration, connecting data with policy implementation and action, guaranteeing data privacy, and fostering collaboration with the public on data collection and access are essential for continued success in data integration efforts. However, the successful implementation of the project served as the first step towards overcoming these challenges. To further address these issues, ESCAP has designed "Space +", which goes beyond traditional space application approaches.

Navigating Post-Pandemic Challenges and Opportunities

Evaluations in the post-pandemic world have focused on the impact of COVID-19 on the project. It has highlighted the negative impact of travel restrictions on physical meetings and workshops with pilot countries, the need to adjust communication methods, the challenges of language barriers and local knowledge, and the difficulty of organizing in-person expert participation. Despite these challenges, the evaluation revealed some positive outcomes, such as the successful use of cloud platforms for capacity building and the acquisition of basic knowledge of geospatial applications.

7. Recommendations

Recommendation 1: Further disseminate the knowledge and tools developed by the project.

The evaluation recommends further dissemination of knowledge and tools, such as creating common data formats and guidelines developed by the project and promoting Space+ and 4As (available, accessible, affordable, and actionable) for geospatial information in line with local needs. To enhance the wider dissemination of results and deliverables, ESCAP could utilize not only its official portal but also capitalize on collaborations with external entities (e.g., NGOs, academic institutions, and international organizations) that could actively participate in the dissemination and promotion of knowledge and tools within their respective networks.

Recommendation 2: Strengthen communication and cooperation mechanisms by fostering online and offline platforms.

The harmonization of technological advancements, knowledge, and implementation could be achieved by enhancing communication and cooperation mechanisms and by constructing and expediting both online and offline platforms among diverse stakeholders in alignment with the Plan of Action on Space Applications for Sustainable Development in Asia and the Pacific (PoA). These platforms should be geared toward a unified direction.

Recommendation 3: Consider the value of all project members by ensuring diverse stakeholder representation, including gender, youth, and the private sector, and promotes sustainability.

Considering the contributions of all the project members, it is evident that diverse stakeholders could be well represented, ensuring a balanced distribution across various sectors. This inclusive approach encompassed gender, youth, and private sector engagement, fostering a collaborative environment. All stakeholders could receive proactive education on the PoA and the UN mandate facilitated by the secretariat.

Recommendation 4: Promote and conduct on-site training and involve participants with diverse backgrounds and agencies in capacity-building activities.

To ensure effective knowledge and technology transfer, a combination of on-site training and online settings should be promoted, considering the knowledge and technology stages of the stakeholders. Additionally, the participation of more diverse types of stakeholders, including youth and the private sector, has been expected to maximize the total social benefits.

Recommendation 5: Continue maximizing geospatial information potential through user-tailored platform development and multi-sector engagement.

Geospatial information has a significant potential to enhance the lives of local communities. To maximize its effectiveness, it has been crucial to increase its accessibility and usefulness to both the public and government authorities. Based on the evaluation feedback, developing a mobile phone platform could be an example recommendation to effectively expedite the practical application of geospatial information to everyday users. Furthermore, the platform could serve as a valuable tool for engaging younger generations and fostering its widespread adoption and utilization across various societal sectors.

Recommendation 6: Support the sustainability of initiatives in pilot cities and work towards extend its impact beyond pilot countries.

This recommendation highlights the importance of continually incorporating diverse expertise and fostering collaborative innovation to promote sustainability in pilot cities and beyond. Establishing strong partnerships with space agencies and pilot city leadership is crucial for enhancing local skills and effectively supporting the Asia-Pacific Plan of Action. Moreover, exploring alternative funding strategies is critical for ensuring long-term project viability and success. It is imperative to empower stakeholders to lead systemic change, further advancing sustainable development, even in the absence of ESCAP's direct support.

ANNEXES

Annex 1: Evaluation TORs

Annex 2: Evaluation matrix

Annex 3: Data collection instruments

Annex 4: List of interviewees

Annex 5: Questionnaire's Results

Annex 6: Evaluation Ratings

Annex 7: List of documents reviewed

Annex 1: Evaluation TORs

Terms of Reference
Evaluation of Extrabudgetary-funded Project

Improving the use and sharing of geospatial information for resilient and sustainable development in selected pilot countries

Information and Communications Technology and Disaster Risk Reduction Division
ESCAP

1. INTRODUCTION

Geospatial data have high relevance for certain sectors, notably, infrastructure, agriculture and urban development. Such data allows social, economic and environmental data to be linked to time and location attributes in cost-effective ways. This project, *"Improving the use and sharing of geospatial information for resilient and sustainable development in selected pilot countries",* aimed to build guidelines that would serve as point of entry for the storage, access and retrieval of geospatial data and information in a common format. This would contribute to the definition and description of a future information repository that will facilitate data sharing between end-users, providing them with crucial and commonly formatted information for better decision-making.

The evaluation will assess, inter alia, the relevance and effectiveness of the project, and support future project design through lessons from implementation. The evaluation is expected to begin in Nov 2022 and continue for about three months.

2. EVALUATION PURPOSE, OBJECTIVES AND SCOPE

2.1 Evaluation Purpose

The purpose of the evaluation is to support accountability for results and to enable learning. It will generate information on the results achieved and lessons learned to inform future programme design and implementation of relevant ESCAP capacity development work. The main users of the evaluation results will be ESCAP, particularly the implementing division(s). Other expected users include the project participating countries and implementing partners.

2.2 Evaluation objectives

The objectives of the evaluation are to:

1) Assess the project performance against the evaluation criteria: effectiveness, relevance, efficiency, sustainability, gender and human rights mainstreaming, and any other cross-cutting issues, as deemed relevant.

2) Formulate lessons learned and action-oriented recommendations to inform management decision-making and improve future project design and implementation.

The evaluation analyses the level of achievement of project results, making use of the project's results framework, implementation processes and contextual factors, establishing as much as possible causal linkages guided by the evaluation criteria and questions. The evaluation will be conducted in line with ESCAP Monitoring and Evaluation Policy and Guidelines[6] and the United Nations Evaluation Group (UNEG) norms and standards for evaluation.

2.3 Evaluation Scope

The evaluation includes the design, strategy and implementation of the project over the entire period of its implementation. The evaluation covers the implementation and results of the project in the participating countries. The assessment covers all modes of implementation of the project, including national and regional workshops, training and additional activities as agreed upon based on consultations with project countries.

[6] ESCAP, ESCAP Monitoring and Evaluation Policy and Guidelines, 2017, available on the ESCAP webpage at http://www.unescap.org/partners/monitoring-and-evaluation/evaluation.

The evaluation is expected to cover the full duration of the project from March 2019 to February 2022. Target countries include Thailand, Cambodia, Indonesia, Kyrgyzstan, Mongolia, Fiji, Bangladesh, Bhutan and Sri Lanka.

2.4 Evaluation Criteria and Questions

The following evaluation criteria and questions to assess the project performance will be considered and further refined following consultations with project management and other stakeholders during the evaluation inception period.

Evaluation criteria	Evaluation questions
Effectiveness	• What were the most significant results[7] at the regional and national levels achieved or contributed by the project? Describe the project activities/outputs that lead to the results and present evidence of project's contribution to the results. • How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?
Relevance	• To what extent was the project designed based on demand from the target beneficiaries? • What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States?
Efficiency	• To what extent did the project achieve efficiency in implementation through the combination of project stakeholders involved, making use of comparative advantages and the creation of synergy? • To what extent has partnering with other organizations enabled or enhanced reaching of results?
Sustainability	• To what extent can results of the project be continued without ESCAP's further involvement?
Gender and human rights mainstreaming.	• To what extent were gender and human rights integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis?

[7] In the context of this evaluation, results are assessed at the outcome level. Outcome level results are the likely or achieved effects of an intervention's outputs. They reflect the changes in the behaviour or practices of the target group(s)/countries that ESCAP intends to influence, including through actions taken collectively with its development partners. They also reflect that benefits and actions taken by the target groups/countries through the project interventions (source: ESCAP Monitoring and Evaluation Policy and Guidelines). Examples of outcome level results include: (1) Five pilot countries adopted and implemented national strategies and programmes with assistance from the project; (2) Several countries put in place a new system or procedures with support from the project; (3) Countries organised national workshops as a follow-up to the project training activities.

3. PROJECT OVERVIEW

The key objective of the project was to enhance the use and application of geospatial information applications for resilient and sustainable development in Asia and the Pacific. The project aimed to enhance the capacity of member States to use geospatial data towards resilient and sustainable development, particularly in the areas of disaster management, energy, ICT, and transport infrastructure, as well as urban planning in support of the implementation of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030).

The project was implemented in a group of pilot countries, selected from members of ESCAP's Regional Space Application Program (RESAP) which have expressed interest and demonstrated geospatial absorptive capacity. The project adopted the following implementing strategy and results framework:

a) Leverage the geospatial expertise available through RESAP's service nodes, ESCAP's existing partnership with UNITAR/UNOSAT, as well as work underway in the UN-GGIM, Asia-Pacific chapter.
b) Collaborate with the private sector to widen and diversify the sources of data supply.
c) Collaborate with academia and geospatial specialists who will develop guidelines for common data formats and data sharing methodologies.
d) Work with selected pilot countries to verify the guideline and data format.

Project results	Indicators	Means of Verification
Project outcome: Target stakeholders use the data and knowledge products to inform more effective implementation of the Asia Pacific Plan of Action on space applications for sustainable development	▪ At least 1 target country from each subregion (4) indicates that they have used the geospatial information applications.	▪ Participants feedback from questionnaire surveys ▪ Institutional assessments
Output: Target stakeholders have access to geospatial data and knowledge products to support the Asia Pacific Plan of Action on space applications for sustainable development	▪ By the end of the project, a set of process guidelines has been drawn up and a framework of common data formats are agreed to. ▪ By the end of the project, the guidelines would provide pilot countries with step-wise approach towards access to geospatial data and information ▪ Institutional access to geospatial data and information provided.	▪ Through country level consultations with relevant agencies and reflected in a final report.

Key activities:

A1: Review of the existing metadata information to identify common data formats to be included in the proposed metadata framework made available online through a cloud-based portal.

A2: Analyze sectoral correlations and trends and prepare an analytical document on geospatial information applications and its support for the 2030 Agenda as captured in the Asia Pacific Action Plan on space applications for Sustainable Development.

A3: Produce guidelines on common data formats with the consideration of what kind of operations are associated with geo-data objects and develop common methodologies to identify sector specific needs of the member States.

A4: Disseminating the guidelines to relevant fora for further awareness and acceptance.

A5: Organize two regional expert meetings in Bangkok to agree on the common data formats and the procedural guidelines.

A6: Organize three capacity development workshops in pilot countries (Indonesia, Bangladesh and Mongolia)

4. OVERALL EVALUATION APPROACH

In assessing the results achieved, the evaluation will make use of a theory of change approach to understand the actual results achieved and the process of achieving results. The development of the theory of change should be guided by the results framework of the project and the actual implementation strategy and delivery of outputs.

The evaluation will apply a mixed-method approach through a combination of quantitative and qualitative analysis to inform findings. Due to the ongoing travel restrictions and health concerns caused by the COVID-19 pandemic, which are likely to persist for the remainder of 2022, the evaluation methodology will rely primarily on desk review and remote data collection methods. The evaluation will apply multiple methods, and cross-check information and data from different sources to ensure confidence in the findings.

The evaluation process will involve several phases as outlined below:

Phases
a) **Inception and scoping phase** • Preliminary review of documentations • Interviews with members of the reference group and other project stakeholders to understand their expectations and requirements • Preparation of an evaluation inception report detailing the evaluation scope, questions, methodology and workplan • Meeting with the evaluation reference group to present the inception report and seek clearance to proceed • Preparation of questionnaires and interview guides
b) **A desk review of project documents.** The following documentations will be provided to the consultant • Name of the project team members and their respective roles • List of stakeholders to be interviewed • Project publications, research papers, training materials • Press releases • Project meeting information (e.g. attendance lists, minutes/reports, agenda, handouts, questionnaire results) • Mission reports • Project document, including the work and monitoring plan, logical framework and budget • Relevant agreements (e.g. with the project partners) • Project revisions (if applicable) • Progress reports, including documents referred to in the report • Project terminal report, including documents referred to in the report
c) **Surveys of project stakeholders (electronic)** • An electronic survey will be administered targeting government officials and implementing partners • Development and administration of the survey by the consultant • Data analyses
d) **In-depth individual interviews (in person/video/audio call)** • Governmental stakeholders • Development partners

	• Project management
e)	**Focus group discussions (video conference)** • If needed, the consultant may conduct in-depth discussions with selected stakeholders on certain specific topics or issues
f)	**Preparation of the evaluation report and presentation of findings** • Preparation of a brief note containing the preliminary findings, conclusions and recommendations of the evaluation • Meeting with the reference group to present (using PowerPoint) and discuss the preliminary evaluation results • Preparation of a draft evaluation report and review of the draft report by the evaluation reference group • Finalization of the evaluation report along with an evaluation brief (3-page summary) following a standard format to be provided by ESCAP

Data will be disaggregated by sex and other relevant social categories. The evaluation will undertake a transparent and participatory evaluation process that will involve male and female stakeholders identified in the stakeholder analysis, including: the reference group, development partners and target beneficiaries in all key evaluation tasks.

In analyzing the data, the evaluation will use qualitative and quantitative approaches, and provide charts and direct quotations. Using the data to assess evaluation against the selected criteria. Gender and human rights mainstreaming are essential components of data analysis in all ESCAP evaluations and take place on three levels: 1) project design; 2) project implementations; 3) project outcomes. Data analysis will enable useful, evidence-based findings, conclusions and recommendations.

The evaluation methodology will also take into consideration the ethical principles in evaluation as detailed in the UNEG ethical guidelines for evaluation.

5. ROLES AND RESPONSIBILITIES

5.1 Evaluation reference group

To support the independence of the evaluation, the Evaluation Unit, SPMD will manage and oversee the entire evaluation process. An evaluation reference group will be established to support the evaluation and will comprise the following members, the Director/Section Chief of the implementing division/office (Chair), Section Chief of the implementing division/office, project officer, evaluation officer from the Evaluation Unit, SPMD and additional members, including staff from partner ESCAP division/office (internal) or organization (external).

The reference group provides technical and methodological guidance to the evaluation process; reviews and approves the selection of the consultant, terms of reference and inception report; provides quality control of the evaluation report and validation of recommendations; and ensures adherence to ESCAP Evaluation Policy and Guidelines and the use of evaluation outputs, including the formulation of the evaluation management response and follow-up action plan.

5.2 Evaluator

The evaluator will assume overall responsibility for carrying out the evaluation. This includes, among other activities, managing the work, ensuring the quality of interviews and data collection, preparing the draft report, presenting the draft report and producing the final report after comments have been received in line with standard templates provided by ESCAP. The evaluator must have:

- Knowledge of the United Nations System; principles, values, goals and approaches, including human rights, gender equality, cultural values, the Sustainable Development Goals and results-based management.
- Professional and technical experience in evaluation (application of evaluation norms, standards and ethical guidelines and the relevant organizational evaluation policy and promotion of evaluation and evidence-based learning).[8]
- They should also have a good technical knowledge in the Asia-Pacific region, including major development trends and issues, particularly in the areas of geospatial science.

6. OUTPUTS

The following outputs will be delivered to the project manager at ESCAP:

1. Inception report detailing the approach of the evaluator, workplan and evaluation logical framework (see Annex 1)
2. Results of data collection exercise
3. First draft of evaluation report (see Annex 2 and Annex 3)
4. Presentation (ppt) on findings, conclusions and recommendations
5. Final evaluation report
6. An ESCAP evaluation brief

The draft evaluation report will be shared with key stakeholders prior to finalization. The final evaluation report will be posted on ESCAP's public website.

ESCAP adheres to the UNEG Ethical Guidelines and Code of Conduct in evaluation and all staff and consultants engaged in evaluation are required to uphold these standards. To this end, ESCAP has developed a Consultants Agreement form (see Annex 4) that evaluators are required to comply upon signing the consultancy contract.

7. WORKPLAN

The evaluation will be undertaken from November 2022 to January 2023. The evaluation budget includes a consultancy fee to be determined based on professional qualifications and the duration of the contract.

Phase	Timelines
1. Inception • Desk review of documentations • Interviews with members of the reference group • Preparation of an inception report for the evaluation • Presentation of evaluation methodology and tools to the reference group	November

[8] See Standard 3.1. Competencies, UNEG. 2016. Norms and standards for evaluation.

2. Data collection and analysis • Desk review of documentations • Preparation of surveys and interview guides • Administration of stakeholder survey • Interviews and focus group discussions with stakeholders • Attendance in the project final meeting • Data compilation and analysis	December
3. Report preparation and conclusion • Submit a brief report containing the preliminary findings, conclusions and recommendations • Meet with the reference group to discuss the preliminary findings and recommendations • Prepare a first draft evaluation report • Prepare a revised draft evaluation report • Final evaluation report and summary note	January

ANNEXES

Annex 1. Contents of the inception report

This report sets out the conceptual framework to be used in an evaluation and details the evaluation methodology, including the evaluation criteria and questions, indicators, method of data collection and analysis, gender mainstreaming approach and risk and limitations. It allows the evaluation team to clarify their understanding of what is being evaluated and why and to present their preliminary findings based on initial review of documents and consultation with the evaluation reference group and other stakeholders.

Nº	Report Section	Contents
1	**Introduction**	• Title of the evaluation • Very short description of the project to be evaluated • Short reason for the evaluation (will be expanded on under 2 below) • Short introduction of the context • Timing of the evaluation
2	**Evaluation purpose**	• Rationale for the evaluation, why it is needed at this time • Expected users and expected use by each of these of the evaluation results
3	**Context of the evaluation**	• Introduction of the topic of the evaluation and relevant developments concerned • Details on the topic in countries/regions covered by the project • Details on policies, plans and programmes of government and other organizations on the topic concerned and support provided by other development partners
4	**Subject of the evaluation**	• The project, its goal and objectives and how it tries to achieve these • Coverage in terms of countries / regions and time frame concerned • Partners for implementation, including government, other IEs, other UN agencies at country/regional level • Stakeholders that have an interest in the project and their interest in the evaluation • Project resources • Past evaluations / assessments / studies. including gender and vulnerability assessment

Nº	Report Section	Contents
5	**Evaluation scope, objectives and questions**	• What the evaluation will cover of the subject of the evaluation in terms of project components and activities, coverage of geographical area, time frame and otherwise • What parts of the subject, the evaluation will not cover and rationale concerned • Objectives of the evaluation, i.e. what the evaluation will accomplish, including what evaluation criteria will be covered and rationale concerned • Evaluation questions, organized by evaluation criteria, with the number of questions limited to six or seven • Inclusion of human rights, gender and the principle of 'leaving no one behind' as part of the evaluation • Evaluation scope, objectives, criteria and questions need to be reviewed in the inception phase by the evaluator and if needed adapted in coordination with evaluation manager and if applicable, the evaluation reference group
6	**Methodology of the evaluation**	• Methodological approach and rationale • Methods for data gathering and methods for data analysis • Identification of primary data gathering and rationale for country selection • Sampling of respondents for qualitative and quantitative data gathering • Data availability • Application of a human rights and gender equality approach in the evaluation • Ethical concerns and how to address these • Limitations to the methodology and ways to address the challenges identified • Evaluation methodology needs to be reviewed in the inception phase by the evaluator and if needed adapted/further developed in coordination with evaluation manager, internal evaluation management team and external evaluation reference group
7	**Organization of the evaluation**	• Evaluation process and work plan • Management issues including roles and responsibilities of implementing entity, evaluation manager, evaluation reference group and evaluator • Evaluation team composition and responsibilities • Evaluation deliverables, i.e. Draft and final Inception Report, Draft and final Evaluation Report, Evaluation brief and other tailored knowledge products as required • Security considerations
8	**Annexes** *(obligatory contents in italics)*	• *TOR* • *Detailed results framework of the project* • *Stakeholder mapping / analysis* • *Evaluation Matrix* • *Detailed evaluation schedule/ workplan* • *List of acronyms used* • *References to secondary information sources* • Additional contextual details • Additional methodological details

Annex 2. Contents of the evaluation report

CONTENT	PAGES (estimate)	COMMENTS
Title page	1	Title, date of publication Names of the evaluators Name of ESCAP or division that commissioned the evaluation
Acknowledgments	1	Prepared by the evaluation team
Table of contents	1	List of the contents of the report, including annexes, boxes, figures and tables with page references
List of acronyms	1-2	In alphabetical order, these are written out in full the first time they are used in the report
Executive summary	2-3	• The summary needs to be a stand-alone section of maximum three pages that is able to inform decision-making. • Short overview of the project, the purpose, scope and objectives of the evaluation and the intended users • Provide key aspects of the methodology, its limitations and ways in which these were mitigated. • Summarize key findings, conclusions, lessons learned/good practices and recommendations
1. Background, purpose and scope	1-3	• Background to the project and the evaluation • Very short description of the project • Evaluation purpose, objectives and scope
2. Context of the evaluation	1-2	• Introduction of the topic of the evaluation and relevant developments concerned. • Details on the topic in countries/regions covered by the project • Details on policies, plans and programs of government and other organizations on the topic concerned and support provided by other development partners
3. Subject of evaluation	2-4	• The project, its objective and how it tries to achieve this and the time frame concerned • Describe the target groups and countries and how their needs were assessed • Describe the actual implementation strategy and key partners • Project resources (staff involvement, external consultants and budgets) • Past evaluations/ assessments/ studies if relevant including gender analysis and vulnerability assessment
4. Methodology of the evaluation	1	• Evaluation questions organized by evaluation criteria • Description of methodology: including methods for data gathering and analysis, aspects of data availability and reliability of data, designed to meet the evaluation purpose, scope and objectives. • Sampling of respondents for qualitative / quantitative data gathering, rationale for country selection of primary data gathering and process of stakeholder engagement • Ethical concerns and how these were handled • Limitations: limitations of the methodology and scope and problems encountered; and ways these were mitigated

CONTENT	PAGES (estimate)	COMMENTS
5. Findings	Varying length	• Overview: supporting information for the performance assessment • Performance assessment: assessment against relevant evaluation criteria (effectiveness, relevance, efficiency, sustainability, gender and human rights mainstreaming) • Other assessment: assessment against relevant additional criteria • There is a need for a clear focus on results obtained, ways in which these have been achieved and contributions of the project
6. Conclusions	1-4	• Main conclusions, both positive and negative, of the evaluation that follow logically from the findings • Ratings table with ratings for standard evaluation and additional criteria and a brief justification (optional) • Statements beyond the level of the individual evaluation questions that are grounded in the analysis of the findings. They can be at the level of the evaluation criteria or at the level of across criteria and related to cross cutting issues and provide added value to the findings
7. Lessons learned/good practices	1-2	• Lessons learned based on the findings and conclusions. • A number of lessons that were learned in the implementation of the project and that are useful beyond the context in which they were learned, with sufficient substantiation to be of use to people who do not know the project • A number of good practices that were tried out and produced results and that can be of use beyond the context in which they were tried out, with sufficient substantiation for these to be of use to people who do not know the project • Maximum of a total of five learnings • There is a need to pay equal amounts of attention to lessons learned/ good practices as to recommendations
5. Recommendations	1-2	• Recommendations (not more than seven) based on the conclusions. Can be addressed to ESCAP management, staff, donors and other relevant stakeholders
Annexes		I. Terms of reference II. Project results framework and additional details of project III. List of documents reviewed IV. List of interviewees V. Data tables and analysis VI. Management response (to be completed by ESCAP) Other annexes as required

Annex 3. Quality criteria used to review evaluation reports

Report content	**The report is structured logically and is well written**
•	• The report follows the table of contents outlined in the TOR and includes the relevant annexes • The executive summary is 1-2 pages and highlights the key findings, conclusions and recommendations • The report uses consistent grammar and spelling in line with UN rules, written in good English and is easy to read. Main messages are clearly distinguished from the text
Purpose, objectives	**The report meets the purpose, objectives and scope of the evaluation stated in the TOR**
•	• The report gives a clear description of the object of evaluation. The expected results chain is clearly outlined. Key stakeholders are listed. • The report clearly explains the evaluation's purpose, objectives and scope, including main evaluation questions, and limitations • The report describes and explains the chosen evaluation criteria • Evaluation objectives and scope address gender and human rights
Evaluation method	**The evaluation methodology and its application are explained clearly**
•	• The methodology is clearly explained and applied throughout the evaluation process • The report describes data collection methods and analysis and consultation process • Methods are appropriate for effective gender and human rights analysis • Amendments to the methodology identified in the inception report are clearly explained • The limitations and their implications for the validity of the findings and conclusions have been explained
Findings	**The findings and conclusions are credible**
•	• Findings respond to the evaluation criteria and questions detailed in the scope and objectives section of the report • Findings are based on evidence gathered using methodology identified in the report • Findings are based on rigorous analysis, are evidence based and objective • Findings are adequately substantiated, balanced and reliable • The relative contributions of stakeholders to the results are explained
Conclusions	**Conclusions are relevant, evidence based and insightful**
•	• The conclusions derive from the findings and are evidence based • Conclusions relate to the purpose and key questions of the evaluation • Conclusions are logically connected to evaluation findings
Recommen-dations	**The recommendations are useful**
•	• The recommendations are clear and follow logically from the findings and conclusions

	• Recommendations are realistic, concrete and actionable within a reasonable timeframe • Recommendations for ESCAP should be clearly within ESCAP's mandate
Gender human rights	**Gender and human rights principles are mainstreamed**
•	• The report discusses the extent to which the project integrates gender equality and human rights perspectives in: project design, implementation and outcomes. • The evaluator collects and analyses data disaggregated by sex and other social groups. • Findings, recommendations and lessons learnt provide information on gender • The report uses gender sensitive and human rights based language.

Annex 4: Evaluation Consultants Agreement Form

Evaluation Consultants Agreement Form
UNEG Norms and Standards for Evaluation
UNEG Code of Conduct for Evaluation in the UN System

Upon signing the consultancy contract, the evaluator is an agreement to abide by the UNEG Norms and Standards for Evaluation[9] and the UNEG Code of Conduct for Evaluation in the UN System[10], specially to the following obligations, among others:

- **Independence.** Evaluators shall ensure that independence of judgement is maintained, and that evaluation findings and recommendations are independently presented.
- **Impartiality.** Evaluators shall operate in an impartial and unbiased manner and give a balanced presentation of strengths and weaknesses of the policy, program, project or organizational unit being evaluated.
- **Conflict of Interest.** Evaluators are required to disclose in writing any past experience, of themselves, which may give rise to a potential conflict of interest.
- **Competence.** Evaluators shall accurately represent their level of skills and knowledge and work only within the limits of their professional training and abilities in evaluation.
- **Accountability**. Evaluators are accountable for the completion of the agreed evaluation deliverables within the timeframe and budget agreed.
- **Confidentiality**. Evaluators shall respect people's right to provide information in confidence and make participants aware of the scope and limits of confidentiality.

[9] http://www.unevaluation.org/document/detail/1914
[10] http://www.unevaluation.org/document/detail/100

Annex 2: Evaluation matrix

Questions to be Asked	Substantiating Evidence/ Indications of Change	Source of Information	Methos for Data Collection
Effectiveness			
• What were the most significant results at the regional and national levels achieved or contributed by the project? Describe the project activities/outputs that lead to the results and present evidence of project's contribution to the results. • How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?	• Key stakeholders' comments of changes and how and why they occurred. • project reports of changes and how and why they occurred	• Project related documents, Websites; PPTs, and websites. • Questionnaire survey answers • Minutes of the interviews and focus group discussions	Triangulation of data deriving from document review, interviews, and online survey
Relevance			
• To what extent was the project designed based on demand from the target beneficiaries? • What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States? • What lessons and good practices from previous projects were used to inform project design?	• Key stakeholders' reports of changes to project design and scheduled interventions • Initial research recommendations used to guide interventions in the inception phase	• Project related documents, Websites; PPTs, and websites. • Questionnaire survey answers • Minutes of the interviews and focus group discussions	Triangulation of data deriving from document review, interviews, and online survey
Efficiency			
• To what extent did the project achieve efficiency in implementation through the combination of project stakeholders involved, making use of comparative advantages and the creation of synergy? • To what extent has partnering with other organizations enabled or enhanced	• Key stakeholders' comments on efficiencies 2. • Key project documents	• Project related documents, Websites; PPTs, and websites. • Questionnaire survey answers • Minutes of the interviews and focus group discussions	Triangulation of data deriving from document review, interviews, and online survey

reaching of results?			
Sustainability			
• To what extent can the project results be continued without ESCAP's further involvement?	• Key stakeholders' comments on sustainability • Information in project inception and research reports • Project design documents	• Project related documents, Websites; PPTs, and websites • Questionnaire survey answers • Minutes of the interviews and focus group discussions	Triangulation of data deriving from document review, interviews, and online survey
Gender and Human Rights Mainstreaming			
• To what extent were gender and human rights integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis?	• Key stakeholders' comments on gender and human rights mainstreaming • Information in project inception and research reports • Project design documents	• Project related documents, Websites; PPTs, and websites • Questionnaire survey answers • Minutes of the interviews and focus group discussions	3. Triangulation of data deriving from document review, interviews, and online survey

Annex 3: Data collection instruments: Interview guide

Interview Details	
Name, organization and position	
Gender	
Stakeholder type	
Location of interviewee	
Date and time	
Interviewer(s)	
Mode of interview	

	Questions	**Answers**
Intro	What is your role?	
	In what ways have you participated in the project?	
	Did you participate in any related expert meetings or workshops?	
Effectiveness	How did the project contribute to facilitating the implementation of sharing geospatial data? (PROBE: To what extent has the project enabled your organization/country/office to better respond to geospatial needs and increase the likelihood of achieving greater impact at country/city level? Examples?)	
	What main reasons or factors would you say account for the achievements and shortfalls/challenges to date for the project?	

Relevance	How did ESCAP engage you (your government) during the design and implementation of the Project?	
	How would you assess the integration of demands/requirements (in terms of topics covered) in the project?	
	Can you identify any lessons and/or good practices?	
Efficiency	Could you describe the cooperation between ESCAP and partner organizations/country/city offices in the meeting/overall throughout the project? Which lessons learned could be drawn from this cooperation? Would you consider that the project activities adequately engaged other development partners in discussing and promoting geospatial information sharing? What is the case with your organization?	
	Considering the Covid situation, how would you consider the timeliness of the project? Were the report and the meeting visible and well-recognized among your government/organization?	
Sustainability	Would your organization/country endorse the incorporation of geospatial information into Asia and the Pacific Plan of Action on space application Phase II (2022-2026) Would your government/organization use the best practices and recommendations on geospatial information included in the reports and meeting delivered by the project?	
Gender and human rights mainstreaming	From what you know, would you consider the project took a gender approach in the design and delivery of the report and the regional meeting?	

Data collection instruments: Online Survey Tool

1. What best describes your organization?
    a. Government agency
    b. Private Sector business / firm
    c. International / intergovernmental agency
    d. CSO / NGO / Research organization / Academia
    e. Other (Please specify)
2. What is your role / position within the organization?
3. What country are you based in?
4. What activities did you participate in?
    a. Reviewing the existing metadata information
    b. Analyzing sectoral correlations and trends on geospatial information applications
    c. Producing guidelines on common data format
    d. Disseminating the guidelines
    e. Two regional expert meetings in Bangkok
    f. Three capacity development workshops in pilot countries (Indonesia, Thailand, and Mongolia)
5. Was your organization involved in the design of the project?
    a. Yes
    b. No
6. What was the role of your organization in the implementation of the project activities?
7. To what extent do you agree with the following?

		Strongly Agree	**Agree**	**No Opinion**	**Disagree**	**Strongly Disagree**
1	Project activities contribute to the results effectively.					
2	The project provided relevant information to stakeholders.					
3	The project was implemented with stakeholders efficiently to reach the results.					
4	Partnering with stakeholders enabled or enhanced the reaching of results					
5	Results of the project can be continued without ESCAP's further involvement					

6	Gender and human rights were integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis					

8. What do you think were the most significant results at the regional and national levels achieved or contributed by the project?

9. How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?

10. What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States?

Outcome of Project

11. Have you observed any change related to geospatial information sharing in your organization / city / country / as a result of the project?
    a. Yes
    b. No
12. If yes, what changes have you observed?

13. If no, what are the reasons that inhibits these changes?

Recommendations

14. What are your recommendations for improving the implementation of similar projects in the future?

Annex 4: List of interviewees

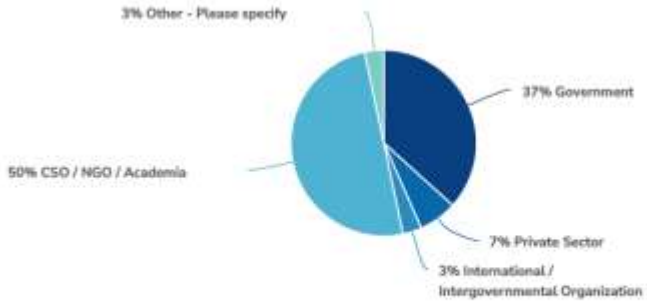
No	Organization	Contact location (City/Country)	Contact Name	Gender
1	IDD, ESCAP (Chief)	Bangkok, Thailand	Keran Wang	M
2	IDD, ESCAP	Bangkok, Thailand	Kareff May Rafisura	F
3	IDD, ESCAP	Bangkok, Thailand	Hamid Mehmood	M
4	IDD, ESCAP	Bangkok, Thailand	Chul Min Lee	M
5	IDD, ESCAP	Bangkok, Thailand	Patricia Budiyanto	F
6	Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences	China	Zhang Miao	M
7	National Geomatics Center of China- NGCC	China	Peng Shu	M
9	Human University of Science and Technology (HNUST)	China	CHEN Hao	M
10	HNUST	China	PENG Huanhua	M
11	HNUST	China	CHU Nan	M
12	HNUST	China	WU Yerong	M
13	Guangzhou Alpha	China	HUANG Runzhi	M
14	Guangzhou Alpha	China	ZHANG Xiaoyang	M
15	Key Laboratory of Land-Surface System and Human-Earth Relations, MNR, China	China	XU Jiacheng	M
16	China Architecture Design & Research Group	China	GAO Xiuxiu	F
17	Aerospace Information Research Institute, Chinese Academy of Sciences	China	TIAN Fuyou	M
18	Aerospace Information Research Institute, Chinese Academy of Sciences	China	MA Zonghan	M
19	Chinese University of Hong Kong (Professor)	Hong Kong, China	Bo Huang	M
20	Chinese University of Hong Kong (Post Doc.)	Hong Kong, China	Hantian Wu	M
21	Chinese University of Hong Kong (Ph.D. student)	Hong Kong, China	Wenyu Li	F

22	Hasanuddin University	Indonesia	Ilham Alimuddin	M
23	Hasanuddin University	Indonesia	Andang Suryana Soma	M
24	Bandung Institute of Technology	Indonesia	Anjar Dimara Sakti	M
25	National Research and Innovation Agency (BRIN)	Indonesia	Orbita Roswintiarti	F
26	BRIN	Indonesia	M. Rokhis Khomarudin	M
27	BRIN	Indonesia	Yohanes Fridolin Hestrio	M
28	Prince of Songkla University	Thailand	Kuaanan Techato	M
29	Geo-Informatics and Space Technology Development Agency	Bangkok, Thailand	Tanita Suepa	F
30	Geoinformatics Center Asian Institute of Technology	Bangkok, Thailand	Manzul Hazarika	M
31	Head of RS department, Information and Research Institute of Meteorology, Hydrology and Environment	Mongolia	Odbayar. M.	M
32	DDG-SST, Philippine Space Agency (PhilSA)	Philippine	Gay Jane Perez	F
33	DG, Arthur C Clarke Institute for Modern Technologies (ACCIMT)	Sri Lanka	Sanath Panawennage	M

※ A dyadic interview and Focus Group Discussions (FGDs)(Indonesia, China, Hong Kong, China) were arranged based on the stakeholder's situation.

Annex 5: Questionnaire's Results

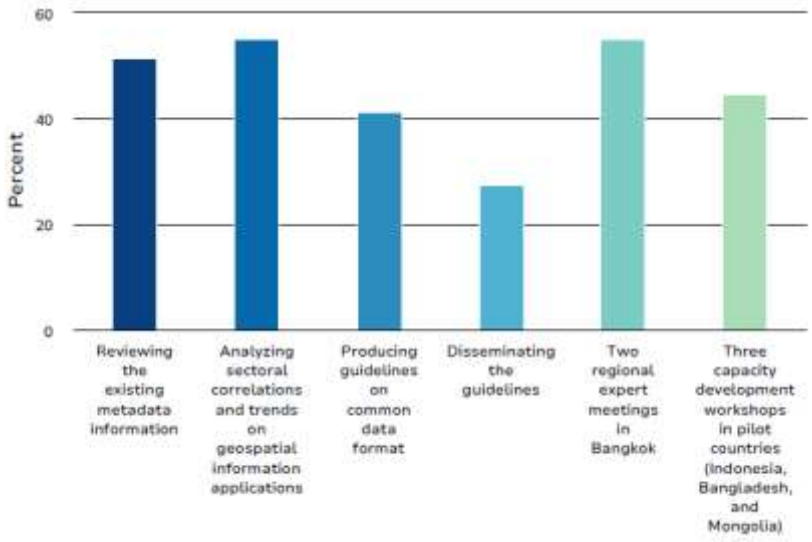
Stakeholder Type



Value	Percent	Responses
Government	36.7%	11
Private Sector	6.7%	2
International / Intergovernmental Organization	3.3%	1
CSO / NGO / Academia	50.0%	15
Other - Please specify	3.3%	1

Totals: 30

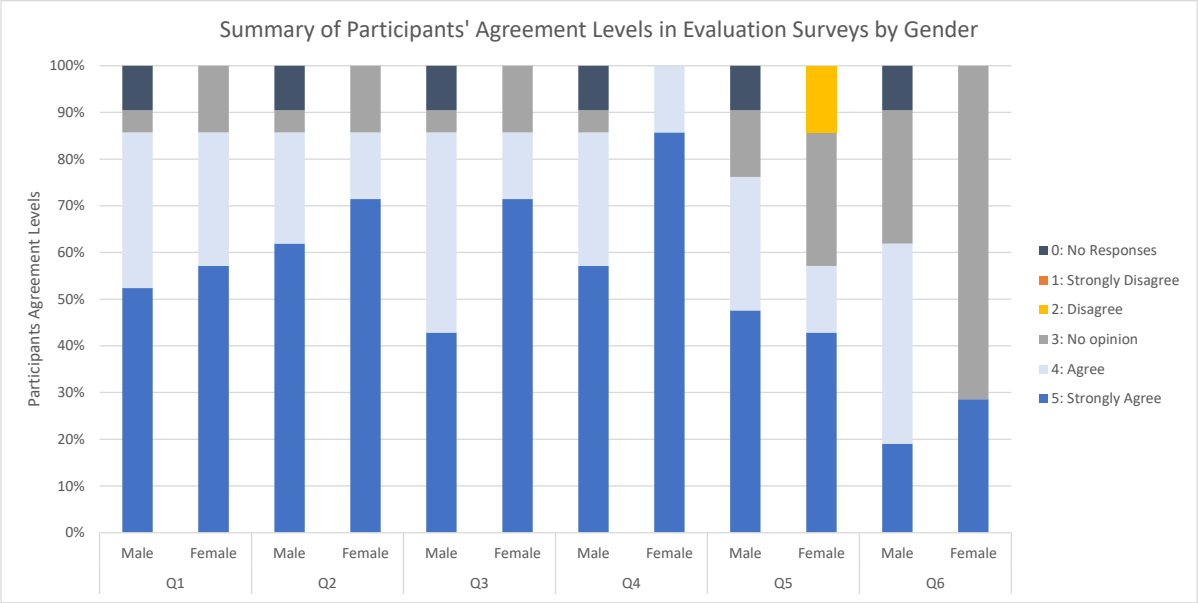
Participated Activities



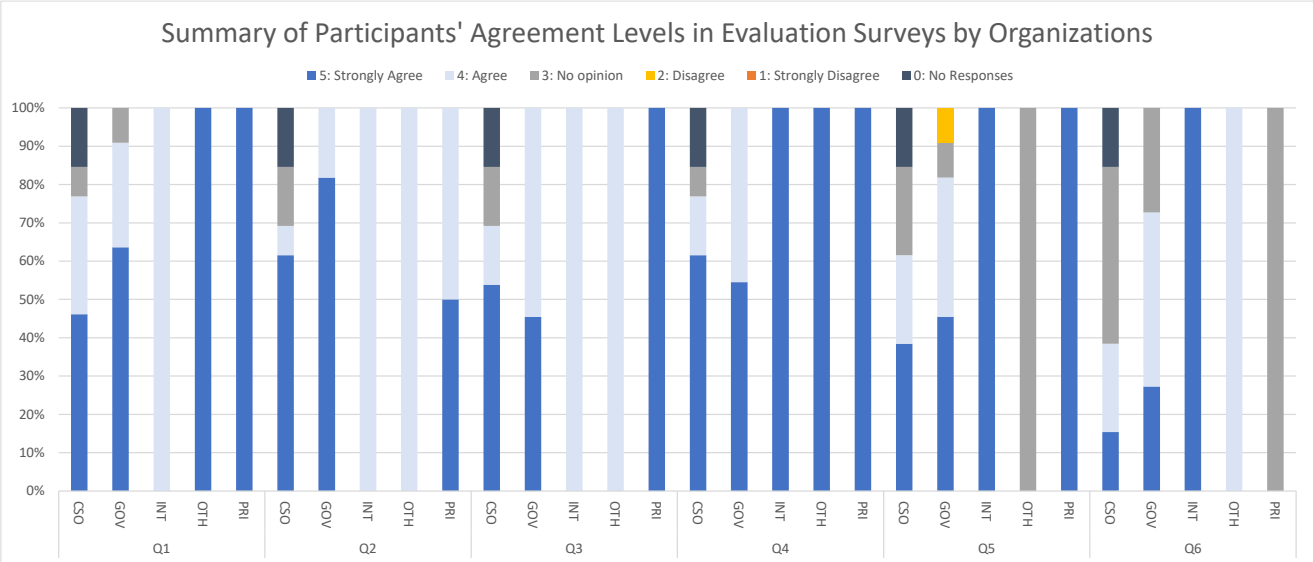
Participants' Agreement Level : Overview

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Responses
Project activities contributed to intended results effectively Count Row %	16 57.1%	10 35.7%	2 7.1%	0 0.0%	0 0.0%	28
The project provided relevant information to stakeholders Count Row %	18 64.3%	8 28.6%	2 7.1%	0 0.0%	0 0.0%	28
The project was implemented with stakeholders efficiently Count Row %	14 50.0%	12 42.9%	2 7.1%	0 0.0%	0 0.0%	28
Partnering with organizations enabled or enhanced the reaching of results Count Row %	18 64.3%	9 32.1%	1 3.6%	0 0.0%	0 0.0%	28
Results of the project can be continued without ESCAP's further involvement Count Row %	13 46.4%	9 32.1%	5 17.9%	1 3.6%	0 0.0%	28
Gender and human rights were integrated into the design and implementation of the project Count Row %	6 21.4%	9 32.1%	13 46.4%	0 0.0%	0 0.0%	28
Totals Total Responses						28

Participants' Agreement Level: Gender



Participants' Agreement Level: Organization



Q1. Project activities contributed to intended results effectively.

Q2. The project provided relevant information to stakeholders.

Q3. The project was implemented with stakeholders efficiently.

Q4. Partnering with organizations enabled or enhanced the reaching of results.

Q5. Project results can be continued without ESCAP's further involvement.

Q6. Gender and human rights were integrated into the design and implementation of the project.

Annex 6: Evaluation Ratings

Survey Questions	Indicators		Overall (1)*0.4 +((2)+(3))/2*0.6
	1)	2)+3)	
Effectiveness			
1. What were the most significant results at the regional and national levels achieved or contributed by the project? Describe the project activities/outputs that lead to the results and present evidence of the project's contribution to the results.	**4.5**	**4.8**	**4.5**
2. How did adjustments made to the project due to the COVID-19 pandemic affect the achievement of the project's results?		**4.5**	
Relevance			
3. To what extent was the project designed based on demand from the target beneficiaries?	**4.6**	**4.5**	**4 .6**
4. What adjustments, if any, were made to the project activities and modality, as a direct consequence of the COVID-19 situation, or in response to the new priorities of member States?		**4.8**	
Efficiency			
5. To what extent did the project achieve efficiency in implementation through the combination of project stakeholders involved, making use of comparative advantages, and the creation of synergy?	**4.5**	**4.8**	**4.6**
o6. To what extent has partnered with other organizations enabled or enhanced the reaching of results?		**4.5**	
Sustainability			
7. To what extent can the project results be continued without ESCAP's further involvement?	**4.2**	**4.0**	**4.1**
Gender and human rights mainstreaming			
8. To what extent were gender and human rights integrated into the design and implementation of the project, informed by relevant and tailored human rights and gender analysis?	**3.7**	**4.5**	**4.2**

(1) Questionnaire rating question's results (percent average); (2) Desk Review; (3) Interviews and Questionnaire survey (free answers)
(2) 0 < very low =< 2.0 < low =< 3.0 < medium =< 4.0 < high =< 4.5 < very high =< 5.0

Annex 7: List of documents reviewed

1	Project Annual Progress Report-February 21 and March 10, 2020
2	Project Document- December 28, 2018
3	Project Terminal Report-December 8, 2022
4	Analytical document on sectoral correlations and trends on geospatial information applications (1) (unescap.org))
5	Analytical document on sectoral correlations and trends on geospatial information applications". (Review of Metadata Version 2.0_rev (unescap.org)
6	Integrating space applications and socioeconomic data (https://www.unescap.org/kp/2020/preliminary-analysis-covid-19-response-and-recovery-policies- asia-and-pacific-integrating)
7	Guideline on Common Data Format for Local SDGs Assessment and Monitoring (https://www.unescap.org/events/2022/improving-use-and-sharing-geospatial-information- resilient-and-sustainable-development)
8	GISTDA guideline (https://www.unescap.org/events/2022/improving-use- and-sharing-geospatial-information-resilient-and-sustainable-development)
9	Integration of geospatial information for sustainable urban development" (https://www.unescap.org/sites/default/d8files/event-documents/PDF_CONCEPT%20NOTE_PSU-UGS%20Training_01DEM2020.docx_.pdf).
10	ESCAP workshop (https://www.unescap.org/events/2021/training-workshop-geospatial-information-platform-covid-19- situation-analysis-and-0).
11	Hands-on Training on Geospatial Good Practices Database and Dashboard was organized virtually in July 2021 (https://www.unescap.org/events/2021/hands-training-geospatial-good- practices-database-and-dashboard)
12	Online dashboard (Geospatial good practices dashboard) https://www.unescap.org/sites/default/d8files/event-documents/PPT_Good%20Practices%20Database%20Introduction%20June%2021.pdf
13	2022 Compendium on geospatial practices for sustainable development in South-East Asia.
14	ASEAN Science & Technology Network (ASTNET) (2021). Sub-committee on space technology and applications. Available at https://astnet.asean.org/sub-committee-on-space-technology-and-applicationsscosa/
15	Asian Development Bank (2021). Mapping the spatial distribution of poverty using satellite imagery in Thailand. April. Available at https://www.adb.org/publications/mapping-poverty-satellite-imagery-thailand
16	Philippine Space Agency (PhilSA) (2021). Philippine National Statement on Agenda Item 1(e) on the Progress in Implementing the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030). 25th session of the Intergovernmental Consultative Committee (ICC-25) on the Regional Space Applications Programme for Sustainable Development (RESAP). 24 August. Bangkok. Thailand. Available at https://www.unescap.org/sites/default/d8files/event-documents/3.%20Philippines_PhilSA_Gay%20Jane%20P.%20Perez_Statement%20and%20Presentation.pdf
17	Schwab, Klaus (2016). The Fourth Industrial Revolution: what it means, how to respond. World Economic Forum. Available at https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-itmeans-and-how-to-respond/
18	Roswintiarti, Orbita (2022). Development of an open access-based operational platform to map slums in supporting the distribution of government social assistance program for potential recipients in Bandung, West Java Province, Indonesia and Makassar, South Sulawesi Province, Indonesia. Expert Advisory Meeting on Building Institutional Capacity for the Use of Integrated Spatio-Temporal Data in Local SDGs monitoring and decision-making, PowerPoint presentation, 5-7 July 2022. Available at https://unescap.org/ sites/default/d8files/event documents/SECRETARIAT%20NOTE%20ON%20SPACE%2B%20_0.pdf
19	Nakasu, Tadashi (2022). Evaluation of the Implementation of the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030) in its Phase I (2018-2022).

20	Secretariat of Indonesian Space Agency, National Research and Innovation Agency of the Republic of Indonesia (2022). Agenda item 2: Progress in Implementing the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018-2030), 26th session of the Intergovernmental Consultative Committee (ICC-25) on the Regional Space Applications Programme for Sustainable Development (RESAP). 18 August. Jakarta. Indonesia. Available at https://www.unescap.org/sites/default/d8files/eventdocuments/Indonesia%20.pdf
21	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2022a). Asia and the Pacific SDG Progress Report 2022: Widening disparities amid COVID-19. United Nations publication.
22	Ahmad, S. S. Farhana, and N. Hazrina Idris (2021). Oil Spill Impacts on Mangrove Forest from Satellite Remote Sensing. 2021 7th International Conference on Space Science and Communication (IconSpace),23-24 November, pp. 60-64. Available at doi: 10.1109/IconSpace53224.2021.9768774
23	Badan Informasi Geospasial (2022). Monitor COVID-19 Distribution Through Maps. 21 September. Available at https://www.big.go.id/en/news/2020/03/23/monitor-covid-19-distribution-through-maps
24	Geoportal Philippines (2022). COVID-19 Map. Available at https://geoportal.gov.ph/gpapps/covidapp
25	GISTDA and others (n.d.). Space-Based PM2.5 Monitoring System. Available at http://pm25.gistda.or.th/pm25/
26	National Institute of Environmental Research and United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (n.d.). Concept Note on Building the Pan-Asia Partnership for Geospatial Air Pollution Information, Available at https://philsa.gov.ph/wp-content/uploads/2022/06/1-Concept-Note_Building-the-Pan-Asia-Partnership-for-Geospatial-Air-Pollution-Information_20200622-1.pdf
27	PRiSM. Available at https://prism.wfp.or.id/app/?hazardLayerId=rainfall_dekad&date=2022-03-11
28	Rapid Prototype Development (RPD) Challenge (2021). Available at https://www.rpdchallenge.com/
29	The AHA Centre (2022). ASEAN Risk Monitor and Disaster Management Review (ARMOR). 3rd Edition.
30	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (n.d.). Asia Pacific Risk and Resilience Portal. Available at https://rrp.unescap.org
31	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2021a). Big data for populations and social statistics. Stats Brief, No. 29. April. Available at https://www.unescap.org/sites/default/d8files/knowledge-products/Stats_Brief_Issue29_Big_data_for_population_and_social_statistics_Apr2021.pdf
32	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2021b). Big Data for the SDGs: country examples in compiling SDG indicators using non‐traditional data sources. Working Paper Series SD/WP/12. January. Available at https://unescap.org/sites/ default/d8files/knowledgeproducts/SD_Working_Paper_no12_Jan2021_Big_data_for_SDG_indicators.pdf
33	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2022a). Asia-Pacific Digital Transformation Report 2022: Shaping Our Digital Future. United Nations publication.
34	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2022a). Asia-Pacific Digital Transformation Report 2022: Shaping Our Digital Future. United Nations publication. (2022b). Inequality of Opportunity in Asia and the Pacific: Financial Inclusion 2022 Update. Social Development Policy Papers No. 2021-06. United Nations publication.
35	United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2022a). Asia-Pacific Digital Transformation Report 2022: Shaping Our Digital Future. United Nations publication. (2022c). Pathways to Adaptation and Resilience in South-East Asia: Subregional Report.Bangkok. Available at https://www.unescap.org/kp/2022/asia-pacific-disaster-report-2022-escapsubregions-pathways-adaptation-and-resilience-0?fbclid=IwAR0REvmCOw-vyGj0pkk-Q0dWJV309Pd4tEaPV5pDnUYGg1zobxb17MVp0I
36	United Nations, Department of Economic and Social Affairs (n.d.). SDGs Local Monitoring – China's Pilot Practice. Available at https://sdgs.un.org/partnerships/sdgs-local-monitoring-chinas-pilot-practice
37	United Nations Economic and Social Commission for Asia and the Pacific. (n.d.). 22nd ICC, Regional Space Applications Programme for Sustainable Development (RESAP). Retrieved from https://www.unescap.org/our-work/sustainable-urban-development/regional-space-applications-programme-sustainable