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A Needs Assessment of Geospatial Data and Technologies in the Lower Mekong Region

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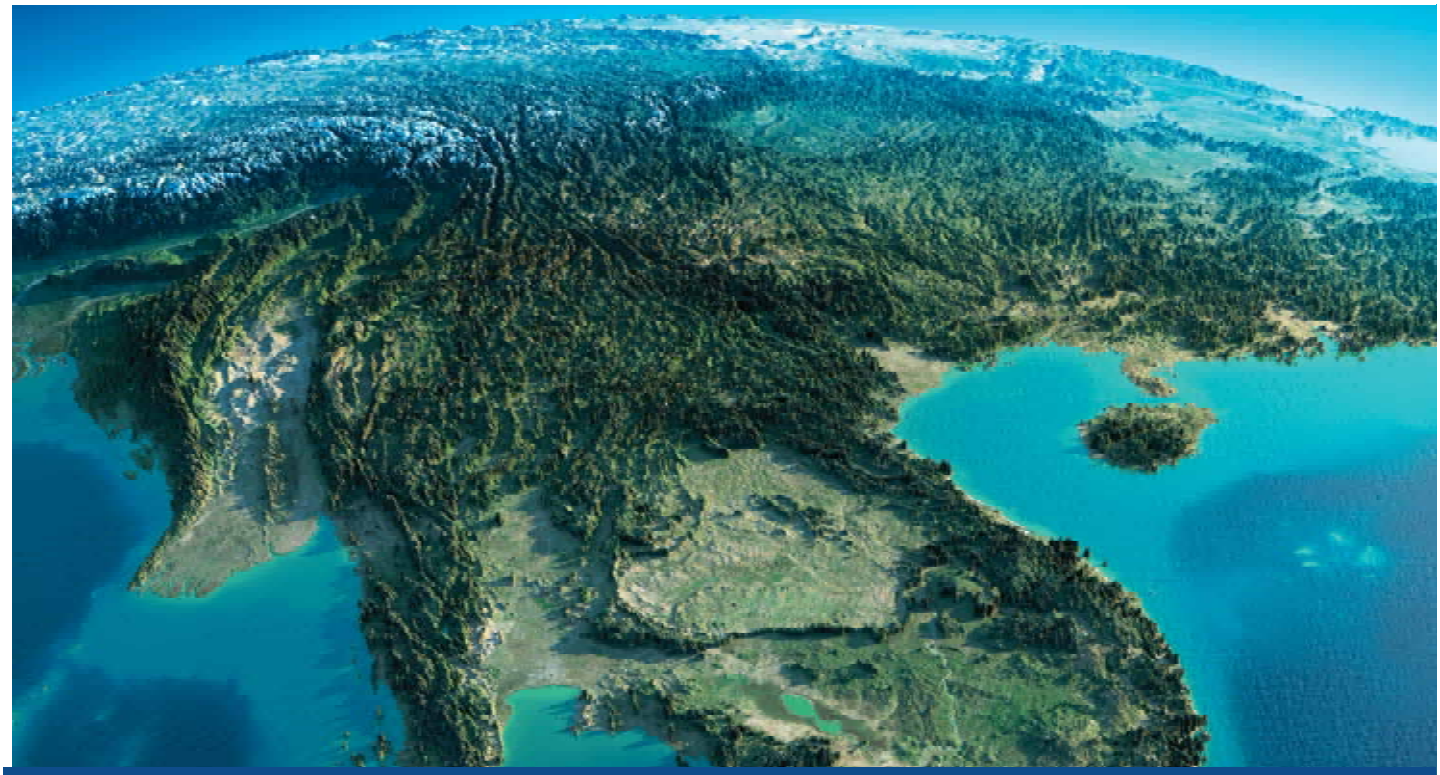
Deltares Enabling Delta Life



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DISCLAIMER

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Executive Summary

Rapid economic and population growth in the Lower Mekong Region (LMR) – comprising Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand, and Vietnam – continue to drive changes in the region's water regimes as well as the loss and degradation of natural vegetation and soils. These changes, in turn, are having an impact, often negatively, on ecosystem services, food and water security, and biodiversity. All of these impacts are exacerbated by climate change, further highlighting the need for improved governance and decision-making in virtually all sectors.

Geospatial data and technology can contribute significantly to more timely and informed decision-making. For example, satellite radar-estimated rainfall can extend the early warning period for serious floods. However, in order to be useful in a planning, policy or other decision-making context, information must reach the right people and institutions at the right time and in the right form.

SERVIR-Mekong, the latest addition to a USAID and NASA-initiated global network of hubs supporting the application of geospatial data and technologies for decision-making, carried out a needs assessment in late 2014 and early 2015 to explain the program's strategic focus as well as provide a resource for other stakeholders seeking to improve the effective application of geospatial data and technologies in the Lower Mekong Region (LMR). This report is the result of that assessment.

Data for the assessment were compiled using three methods: stakeholder consultations; an online questionnaire; and a desk review of relevant literature. A full range of country and regional stakeholders were targeted at the regional and country levels, including government agencies, academic and research institutions, non-governmental organizations (NGOs) and other civil society organizations, multi- and bilateral aid agencies, United Nations agencies and similar extra-national governance and support institutions, private sector entities and individual citizens.

The specific objectives of the assessment were to identify geospatial data and technology needs in the following thematic areas:

- **Key themes** about which geospatial information is considered important for decision-making (e.g., land governance and management, water governance and management, climate change adaptation, disaster risk assessment etc.);
- **Geospatial data** (e.g., Landsat remote sensing products, land cover maps, flood forecast maps etc.);
- **Data sharing** (e.g., the sharing of data from public agencies with the public, sharing of data between agencies, standards for metadata and data quality to facilitate sharing etc.);
- **Capacity-building** (e.g., basic GIS skills, managing complex server structures etc.); and
- **Tools and applications** (e.g., decision-support tools, online information portals, custom desktop applications etc.).

Secondary objectives included identifying: (a) the most promising frameworks and specific strategies for addressing the needs identified; and (b) the challenges and solutions related to gender in the development and application of geospatial data and technologies.

Priority **thematic areas** where stakeholders reported geospatial data and technologies that are playing (or potentially play) a key role include: (a) land use and land cover mapping and monitoring (especially forests and agriculture); (b) disaster risk management (especially early warning systems for droughts and flooding); (c) water resource planning, management and monitoring; (d) agricultural monitoring and food security; and (e) climate change adaptation and mitigation.

Priority **data and metadata needs** indicated by stakeholders include: (a) compiling inventories of existing geospatial data products, including metadata related to existing datasets; and (b) facilitating improved policies and practices related to accuracy assessments of geospatial data products. At a more specific level, needed geospatial datasets include land use and land cover patterns and trends, basic infrastructure (especially in Myanmar and the Lao PDR), hydro-meteorological data and forecasts (especially related to rainfall), hazard risk maps, and distribution of natural capital and ecosystem services.

Areas where **data-sharing and/or standards** need the most improvement include generally improving sharing between government agencies as well as between government and non-governmental organizations. Generally increasing the availability of geospatial data via the adoption of open data policies was also identified as a top priority.

Specific challenges cited by stakeholders include: (a) limited opportunities for data users to provide specific feedback to producers (resulting in important issues not being addressed and potentially propagating in multiple data products): and (b) limited use of data shared with government agencies by non-government entities due to a perceived lack of credibility in data collection or processing methods. Improvements in meta-data standards and stewardship are seen as being valuable steps in rectifying these and other issues.

Capacity-building priorities identified by stakeholders include: (a) improving basic map, model, and other data interpretation skills within government agencies (especially at sub-provincial levels): and (b) the need for appropriate hardware and budgets to carry out needed geospatial functions. Stakeholders suggested that increased emphasis on "on-the-job" training, increasing structured training at universities in the region, improving the retention rate of technical practitioners in public institutions, and improving the availability of local language training materials would all be important for boosting geospatial skills and capacity.

Finally, stakeholder-identified priorities for developing **custom tools and applications** included: (a) mapping and monitoring land use and land cover (especially natural forests, plantation forests, and crops); (b) monitoring and forecasting floods and droughts; (c) measuring ecosystem services; (d) forecasting crop yields; and (e) facilitating basin-wide planning.

Recommendations

Based on the above results and suggestions from stakeholders, the following are recommendations for institutions and projects working to improve the application of geospatial data and technologies for decision-making in the LMR:

1. *Promote and support the development of a community of practice around the use of geospatial data for decision-making.*
2. *Create web-based resources and support events that bring practitioners together to share experiences and information, coordinate and collaborate on strategies and tools, as well as to build capacity for effectively and efficiently addressing priority needs.*
3. *Work with decision makers, technical staff, and other stakeholders to develop customized, context-specific decision-support tools that will be used to enhance priority management, planning, and policy development processes.*
4. *Promote the integration of geospatial considerations across sectors to address issues of contradictory plans, policies and decisions.*
5. *Develop a guidance note on for GIS developers and application users on how to integrate gender concerns, and point to types and sources of gender-related data that can be used in various GIS tools.*

6. *Support existing initiatives to clarify, inventory, and harmonize geospatial data resources in all LMR countries, especially in Cambodia, the Lao PDR and Myanmar.*
7. *Support the further development of a regional network of universities conducting geospatial-related research and capacity-building, and support their efforts to more effectively understand and link their work with government agencies.*
8. *Create and enhance online portals and other data-sharing mechanisms that make it easier for practitioners to access and use satellite-derived data for monitoring and forecasting.*
9. *Promote international metadata standards and tools that facilitate the efficient authoring and stewardship of metadata.*
10. *Document the value of open data policies, and showcase examples of how such policies can enhance outcomes and save resources in the region.*
11. *Work with stakeholders to design, build and maintain decision-support tools related to the region's top geospatial application priorities. These include, in order of priority expressed by contributors to this assessment:*
    - *Land cover land use monitoring;*
    - *Flood and drought forecasting and risk mapping;*
    - *Multi-hazard risk assessment;*
    - *Water resource monitoring and management;*
    - *Crop monitoring and food security;*
    - *Weather monitoring and forecasting;*
    - *Ecosystem and ecosystem services assessment and monitoring;*
    - *Environmental impact assessment;*
    - *Disaster risk management related to extreme weather events, forest fires and landslides;*
    - *Sea level rise and coastal resource management;*
    - *Air, soil, and water contaminant monitoring; and*
    - *Solids/sediment transport in rivers.*
12. *Using similar methods as those used in this assessment, reassess regional geospatial data and technology needs at two- or three-year intervals so that changing priorities can be identified, and effectively and efficiently addressed.*