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LISA PLATFORM USER MANUAL (D4.1)

CLIMATE RISK ASSESSMENT FOR SUBNATIONAL ADAPTATION AND ESTABLISHMENT OF A LOCAL CLIMATE INFORMATION SYSTEM FOR CLIMATE CHANGE ADAPTATION (LISA)

June 2023

Prepared for: **UN-CTCN and MoE**
Prepared by: **ICEM**

icem

DISCLAIMER

This document was prepared for the United Nations Climate Technology Centre and Network (UN-CTCN) by an ICEM consultant team engaged to undertake the *Technical Assistance – Climate risk assessment for subnational adaptation and establishment of a local climate information system for climate change adaptation (LISA) in Cambodia.* The views, conclusions and recommendations in the document are not to be taken to represent the views of the UN-CTCN.

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ABBREVIATIONS

ICEM	International Centre for Environmental Management
LISA	Local Climate Information System for Climate Change Adaptation
CIS	Climate information system
MoE	Ministry of Environment
TA	Technical Assistance
UN-CTCN	United Nations Climate Technology Centre and Network

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1 INTRODUCTION

This manual is deliverable Output 4.1 (*Report on the design of contents and specifications for LISA, with the initial mock-up of the system (website) and testing result*) of the *Technical Assistance on Climate risk assessment for subnational adaptation and establishment of a local climate information system for climate change adaptation (LISA) in Cambodia*.

The TA is funded by the United Nations Climate Technology Centre and Network (UN-CTCN) and aims to design a web-based local climate information system (CIS), which can support adaptation decision making processes and provide services for climate information delivery at the subnational (local) level. The TA will be achieved through the following key activities:

- Identification of the current status of the CISs in Cambodia;
- Identification of stakeholder's needs and climate change risk assessment at the selected municipality; and
- Development of LISA at the selected municipality.

The purpose of this manual is to provide guidance on how to use the LISA platform, including how to use it for performing climate change impact and vulnerability assessment. The manual describes the content and functions of each of the LISA platform pages, using a series of screenshots. This report, together with the LISA application software and data will be additionally packaged and shared (Output 4.8).

2 LISA PLATFORM USER MANUAL

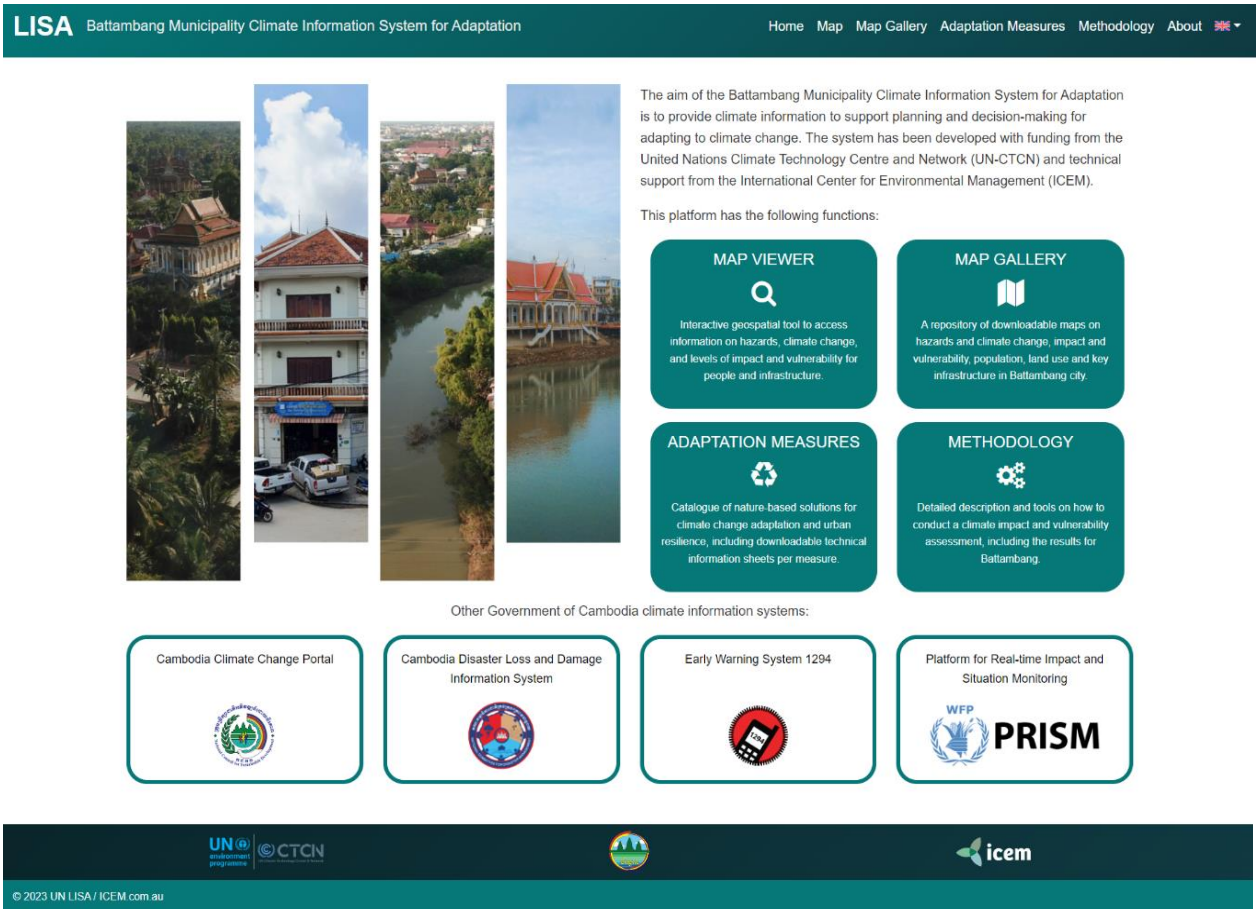
The manual describes the content and functions of each page on the LISA platform. Potential users should read the manual along the LISA platform itself. The platform can be accessed at: https://icem.com.au/lisa.

2.1 Home page

The home page of the LISA platform contains the following features (Figure 1):

- A *navigation pane* at the top, providing clickable access to the subpages: i) map; ii) map gallery; iii) adaptation measures, 'methodology' and 'about'. The navigation pane also contains a 'flag' drop down menu to access the Khmer or English versions of the platform;
- The *main middle section* introducing the aim of the platform, the funding source and a reference to the technical support provided by ICEM. The introduction is followed by a description (in four clickable dark green boxes) of the key functions of the platform: i) map viewer; ii) map gallery; iii) adaptation measures; and iv) methodology;
- The *lower middle section* with four clickable boxes referencing other Government of Cambodia climate information systems: i) MOE Cambodia Climate Change Portal (https://ncsd.moe.gov.kh/dcc/data-portal); ii) Cambodia Disaster Loss and Damage Information System (http://camdi.ncdm.gov.kh/); Early Warning System 1294 (https://ews1294.com/); and the World Food Program Supported Platform for Real-time Impact and Situation Monitoring;
- A banner at the bottom of the page containing the (clickable) logos of the UN-CTCN (donor), MOE (Government project partner) and ICEM (technical support).

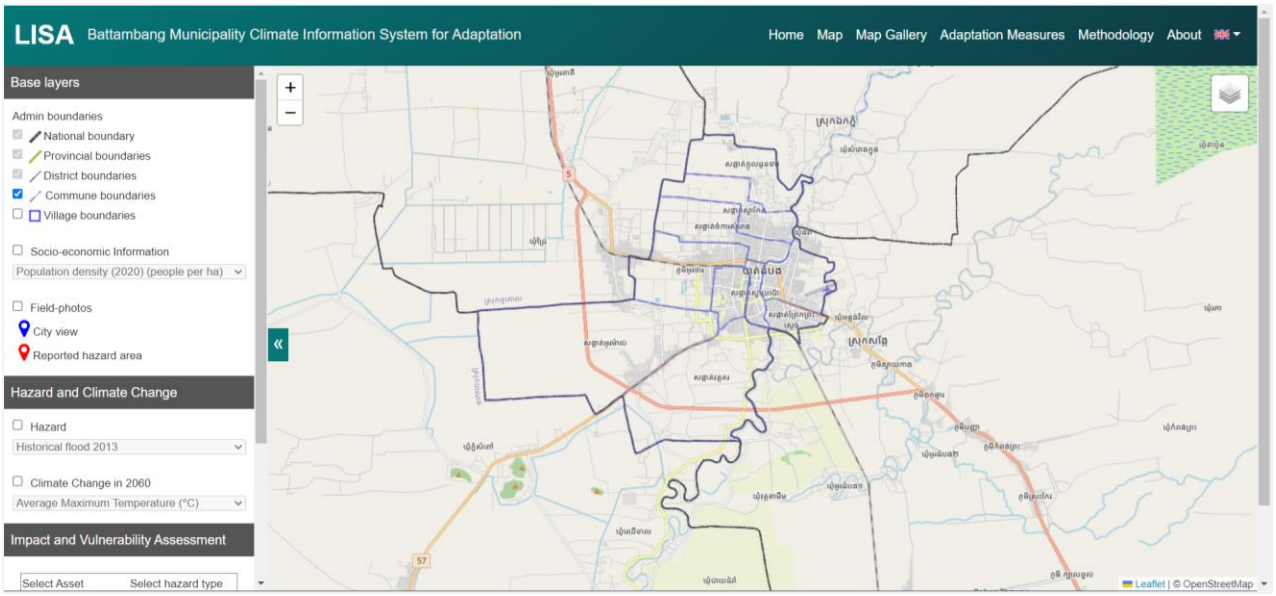
Figure 1: Home page of the LISA platform



2.2 Map viewer

The aim of the map viewer (Figure 2), the key feature of the LISA platform, is to provide access to climate information to support adaptation planning. More specifically, the map viewer supports the user to perform a climate impact and vulnerability assessment, for various hazard and climate change threats and selected urban systems such as villages, land uses, transport assets and education and health facilities.

Figure 2: The LISA map viewer landing page



The key components and data of the map viewer are:

- *Map background* (top right in the map viewer, Figure 3 and Figure 4): elevation, satellite, etc. – with the OpenStreetMap layer as the standard layer when opening the map viewer;
- *Base layers* (menu on the left): with data on admin boundaries, socio-economic information and photos;
- *Hazard and climate change* information (menu on the left): with data on hazards (flood, riverbank erosion and drought) and climate change (precipitation and temperature baseline, projections for 2060, and change); and
- *Impact and vulnerability assessment* (menu on the left): with the results of the climate risk assessment done as part of the LISA project.

The map can be zoomed in and out, and the menu on the left can be moved to the left, so the map viewer enlarges to the full screen.

Figure 3: Options for map background layers available in the LISA platform

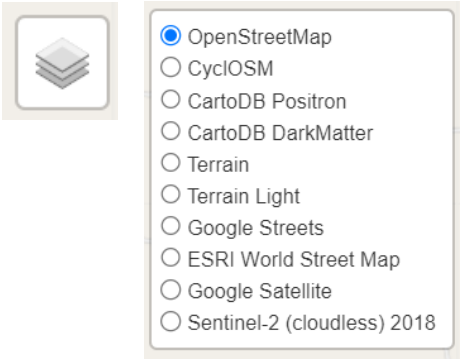
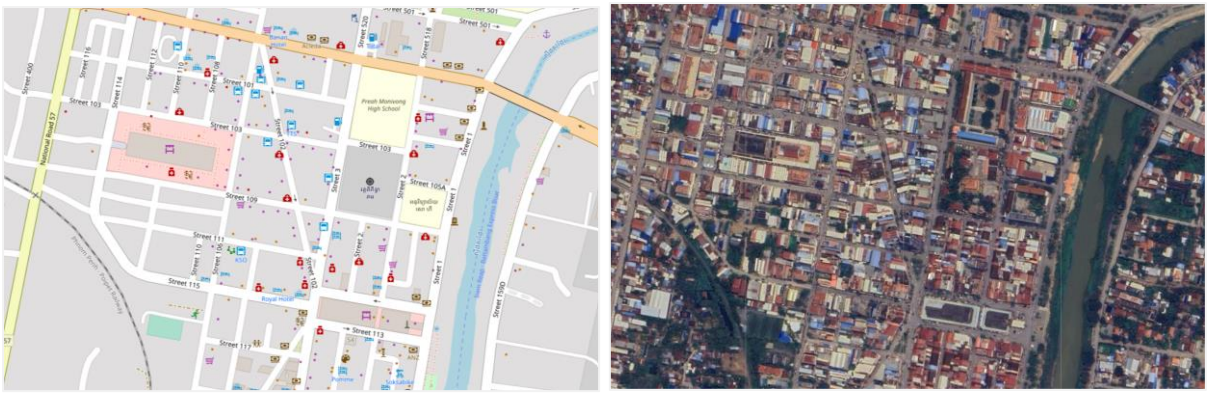


Figure 4: Example of different map layers for the city center of Battambang municipality: OpenStreetMap (left) and Google Satellite (right)



2.2.1 Base layers

The base layers menu contains information as shown in Figure 5. It helps the user with the scoping for an impact and vulnerability assessment, responding to the following questions: *what urban systems or assets will be assessed for impact and vulnerability and what do we currently know about these assets?* Once a data layer is selected from the menu, the data is presented in the map viewer and the legend of the data layers appears under the data layer name (Figure 6 and Figure 7).

Figure 5: Base layer information available in the LISA platform

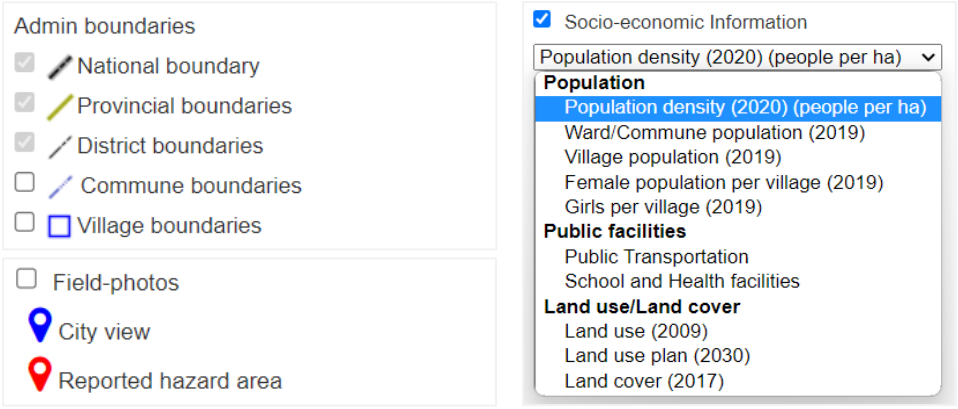


Figure 6: Example of the map viewer when selecting base layers on socio-economic information: land cover

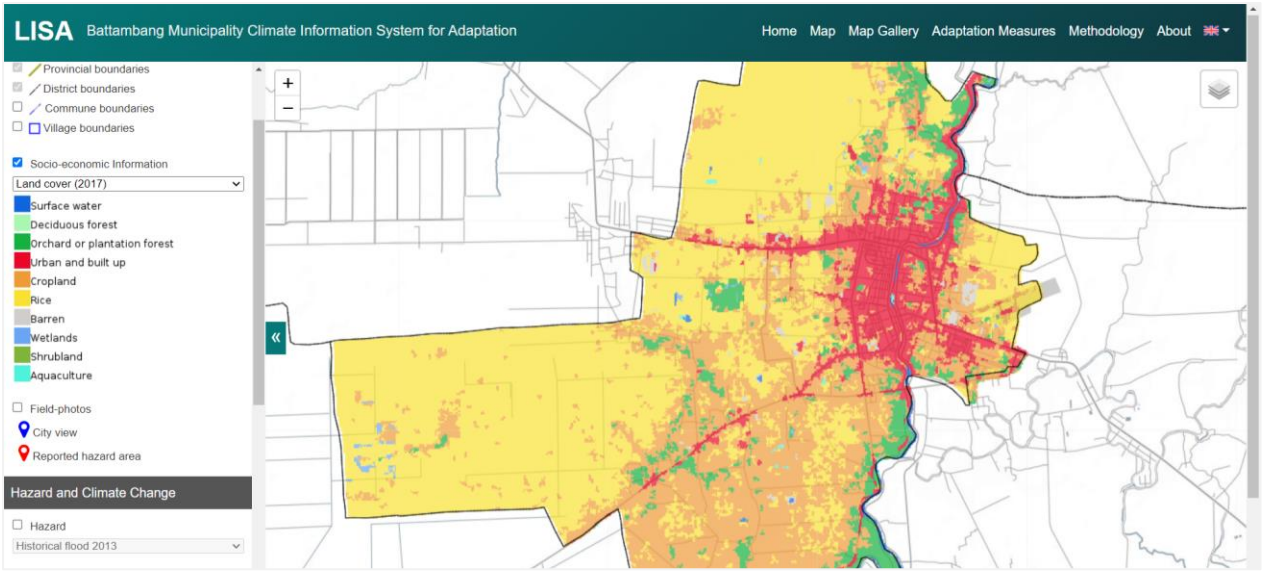
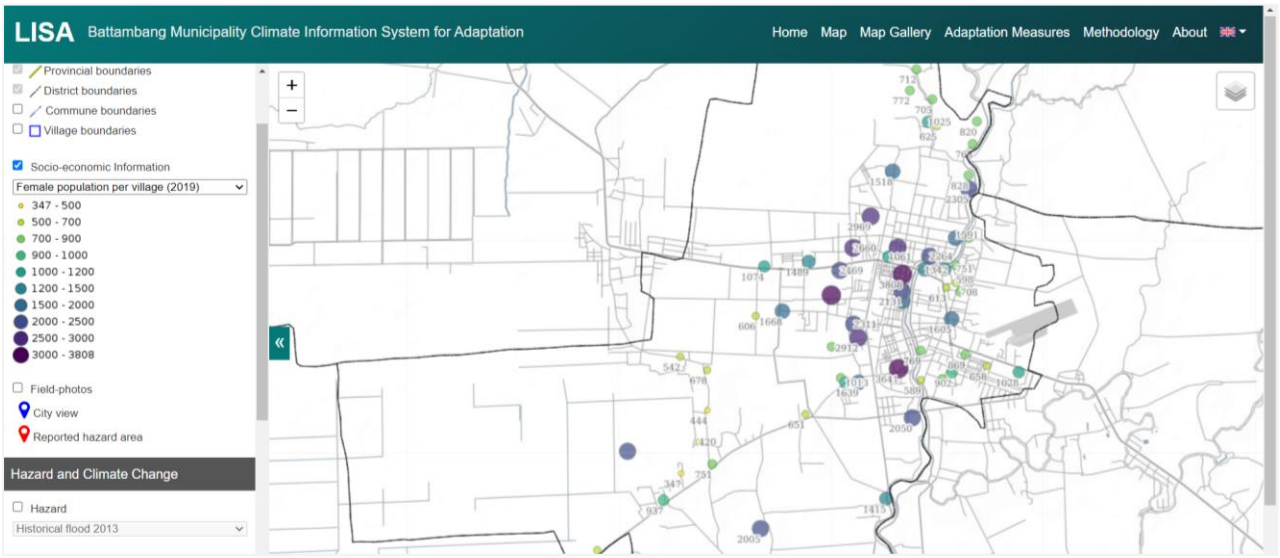
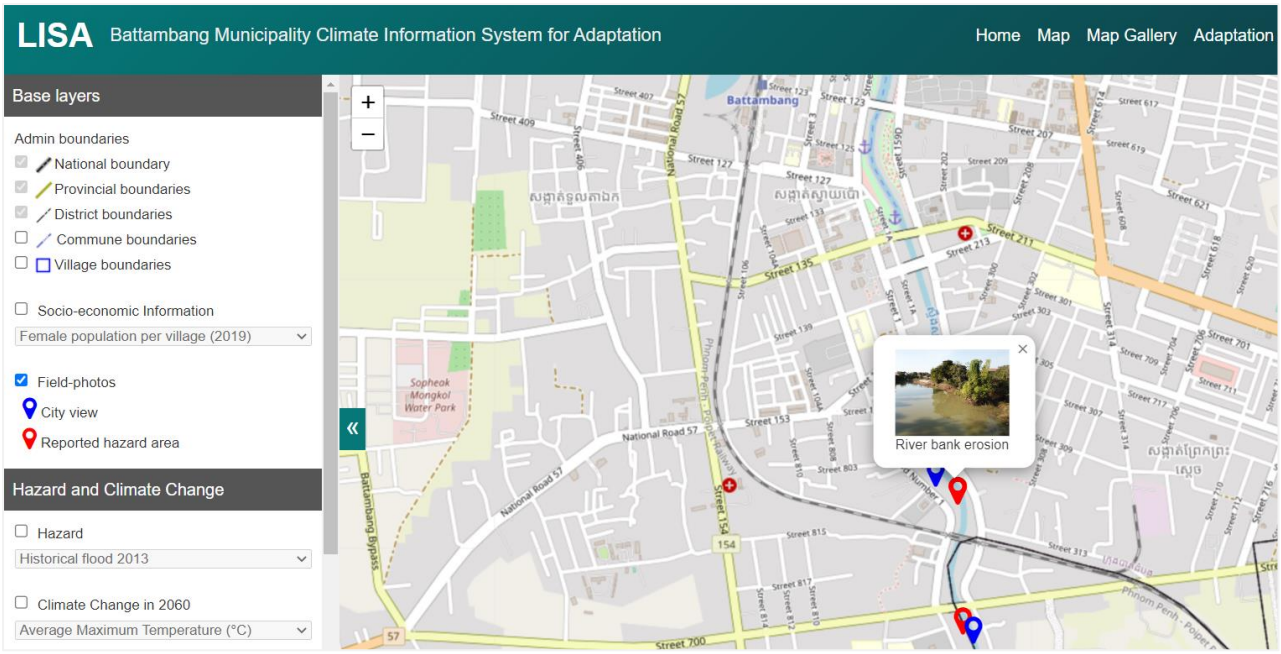


Figure 7: Example of the map viewer when selecting base layers on socio-economic information: female population per village



The base layers menu also has a 'field photos' layer, which includes geolocated pictures for two types of pictures: overall 'city view' pictures showing the general situation in the municipality, and pictures of 'reported hazard areas' or disaster impacts (Figure 8). This supports a better imagination or visualization of the scoped urban systems or assets.

Figure 8: Example of the map viewer when selecting a field picture of a report river bank erosion area

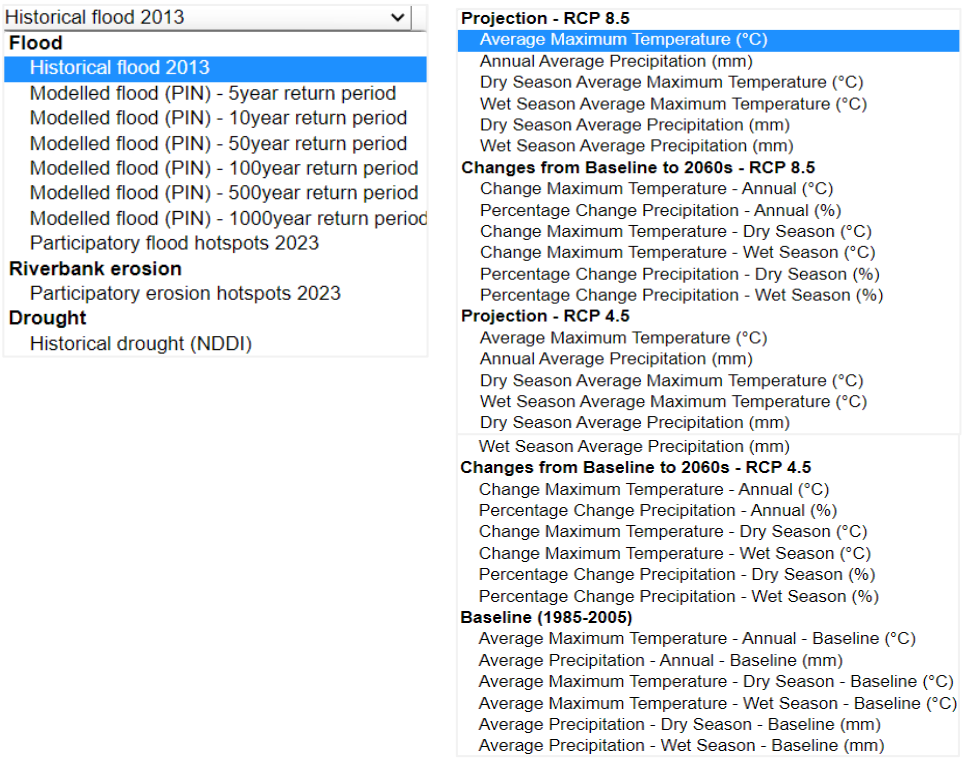


2.2.2 *Hazard and climate change information*

The map viewer also contains a series of data layers on historical and modelled hazards (flood, riverbank erosion and drought) and climate change baseline and projections for 2060, for precipitation and temperature (Figure 9). Viewing and analysing this information allows the user to conduct a baseline assessment of hazards and climate change, answering the following questions: *what hazards occur in the city and where did or can they happen? What do the climate change projections for 2060 indicate, in terms*

of trends in rainfall and temperature? How might this impact on the different hazard patterns currently happening in the city?

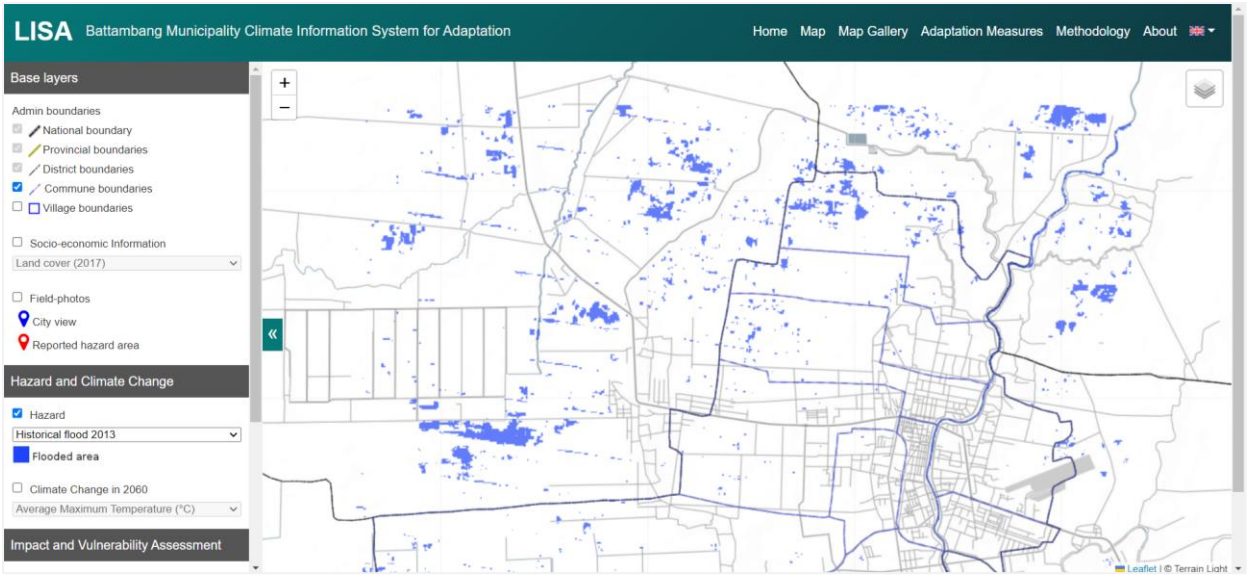
Figure 9: Hazard and climate change layer information available in the LISA platform



After clicking on the respective hazard or climate change layer in the menu on the left, the map viewer will show the data (Figure 10 to Figure 13). Different map background layers as well as base layers can be selected to overlay onto the hazard and climate change maps (see for example Figure 12).

While the climate change projections for the different representative concentration pathways (RCPs)[1] are limited in terms of downscaling to the city level, they are still useful to compare and analyze for projected trends in precipitation and temperature seasonally and over time against the baseline.

Figure 10: Example of the map viewer when selecting hazard layers: historical flood in 2013



[1] For more information, see: https://en.wikipedia.org/wiki/Representative_Concentration_Pathway

Figure 11: Example of the map viewer when selecting hazard layers: modelled flood, 100-year return period

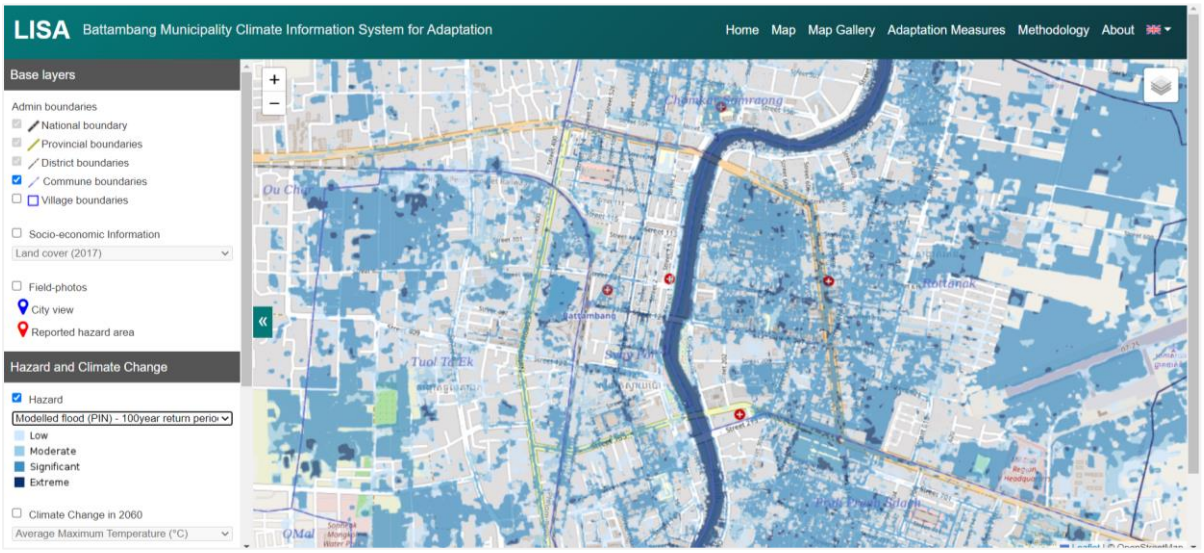


Figure 12: Example of the map viewer when selecting hazard layers: participatory map riverbank erosion

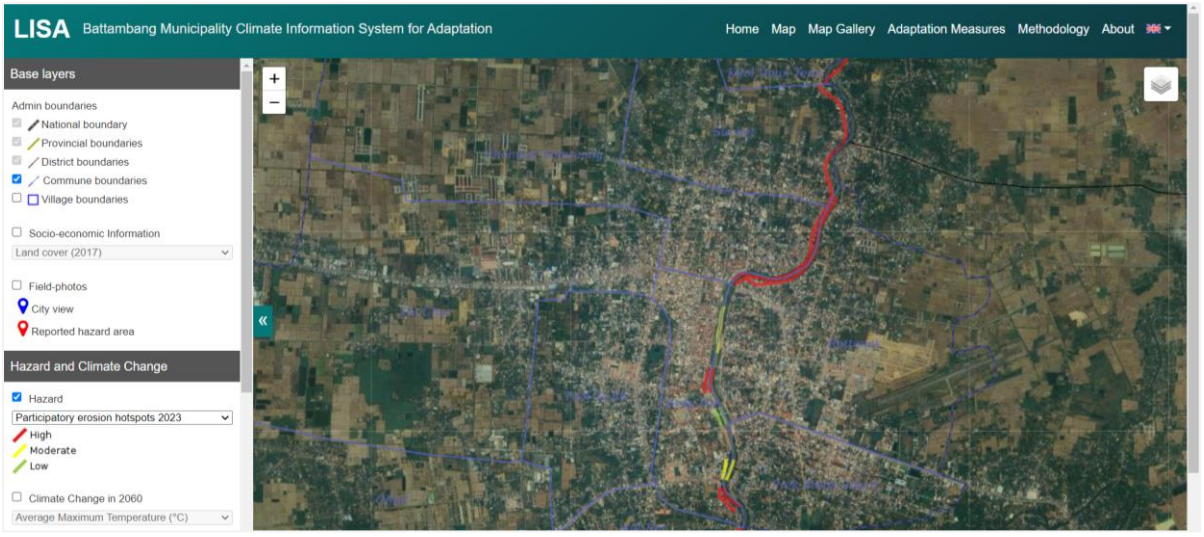
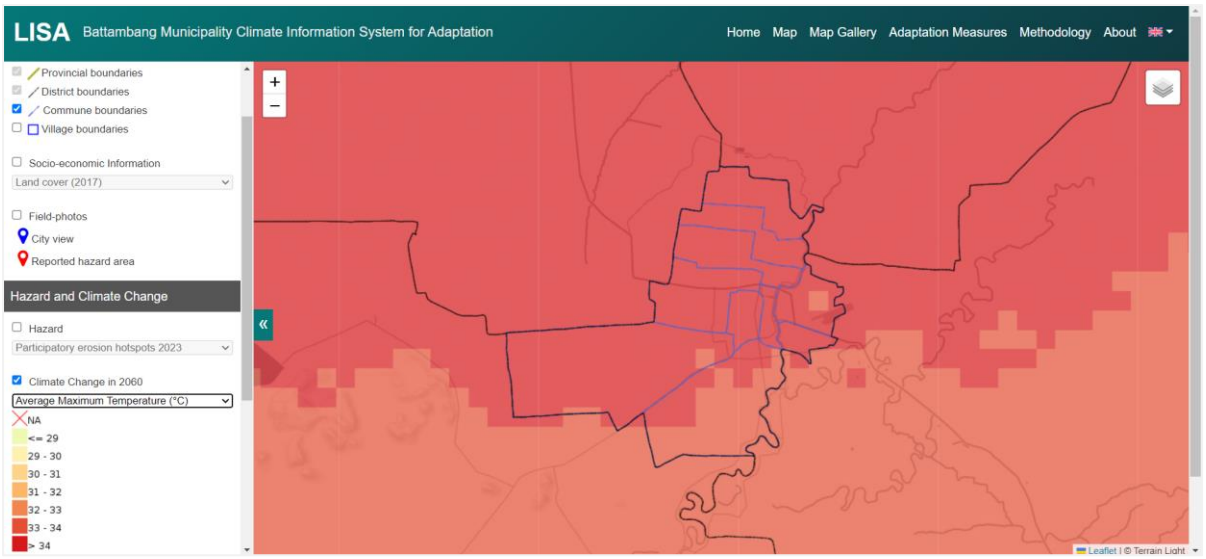


Figure 13: Example of the map viewer when selecting climate change layers: projected maximum temperature



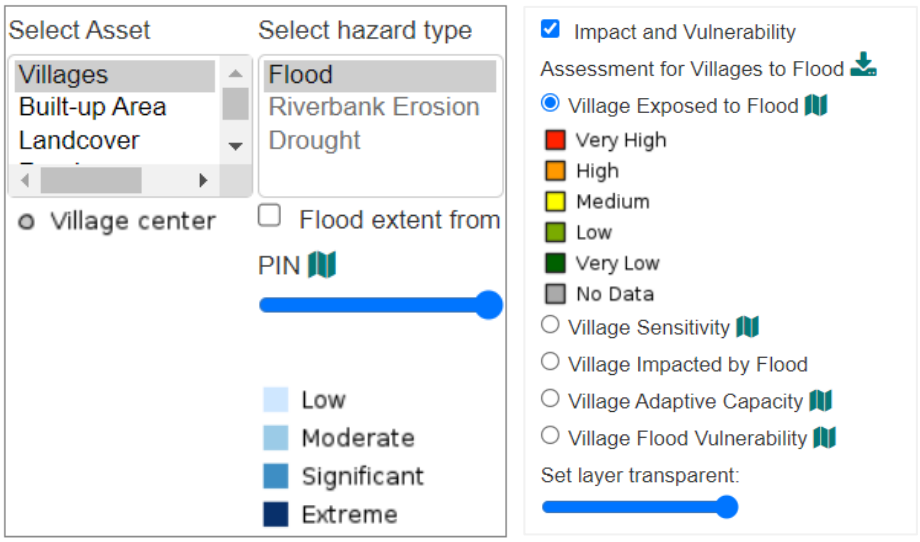
2.2.3 Impact and vulnerability assessment results

The results of the Battambang impact and vulnerability assessment have also been integrated into the map viewer. The results can be shown on the map by applying the following steps in the 'impact and vulnerability' section in the left side panel (Figure 14):

1. Select asset: villages, built-up area, landcover, roads, railways, and schools & health facilities;
2. Select hazard type: flood, riverbank erosion and drought
3. Select impact and vulnerability assessment layers: exposure, sensitivity, impact, adaptive capacity and vulnerability

After selecting the respective hazard and impact and vulnerability assessment layers, the legend for each of these layers appears underneath.

Figure 14: Interface for accessing the impact and vulnerability assessment information in the map viewer



For each of the assets and hazards, the following climate change impact and vulnerability assessment information is available (Table 1 and Figure 15 to Figure 17):

Table 1: Impact and vulnerability assessment layers available in the LISA platform

Select asset	Select hazard	Select impact and vulnerability assessment
Villages	Flood	Exposure, sensitivity, impact, adaptive capacity and vulnerability
Built-up area	Flood	Exposure
Landcover	Drought	Exposure, sensitivity and impact
Roads	Flood	Exposure
Railways	Flood	Exposure
Schools & health facilities	Flood	Exposure

For both the hazard and impact and vulnerability assessment layers, the user can manipulate the transparency of the data layer using a slider ( ). 'Map' icons ( ) next to each layer allow the user to see the respective map of that layer (appearing on a separate screen after clicking the icon), while a 'download' button ( ) allows the user to see the complete impact and vulnerability assessment results (also shown on a separate screen).

Figure 15: Example of the map viewer when selecting impact and vulnerability assessment layers: exposure of roads to pluvial floods

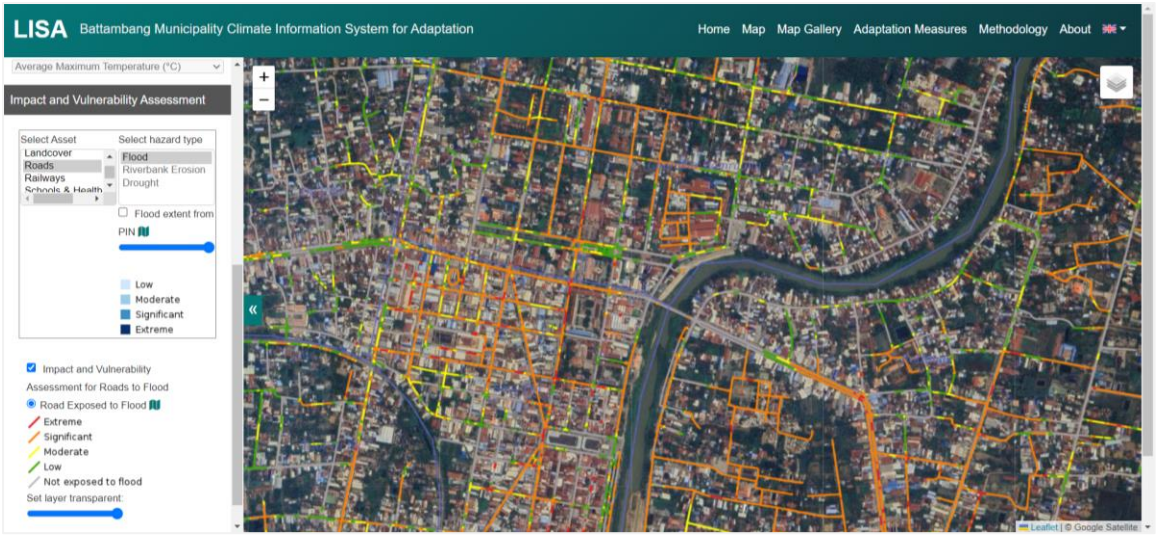


Figure 16: Example of the map viewer when selecting impact and vulnerability assessment layers: adaptive capacity of villages

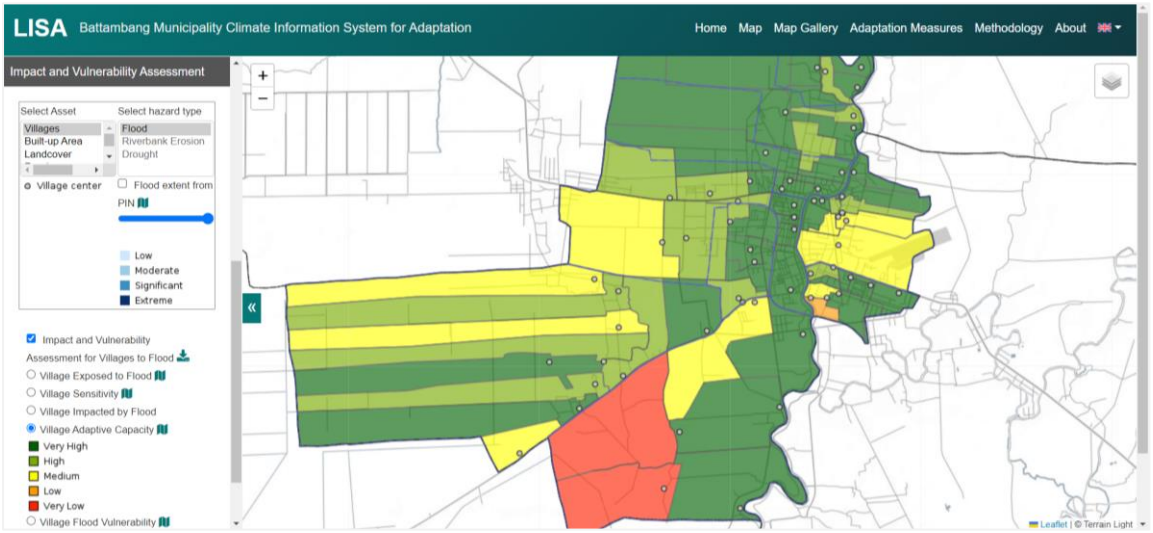
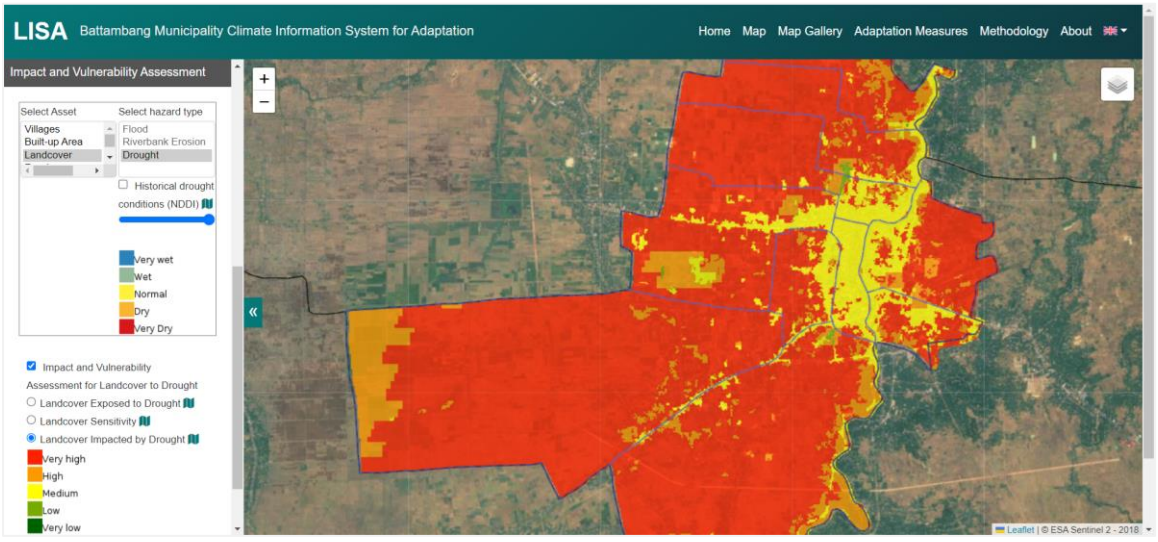


Figure 17: Example of the map viewer when selecting impact and vulnerability assessment layers: impact of drought on landcover



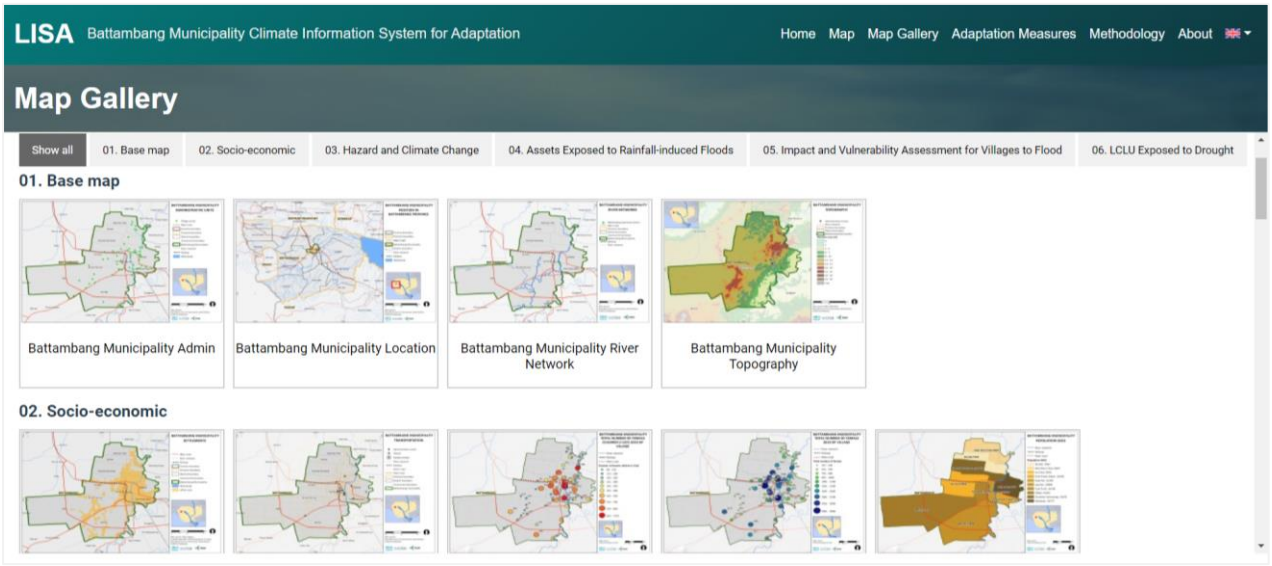
2.3 Map gallery

The map gallery page of the LISA platform includes 41 maps developed as part of the Battambang municipality impact and vulnerability assessment report. The maps are all downloadable in high resolution and have been grouped as per the following categories (Figure 18):

- Base maps;
- Socio-economic maps;
- Hazards and climate change;
- Assets exposed to rainfall-induced floods;
- Impact and vulnerability assessment for villages to flood; and
- Land cover land use exposed to drought.

The page has a 'search' box to allow the user to search the maps for key words.

Figure 18: The LISA map gallery page



2.4 Adaptation measures

The adaptation measures page presents a range of measures with potential to build climate resilience in Battambang municipality. The list of 23 measures focuses on nature-based solutions and green infrastructure. The list helps the user identify potential measures in response to the hazards, climate change, impacts and vulnerabilities identified and analysed through the map viewer function of the LISA platform.

The adaptation measures page contains a table of all the measures (Figure 20). In the table, the measures are grouped by urban area (urban or suburban), type of urban asset (streets, rivers, public spaces or buildings), cost (low, medium or high), hazard and intended results of the measures (efficient water management, building resilience, protecting biodiversity and social inclusion) (Figure 19).

Figure 19: Categorization of adaptation measures

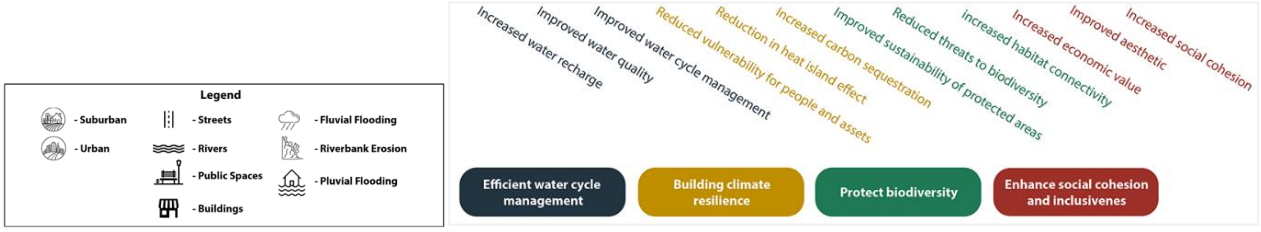
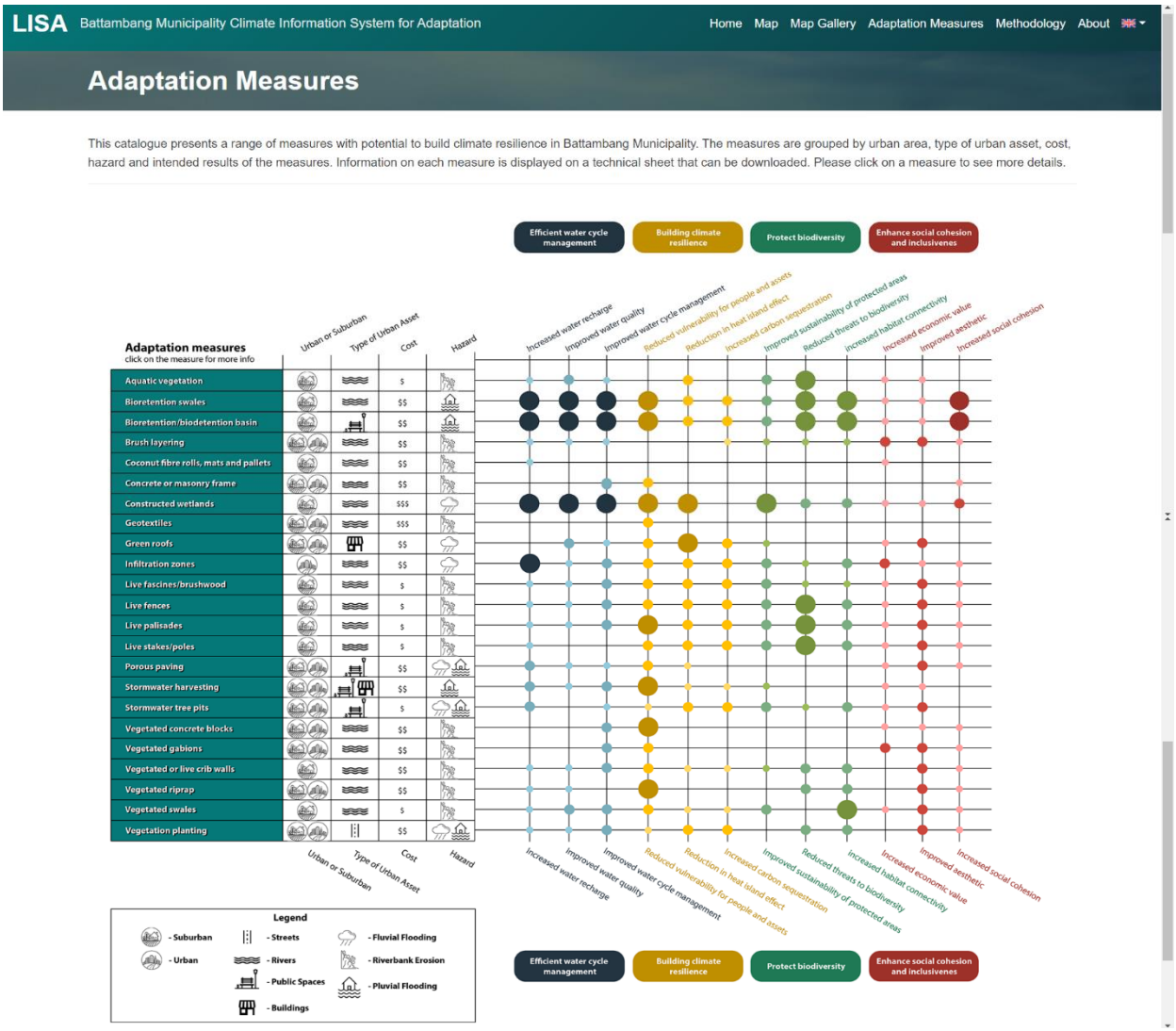


Figure 20: The LISA adaptation measures page



The first column of the table which contains the list of adaptation measures is clickable. When clicking on the name of the measure, information on each measure as well as concept visuals are displayed in a technical sheet (Figure 21) that can be downloaded (Download PDF) (Figure 22).
Each technical sheet contains detailed information on:

- *Overall technical description;*
- *Location;*
- *Design options and performance;*
- *Feasibility criteria;*
- *Operation and maintenance;*
- *Cost and benefits;*
- *Design solution;*
- *Environmental performance;*
- *Sources;* and
- *Concept visuals.*

Figure 21: Example of a technical sheet for vegetated gabions as adaptation measure

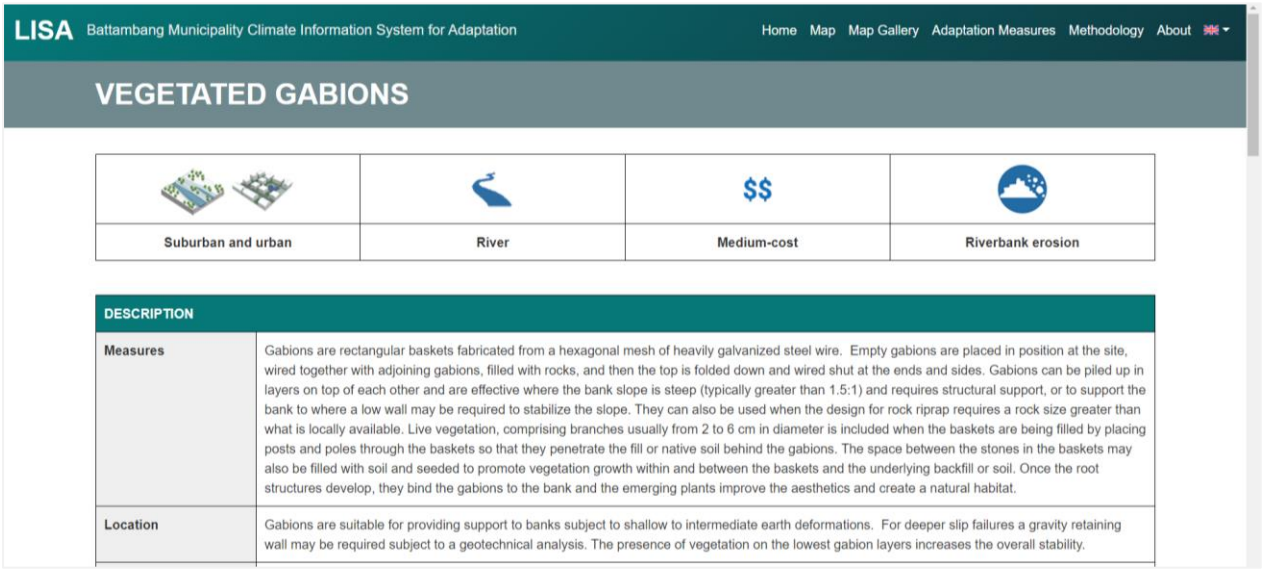


Figure 22: Example of a concept visual for vegetation gabions as adaptation measure

2.5 Methodology

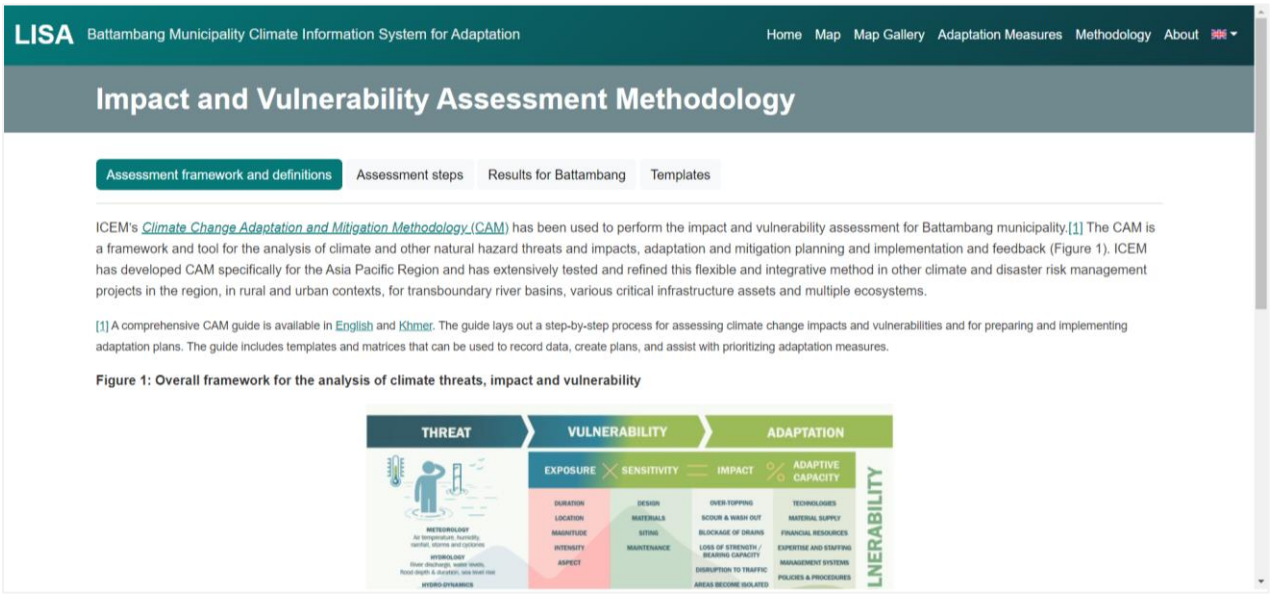
The methodology page provides details about the methodology that has been used for the Battambang municipality climate change impact and vulnerability assessment. It contains the following subsections (Figure 23):

- *Assessment framework and definitions*: detailing the framework and terminology;
- *Assessment steps*: describing the 12-step adaptation planning process;
- *Results for Battambang*: showing the assessment results in table format; and
- *Templates*: including a template for conducting a field-based vulnerability assessment.

The page also includes a link to a detailed manual, in English and Khmer, for assessing climate change impacts and vulnerabilities and for preparing and implementing adaptation plans.

On the results for Battambang subpage, the full Battambang Municipality Impact and Vulnerability Assessment Report can also be downloaded.

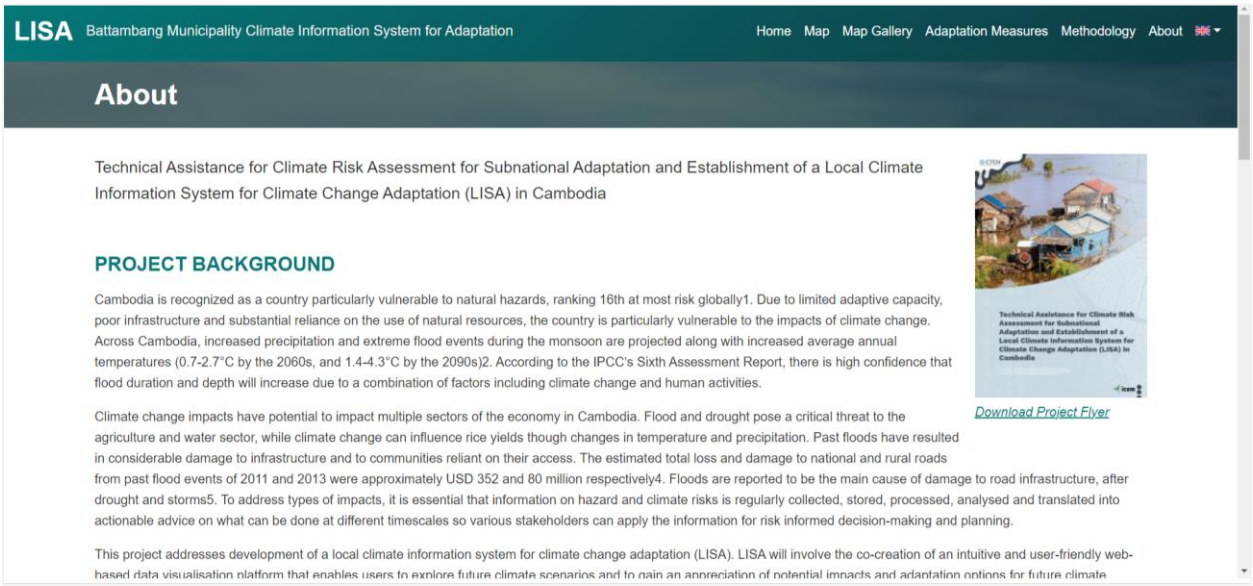
Figure 23: The LISA methodology page



2.6 About

The About page contains information about the project background, objectives, study area, and key outputs. The page also includes a project flyer which can be downloaded.

Figure 24: The LISA About page



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