Section 5. Terms of Reference

DEVELOPMENT OF CLIMATE CHANGE INFORMATION AND KNOWLEDGE MANAGEMENT PORTAL OF MOLDOVA

Table of Contents

General information

Knowledge and information management - including acquisition, transfer, use and sharing of knowledge - is essential element of effective climate adaptation. Each stage of CCA and DRR processes (Figure 1) is associated with a specific type of information and involve specific set of actors at all levels. The variety of objectives, sources and users of data and information make knowledge management for climate change adaptation a challenging task. The main challenges include:

- variety of thematic areas including climate change and climate projections, assessment of the risks and impacts, developing practical responses, implementation and management, monitoring and evaluation of the effectiveness of the results and others;
- variety of information sources and domains, including scientific knowledge on climate scenarios, local knowledge about impacts and effectiveness of the measures, planning and management of climate adaptation and others;
- different backgrounds of data users and providers which requires adapting the content, level and type of information to different user groups;
- attribution of different types of information to different administrative levels (e.g. the information about climate change and forecasts are usually produced at the international and national level, while information about impacts is mostly available at the local and sectoral levels);
- high level of uncertainty related to climate change and impacts and the need to communicate it to different stakeholder groups, providers and users of information;
- different time horizons for data, knowledge and information.

Information and knowledge management for climate change adaptation is a multi-level, dynamic and complex process involving different groups of information providers and users and different types of information. Effective CCA information management requires mechanisms and tools for knowledge integration, collection and sharing.

Digital solutions, including web-based CCA information and knowledge platforms, provide technological opportunity for the knowledge integration. Nevertheless, the structure, development and management of the web-based resources need to be carefully and realistically planned based on specific national circumstances, data available and stakeholder requirements.

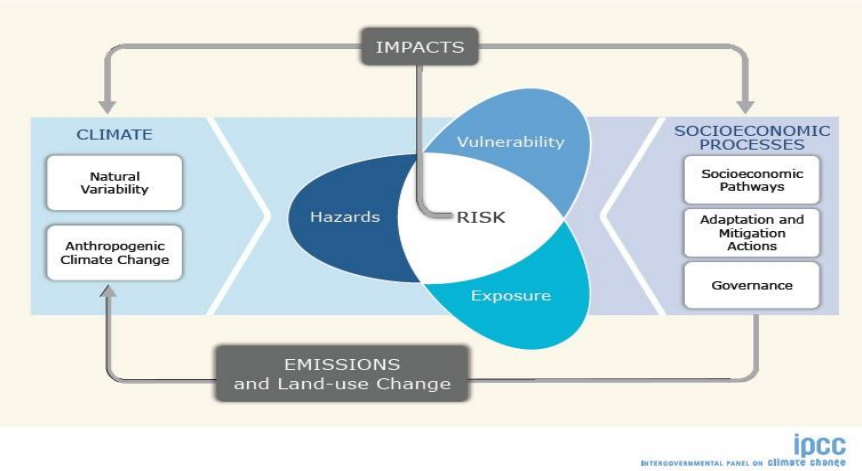


Figure 1. IPCC framing of climate risks and risk responses (AR5, IPCC, 2014b)

As Moldova progresses in its adoption of a holistic approach to adaptation and towards increased integration of CCA considerations into medium- and long-term planning, it must rely on a strong evidence base to strengthen its ability to appraise available adaptation options. There is a need to strengthen the knowledge

base for CCA and focus on improving the accessibility and availability of climate-related information through a climate change information and knowledge management portal (CCIKMP). Web-based CCIKMP is planned as the main source of information for all target groups that have interest in CCA domain. It is expected that this resource will be a key resource that will provide data for the Republic of Moldova on historical, future climate; existing and projected vulnerabilities and possible impacts on the level of various sectors (e.g. water, health) and regions (North, South and Center). CCIKMP is seen as a "one stop shop" for climate adaptation related information, tools, data that do exist on the national level, integrate the existing open data from available regionally and globally on climate, trends, vulnerabilities.

Terminology

Set of abbreviations and acronyms used in this document are defined in table 1.1.

Table 1.1. Acronyms and abbreviations used in the document

№	Abbreviation/Acronym	Description
1.	AP	Web-based climate change adaptation platform
2.	CCA	Climate change adaptation
3.	CCIKMP	Moldova Climate Change Information and Knowledge Management Platform
4.	DRM	Disaster risk management
5.	DRR	Disaster risk reduction
6.	EEA	European Environmental Agency
7.	GIES	General Inspectorate for Emergency Situations
8.	IEG	Institute of Ecology and Geography
9.	PSA	Public Services Agency
10.	KMS	Knowledge Management Strategy
11.	LAP	Local adaptation plan
12.	MoEnv	Ministry of Environment
13.	NAP	National Adaptation Plan (in the context of the document refers to NAP 2014 – 2020)
14.	NAP-2	Second cycle of updating and developing the NAP in Moldova
15.	NCCC	National Committee on Climate Change
16.	NDC	Nationally Determined Contributions
17.	NGO	non-governmental organisation
18.	SHS	State Hydrometeorological Service
19.	SDD	Software design document - the regulating document of the IT system containing the detailed description of the following images: data structures and their restrictions, architecture of the IT system covering all concept of the IT system, the IT interface of system including design of all components of the user interface, functionality of the IT system with the detailed description of all scenarios of implementation of the IT system.
20.	SRS	Software Requirements Specification – the document which contains the detailed description of all scenarios of interaction of users with IT application.
21.	TLS/SSL	The TLS protocol, and also his predecessor the SSL protocol, are intended for providing three services to all appendices working on it namely: enciphering, authentication and integrity.

All terms which are often used in this document are displayed and are provided in table 1.2.

Table 1.2. Determinations of the concepts used in the document

№	Term	Description
1.	CAPTCHA («Completely Automated Public Turing test to tell Computers and Humans Apart»)	A computer test used to determine whether a user of a system is a human or a computer. The main idea of the test: to offer the user a problem that a person can solve, but which is extremely difficult to teach a computer to solve. CAPTCHAs are most commonly used to prevent automated message submissions, registrations, file downloads, bulk emails, and more.
2.	CMS	A content management system, often abbreviated as CMS, is software that helps users create, manage, and modify content on a website without the need for specialized technical knowledge.
3.	IP address	The address of a node in an IP network.
4.	RSS	A data format intended for describing news feeds, article announcements, changes in blogs, etc. Information from various sources presented in RSS format can be collected, processed and presented to the user in a convenient form by special aggregator programs.
5.	World wide web (WWW)	A distributed system that provides access to related documents located on various computers connected to the Internet. The prefix "web" can be used to denote objects that are oriented to use on the WWW or that use typical WWW technologies (for example, a web interface is a web page-based interface).
6.	Administrative part of the portal	Part of the portal, closed from visitors, intended for portal management. Management is carried out by the administrator (technical support) and the portal editor (information support).
7.	Portal administrator	A specialist who provides technical support for the portal.
8.	Alternative figure signature	Text caption that appears in place of the picture if images are disabled in the web browser.
9.	Blog	A site or section of a site whose main content is regularly added posts containing text, images, or multimedia. Blogs are characterized by short entries that are relevant at the moment, sorted in reverse chronological order (last entry from the top).
10.	Web browser (browser)	Client program provided by third parties that allows you to view the content of web pages.
11.	Web Interface	A collection of screens and system controls that allow a user accessing the system via a web browser to maintain and manage the system.
12.	Web Portal (Portal)	A collection of interconnected static and dynamic pages containing text data, pictures, videos and other digital information, combined under one address (domain name or IP address) on the Internet.
13.	Hyperlink (link)	An active piece of text or image that allows you to load another page or perform a specific action.

№	Term	Description
14.	Portal design	Structure, graphics and presentation of information unique to a particular portal.
15.	Page design template	A file that contains elements of the external design of the site pages, as well as a set of special tags used by the site publishing system to display information when creating the final pages.
16.	Dynamic page	A poral page that, using program code, processes and displays information from the database.
17.	Domain name	The symbolic name of the hierarchical space of the Internet. The fully qualified domain name consists of the names of all domains in which it belongs, separated by periods.
18.	Meta tag	Web page markup element. Used for page description, keywords and other data.
19.	Content editor of the portal	A specialist who provides information support for the portal. He can create content without the right to publish on the portal (acceptance by Content manager required).
20.	Content manager of the portal	A specialist who provides information support for the portal. Manages editors.
21.	Filling (content)	The collection of portal content. Includes texts, images, files, etc. intended for portal users.
22.	Public part of the portal	The main informational part of the portal, open to visitors.
23.	Backup copy	A collection of database objects, presented in the form of files, that allows you to restore an exact copy of the structure of the original database in a similar database management system.
24.	Content Management System (CMS)	An information system that allows authorized users to make changes to the hierarchical structure and content of the portal without using any additional special software.
25.	Static page	A portal page that does not access the database; all information is stored in the page code.
26.	Hosting	A service for the provision of disk space for the physical placement of information on a server that is permanently located on the Internet.
27.	Content element	A separate entry in the database, the external presentation of which depends on the program module that controls it (for example, in the "news feed" module, the content element is a separate news).
28.	Database	Data set, organized according to the conceptual structure describing characteristics of these data and relationship between them, and such collection of data which supports one or more scopes.
29.	Information and communication technologies	The general term which includes all technologies used for the exchange and information processing.

№	Term	Description
30.	Information object	Virtual view of the existing material and non-material entities.
31.	Information system	The system for information processing along with the appropriate organizational resources, such as human and technical resources which deliver and to distribute information.
32.	Information resource	Set of documentary information in the IT system which is supported according to requirements and the current legislation.
33.	Logging	Function of the data recording about events. Records about the events entered into information systems include data on the date and time, users and the performed activity.
34.	Personal data	Any information relating to the identified or identified physical person (the subject of personal data). For this purpose, the identified person, is the one who can be identified, directly or indirectly, in particular, by means of the link to identification number or on one or more specific elements describing the person: physical, physiological, mental, economic, cultural or social identity.

Legal aspects for development of portal

The processes of creation, implementation and operation of CCIKMP are part of the normative-legislative framework in force. From this category of normative acts, we can mention:

- Law no. 467/2003 on computerization and state information resources;
- Law no. 71/2007 regarding the registers;
- Law no. 133/2011 on the protection of personal data;
- Law no. 142/2018 on data exchange and interoperability;
- Government Decision no. 562/2006 on the creation of state automated information systems and resources;
- The requirements for ensuring the security of personal data when processing them within the personal data information systems, approved by Government Decision no. 1123/2010;
- The Program on the Interoperability Framework, approved by Government Decision no. 656/2012;
- Regulation on the use, administration and development of the common technology platform (MCloud), approved by Government Decision no. 128/2014;
- The mandatory minimum requirements for cyber security, approved by Government Decision no. 201/2017;
- Government Decision no. 414/2018 on measures to strengthen data centers in the public sector and to streamline the administration of state information systems;
- Regulation on the use of the interoperability platform (MConnect), approved by Government Decision no. 211/2019;
- The technical regulation “Software life cycle processes” RT 38370656-002: 2006, approved by the Order of the Minister of Information Development no. 78/2006.

Portal architecture

The architecture of the CCIKMP portal is represented in figure 1.1.

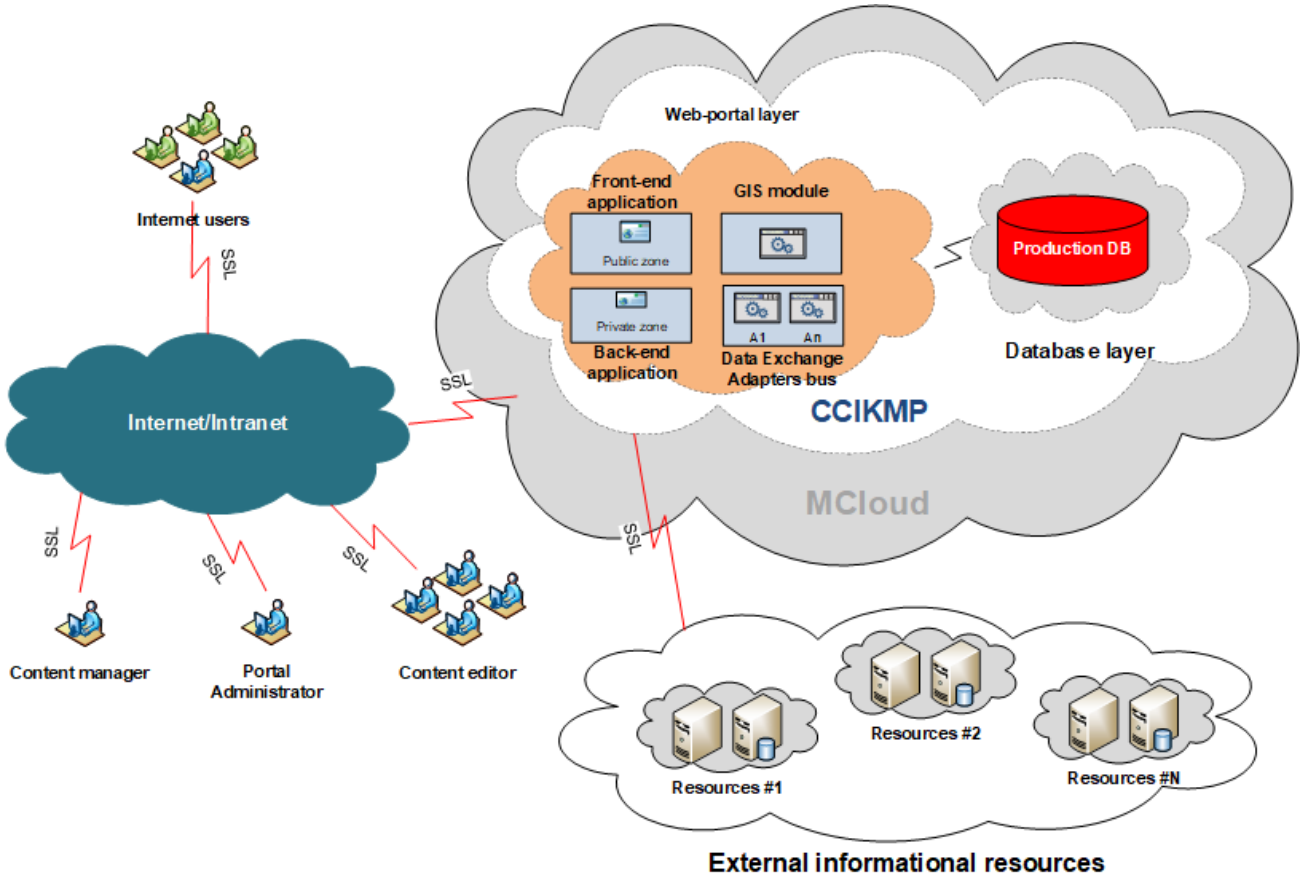


Figure 1.1. CCIKMP Portal components and the interaction between them.

Thus, the portal will contain 4 functional blocks that interact with each other:

Front-end application - is intended for Internet users to browse and view the public content of the portal.

Back-end application - it is a private zone and is intended for users responsible for completing and administering the portal (CMS).

GIS module - is intended for users responsible for managing the portal and allows the creation of templates with interactive maps using geospatial data imported from external resources. This module can use a different management engine than the portal engine. Widgets will be used to publish interactive maps from this module to the portal.

Data Exchange Adapter bus - Data Exchange Adapters Bus provides multilevel integration with external informational resources. The mentioned module is meant for the import of geospatial data delivered by the Providers both from external files and through web-services.

The involved parties and roles in portal

Business roles in Portal

Key stakeholders for the implementation of CCIKMP are as follows:

- SHS – the main beneficiary and owner of the CCIKMP;
- UNDP (Project NAP-2) – the Purchaser of the development and implementation of CCIKMP. The UNDP will monitor all Project activities;

- Ministry of Environment - the central specialized body of the public administration that ensures the realization of the governmental policy in the fields relevant to CCIKMP;
- ITCSS – the owner of MCloud where the CCIKMP will be hosted and the Technical Administrator of the of the integrated software;
- e-Government Agency –the agency responsible for the government e-Transformation agenda implementation and access to MConnect interoperability platform and APIs of government e-services (MPass, MSign, MLog, MNotify, MPay, MPower, Open Data Portal and Public Services Portal).

Owner of Portal

SHS is the owner of CCIKMP. The role of the owner of portal reflects the administrative aspect connected with complete competence of the organization which are necessary for ensuring continuous management and development of system.

As the owner of System, the SHS will be able to assign roles and access rights to the portal to the employees of public institutions, depending on their duties.

The SHS will provide technical infrastructure for placement of the developed portal.

Users and their roles in Portal

The user roles or information systems which interact with CCIKMP are displayed in figure 1.2. Apparently in this drawing, 4 categories of human actors and a few of external resources will interact within this portal.

Internet user - a human actor, who accesses the public WEB interface of CCIKMP in order to explore the public information related to the portal. The given actor has the role of accessing the WEB interface for exploring the public content of the portal (public area).

Content editor - the human actor intended for created and edited of content for portal.

Content manager - the human actor intended for management of portal's content. This category of actors has the following different roles:

- creating content on the portal;
- publishing content on the portal, including that created by publishers;
- excluding the content from the portal.

Portal administrator - the human actor intended for management of users of portal, system operation monitoring, configuring/setup of portal, start / stop / restart of portal. This category of actors has the following different roles:

- Uses everything functionality of portal;
- Generate the reports, statistics and performance indicators intended for monitoring of system;
- User management: creating, blocking, deleting, assigning role;
- manage and configure roles, access rights and profiles of authorized users of system;
- perform system configurations, including notifications of different type of users;
- manage metadata of system (the configuration, the access path, accounting data for access to external services, nomenclatures, qualifiers, variables, etc.);
- administration of the CMS;
- administration of the database;
- database backup.

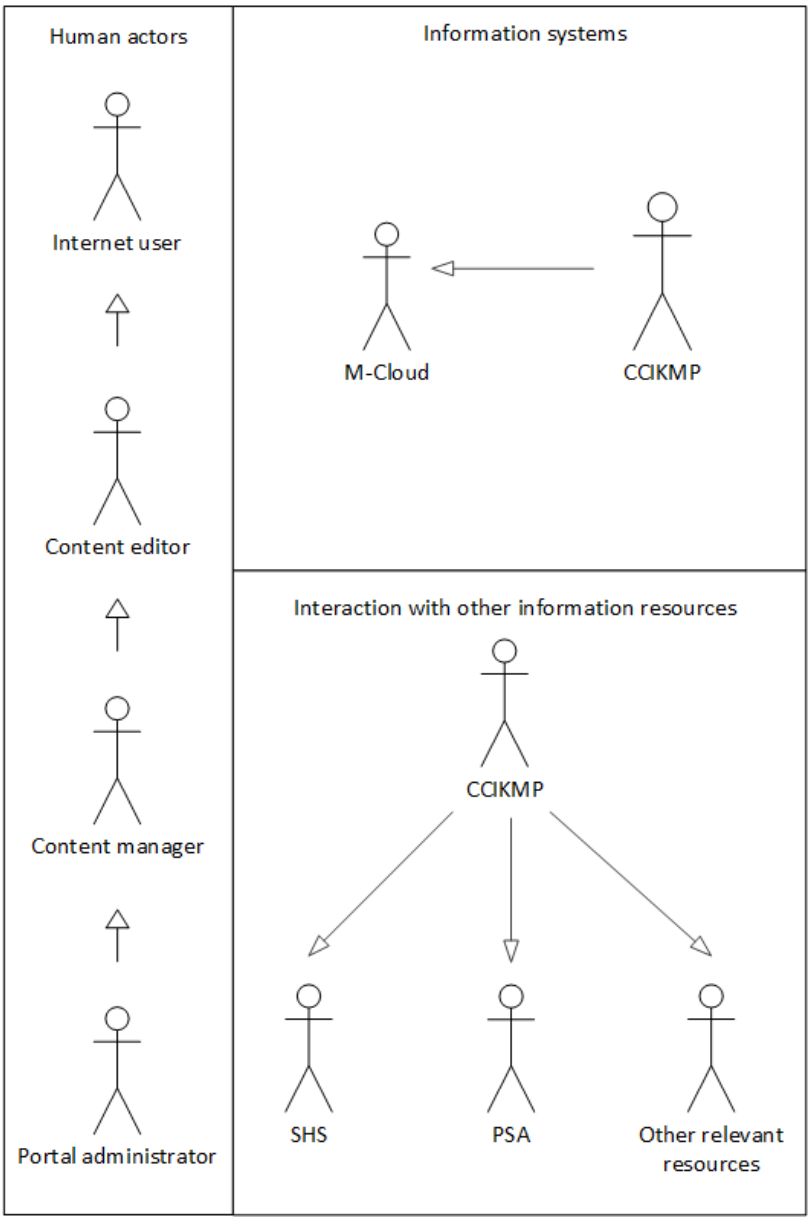


Fig. 1.2. The actors of the Portal

External resources - represent the totality of external information resources with which CCIKMP will be integrated. It is necessary to organize access to the information resources of the following state institutions:

- SHS – providing meteorological information, hydrological, air pollution and other data (layer with data for interactive maps or widget for displaying in portal);
- PSA – providing layer with data for interactive maps (data from the State Register of administrative-territorial units and addresses);
- Other relevant resources – layer with data for interactive maps or widget for displaying in portal (ex. IEG, Apele Moldovei, Moldsilva, Environmental agency and other research institutions and agencies providing spatial information on climate parameters and risk assessments).

The list of data providers for the portal is presented in Annex # 2

M-Cloud - a common government technology platform based on the modern concept of "Cloud Computing" consisting of computing services, applications, access to information and data storage. CCIKMP will be hosted on M-Cloud.

Functional model of Portal

Information objects of Portal

Analyzing the modeled domain can be delimited all the informational objects that must be considered when developing CCIKMP. Figure 1.3 delimits all the information objects that will underlie the development of CCIKMP.

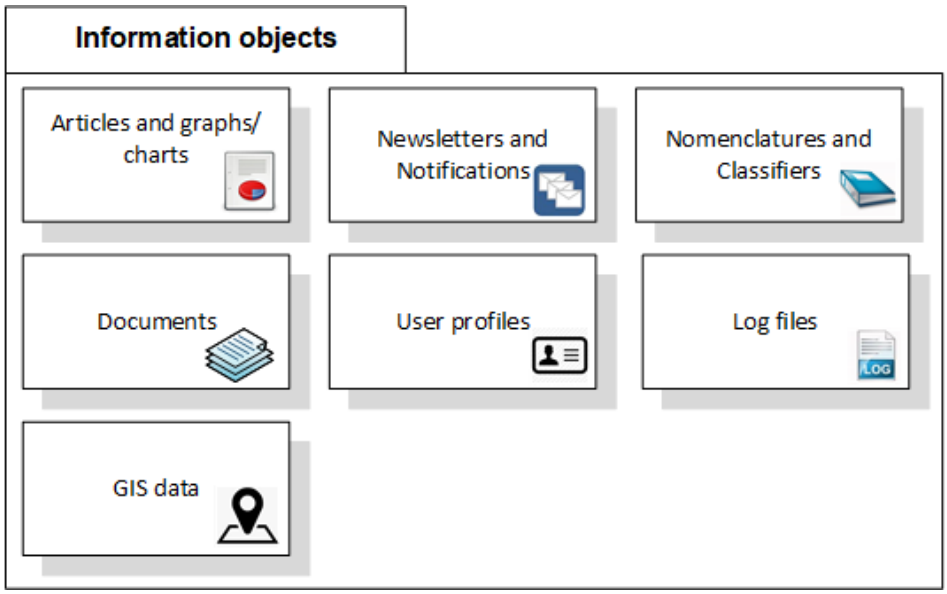


Fig. 1.3. The informational objects of the Portal

As can be seen in Figure 1.3, we can mention 7 categories of information objects that must be considered in the CCIKMP development process:

- Articles and graphs/charts;
- Documents;
- GIS data;
- Newsletters and Notifications;
- User profiles;
- Nomenclatures and Classifiers;
- Log files.

1. **Articles and graphs/charts.** Article is a piece of content consisting of text (HTML), possibly with links to other resources (for example, images). Articles are the basic units of information in the content system and the bottom level in the content hierarchy. Graphs and charts are visuals that show relationships between data and are intended to display the data in a way that is easy to understand and remember. Graphs and charts can be included in the article or displayed separately. Articles will be placed in Categories. Separate categories and subcategories will be created for each item in the Portal menu.
2. **Documents.** Represents an information object of the system, which can be of study, report, policy or a normative act. It will be stored in the portal as an external file in PDF format and can be attached to any article or displayed separately.
3. **GIS data.** Represents a category of information objects that consists of all geospatial data and related data for display on interactive maps of the portal.
4. **Newsletters and Notifications.** This category of information objects is part of the CCIKMP notification and subscribe to newsletters mechanism. The following CCIKMP notifications and newsletters could be delineated:

- notification of the arrival of a new article for publication;
- notification regarding the change of the status of the article (published, rejected);
- notification of alerts published on the portal (risk of floods, risk of frosts, others risks);
- newsletters for subscriber users;
- other system notifications (warnings).

5. **User profiles.** User profiles are an informational object that consists of all data related to authorized users. The user profile will contain all the information related to it (information for authorization in the system, name, surname, authentication data, postal address, contact phone, Email, subscription status, etc.) and CCIKMP functionalities accessible to the user (rights and roles related to it). The user profile will deliver the history of his activity within CCIKMP.
6. **Nomenclatures and Classifiers.** Represents a category of information objects that consists of all metadata related to CCIKMP. It will contain national (relatively static) classifiers managed by SHS, data providers and internal portal nomenclatures.
7. **Log files.** Represents information objects intended for IT audit and implementation of information security policy. Any changes to the content of the portal must be recorded in special logs (log files) showing the time and the user who made the change.

Functionality of Portal

All the functionalities delivered by CCIKMP and the actors that benefit within the key institutions of CCIKMP are shown in figure 1.4. It should be noted that human sketches represent external users or resources for which the interaction interfaces with them must be adapted.

According to the use case diagram described in figure 1.4, the CCKIMP actors within SHS and the state institutions responsible for providing information for the portal have access to 9 use cases.

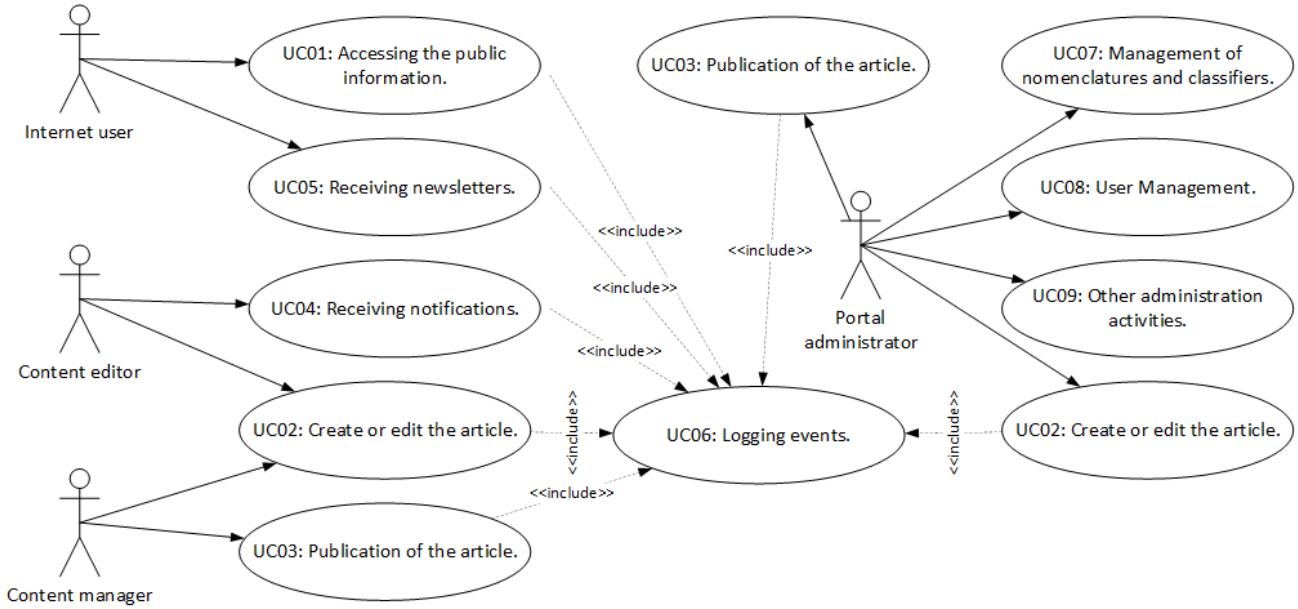


Figure 1.4. Portal functionalities

UC01: Accessing the public information.

Publicly available functionality for all Internet users - information seekers, through which they can query the database in order to search for public information or extract depersonalized public information.

UC02: Create or edit the article.

Represents a functionality available to users with the roles "Content editor" and "Content manager" for creating or editing the new (content) or existing article in the Portal.

UC03: Publication of the article.

Represents a functionality available to users with the role of "Content manager" for publishing the new (content) or modified article on the Portal.

UC04: Receiving notifications.

Represents a feature available to CCIKMP users for receiving notification messages involved (responsible) for filling the portal with content. The portal will provide users with notifications regarding any event aimed at changing the content status of the portal.

UC05: Receiving newsletters.

This is a feature available to CCIKMP subscribers to receive newsletters. The portal will provide users with the opportunity to subscribe to newsletters.

UC06: Logging events.

The portal will contain all the functionalities that will allow the configuration of the operating principles and the generation of the events that will be logged.

UC07: Management of nomenclatures and classifiers.

Use case that provides all the functionalities necessary for the administration of the nomenclatures and classifiers of the portal.

UC08: User Management.

Represents a use case that provides all the functionality intended for the portal administrator through which he manages the list of roles and rights associated with authorized users.

UC09: Other administration activities.

Represents a use case for the portal administrator that describes all the functionalities accessible to them for CCIKMP administration and audit: maintaining the list and integrity of user credentials, extracting reports from system registers for analysis and detection of possible logical and physical security issues of CCIKMP, etc.

The Portal Administrator will have a mechanism for managing the profiles of the portal actors involved in the content completion process. This mechanism will allow you to define the parameters for accessing the interface, services, files. Additionally, the portal administrator will have a mechanism for managing the GIS component of the portal, including managing the integration part with the web-services of external resources.

The CCIKMP administration use case will implement all the functionalities of ensuring the viability and integrity of the portal (generating backups, restoring data, starting/stopping the portal, etc.).

User interface of Portal

The user interface of the portal should provide a visual, intuitive presentation of the structure of the information posted on it, a quick and logical transition to sections and pages. Navigation elements should provide an unambiguous understanding of their meaning by the user: links to pages should be provided with titles, conventions should correspond to generally accepted ones. Graphical navigation elements must be provided with an alternative signature.

The system should provide navigation through all resources available to the user and display relevant information. The content menu system must be used for navigation. The menu should be a text box (list of hyperlinks) in the left column or at the top of the page (depending on the approved design).

For sections containing subsections, there should be a drop-down submenu.

When a user selects any of the menu items, the corresponding information page (news feed, feedback form, etc.) should be loaded, and a list of subsections of the selected section should open in the menu block (or in the main part of the page, depending on the approved design).

The CCIKMP public area will have interfaces in 2 languages: Romanian and English. When creating a portal, an adaptive design should be used that allows viewing the site both on workstations and on any mobile devices (tablets, smartphones with a minimum resolution of 640x480 px and with browsers that support HTML5), depending on the requesting device.

The design of the portal must be attractive, with the sobriety necessary for the image of a public institution, but without giving the impression of rigidity.

The contrast between the letters / writing and the background must be large enough for a quick view of the content. The fonts used will ensure the readability of the text regardless of the browser or the users' platform.

Graphic proposals must create a unified and recognizable visual concept and adhere to the attached draft layout. The developer will present two design variants of the portal from which one will be chosen (a report will be drawn up with the chosen proposal attached). The selected variant of design will include the icon sets for the portal.

Content management system (CMS) and portal content

Pages of all sections of the portal must be generated programmatically based on information from the database on the server.

The content management system should be convenient for the average user in terms of:

- Ease of transferring content from MS Office applications, editing it, placing tables and images, as well as downloading them from the outside.
- Ease of placing banners (start of publication and completion date of publication on the site), attached files (pdf, doc, xls, etc), photo galleries (including the article itself).
- Convenient search for the desired page for editing by word combination, link. The search function must be able to search for a product by name in any of the 2 languages of the site, regardless of the language selected for viewing the site.
- At the article level, specify the intro text and intro image, and of course the full text with the corresponding image.
- At the article level, indicate the start date of publication and the date of completion of the publication on the site.

Modification of the content of the sections should be carried out through the administrator's web interface (content management system), which, without the use of special programming skills (without the use of programming and special coding or formatting), should provide for the possibility of editing the information content of the portal pages. Filling with information should be carried out using the templates of the portal pages.

As part of the development of the portal, the Contractor must ensure that the static information provided by the Customer is entered into the dynamic sections being created (considering the functionality provided for in this TOR). Text information will have to be provided by the Customer in the form of separate files in MS Word, MS Excel, html format. The file names will correspond to the titles of the sections. Before transferring the texts to the Contractor, they will be proofread and edited. Graphic material will be provided in psd/png/tiff format. Whenever possible, the names of the graphic files will reflect the contents of the file. Images for galleries and portal sections will be placed in folders or archives with names corresponding to the gallery or portal section for which they are intended.

The contractor must ensure the processing of illustrations to bring them in line with the technical requirements and HTML-layout of the prepared materials. If additional processing is required (typing, proofreading, scanning, retouching, editing, translation, etc.), this will be done by the Customer.

After the portal is put into operation, the content of the sections, including the processing and preparation for publication of graphic materials, must be carried out by the Customer independently or on the basis of a separate contract for the portal support.

Portal analytics

There are various web analytics tools for collecting statistics, which are classified into two types.

The first is Internet statistics systems. These are external programs for which a small piece of code is installed on the portal. The data is entered into a database located on the server of the service provider. They are available to the owner of the web resource. Such programs are simple and easy to use. They provide visual information. Examples: Google Analytics, Yandex.Metrica, Liveinternet and others.

Log analyzers are programs installed on a user's computer. Log files are collected at regular intervals, processed and stored in an internal archive. As a rule, working with such tools requires special knowledge and skills. Examples: Webalizer, AWStats (they are usually provided by hosting providers).

The proposed Internet statistics system should provide the following indicators:

- attendance indicators:
    - how many pages were viewed in total;
    - detailed path on the site of one visitor - where he visited, how often;
    - total number of users;
    - new visitors to the portal.
- audience characteristics:
    - geographic location - determined by the IP address of the user's device;
    - indicators of audience activity;
    - visitor's interest is determined by the time spent by the user on the portal.
- traffic sources:
    - sites from which visitors came;
    - where users came from - search engines, individual resources and blogs, social networks and others;
    - transitional search queries - for what key phrases the visitor found the portal.
- popularity of pages and sections of the portal:
    - most visited pages - calculated from the total number of views;
    - most viewed page groups - similar metrics are shown for the pages of the subdirectory;
    - list of pages visited by the user during one session.
- internal indicators of the portal:
    - information about subscribers: a list of subscribers for an arbitrary period;

- search queries on the portal for an arbitrary period.

Requirements to Portal

Remark:

The requirements set out in this document are marked using the following convention: X Y Z, where:

X - represents the requirement category and can have one of the following values: FR - functional requirement or NFR - non-functional requirement, TDR - testing and documentation requirement

Y - represents the use case number (UC).

Z - represents the serial number of the requirement for the given use case.

Example: FR 02.05 - is the functional requirement with order number 05 corresponding to the use case UC 02

For each functional or non-functional requirement, indicate whether it is mandatory (M), optional (D) or Informative (I).

The tender submitted by the tenderer must comply with all the requirements indicated as mandatory (M).

The bid submitted by the bidder will gain a competitive advantage for each optional requirement (D) to which it corresponds.

Information requirements (I) are intended to provide more information in order to better understand the context of other requirements.

Functional requirements to Portal

UC01: Accessing the public information.

Functional requirements for use case UC01: Accessing the public information are outlined in Table 1.3.

Table 1.3. All functional requirements for use case UC01

Identifier	Type	Description of the functional requirement
FR 01.01	M	CCIKMP will provide a WEB interface for accessing the public content of the portal.
FR 01.02	M	The public WEB interface will display information that does not contain personal data.
FR 01.03	M	Due to the responsive design, the Portal will be accessible from any device: desktop, laptop, tablet, smartphone.

UC02: Create or edit the article.

Functional requirements for use case UC02: Create or edit the article are outlined in Table 1.4.

Table 1.4. All functional requirements for use case UC02

Identifier	Type	Description of the functional requirement
FR 02.01	M	The back-end of portal will offer users the role of "Content editor" the ability to create new articles or modify existing articles created by them. Articles can only be created in the Categories attached to this user group.
FR 02.02	M	The back-end of portal will offer users with roles "Content manager", “Portal administrator” the ability to create new articles or modify existing articles regardless of their author. This category of users can remove articles from the portal.
FR 02.03	M	Due to the responsive design, the back-end of Portal will be accessible from any device: desktop, laptop, tablet, smartphone.
FR 02.04	M	The portal will allow the insertion of predefined interactive maps from the GIS module of Portal or widgets from external resources in the body of the articles.
FR 02.05	M	To create/modify of articles, Portal will provide to users a special tool (WYSIWYG HTML editor).
FR 02.06	M	The portal will allow to create and insert of charts of different types (bar graphs, pie charts, line graphs) in the body of the articles.

UC03: Publication of the article.

Functional requirements for use case UC03: Publication of the article are outlined in Table 1.5.

Table 1.5. All functional requirements for use case UC03

Identifier	Type	Description of the functional requirement
FR 03.01	M	The portal will offer users with roles "Content manager", “Portal administrator” the opportunity to publish new articles created or modified by users with the role of "Content editor".
FR 03.02	M	The portal will offer users with the role of "Content manager" the possibility of refusing to publish new articles created or modified by users with the role of "Content editor" with their submission for correction to the authors of the articles.

UC04: Receiving notifications.

Functional requirements for use case UC04: Receiving notifications are outlined in Table 1.6.

Table 1.6. All functional requirements for use case UC04

Identifier	Type	Description of the functional requirement
FR 04.01	M	The portal will send to the users with the role of "Content manager" notifications regarding the publication of new / modified articles.
FR 04.02	M	The portal will send users with the role of "Content editor" notifications regarding the publication of new / modified articles or their rejection.

Identifier	Type	Description of the functional requirement
FR 04.03	M	The portal will send to the users with the role of "Portal administrator" notifications regarding the events that affect the security of the portal (unsuccessful authentication of users, etc.).

UC05: Receiving newsletters.

Functional requirements for use case UC05: Receiving newsletters are outlined in Table 1.7.

Table 1.7. All functional requirements for use case UC05

Identifier	Type	Description of the functional requirement
FR 05.01	M	The portal will offer internet users the possibility to subscribe/unsubscribe to newsletters.
FR 05.02	M	The component for subscribing and mailing letters should provide the following capabilities: - Subscription / Unsubscribe to mailing lists for portal users; - Verification of the postal address and its confirmation; - Creation of mailing lists; - User unsubscribe notifications; - Administrator notifications about user subscription/unsubscription; - Creation of newsletters; - Inserting personal data into any letter (placeholders); - Management of letter templates; - Sending letters on a schedule; - Insert images; - Adding files in the attachment; - Insert link "Send to a friend"; - Automatic creation and distribution of emails based on content; - Creation of automatic e-mail companies (a series of letters sent automatically based on user information); - Sending letters to one or more lists.

UC06: Logging events.

Functional requirements for use case UC06: Logging events are outlined in Table 1.8.

Table 1.8. All functional requirements for use case UC06

Identifier	Type	Description of the functional requirement
FR 06.01	M	The portal will designate the events to be journalized.
FR 06.02	M	The portal will offer users with the role of "Portal administrator" the ability to view and systematization of logs.

UC07: Management of nomenclatures and classifiers.

Functional requirements for use case UC07: Management of nomenclatures and classifiers are outlined in Table 1.9.

Table 1.9. All functional requirements for use case UC07

Identifier	Type	Description of the functional requirement
FR 07.01	M	The portal will have a mechanism for managing the nomenclatures and classifiers that contain all the metadata of the portal.
FR 07.02	M	The classifiers managed by SHS and data providers will be taken over in full.
FR 07.03	M	For data provider classifiers, the rights to make changes will be limited. Changes will be made to this category of classifiers only if they are operated by Data Providers.
FR 07.04	M	For the system of internal nomenclatures and classifiers, the IT solution will deliver a mechanism for their dynamic definition and administration.
FR 07.05	M	The portal will not allow deleting a metadata category if it is used in at least one database record.

UC08: User Management.

Functional requirements for use case UC08: User Management are outlined in Table 1.10.

Table 1.10. All functional requirements for use case UC08

Identifier	Type	Description of the functional requirement
FR 08.01	M	The portal will allow users with the role of "Administrator portal" to create new users, attach the role in the portal, reset the password, block or delete the user.
FR 08.02	M	The portal will allow users with the role of "Administrator portal" to dynamically configure roles and attach them to users.
FR 08.03	I	The beneficiary will provide all the necessary information to complete the profiles of the users involved in the operation of the portal (Portal administrators, Content editors, Content managers).
FR 08.04	D	The portal will contain several default user categories created by the developer upon delivery of the final product. The user category will be delivered by the beneficiary.

UC09: Other administration activities.

Functional requirements for use case UC09: Other administration activities are outlined in Table 1.11.

Table 1.11. All functional requirements for use case UC09

Identifier	Type	Description of the functional requirement
FR 09.01	M	The portal must allow administrative roles to take over, display, and reconfigure parameters and settings of configuring the portal.
FR 09.02	M	The portal must allow the dynamic administration of all nomenclatures and classifiers.
FR 09.03	M	The administrator manages CCIKMP users and access groups.
FR 09.04	M	The portal must allow administrative roles to: - assign functions to users and roles; - assigns one or more users to a role.
FR 09.05	M	For each user of the Portal, the administrator manages his profile.
FR 09.06	M	The administrator manages the portal interaction module with external resources, including the GIS module.
FR 09.07	M	The administrator backs up and restores the functionality of the portal based on these copies.
FR 09.08	M	The administrator performs all the activities of ensuring the functionalities in good conditions of the portal.
FR 09.09	M	The portal must allow administrative roles to create an unlimited number of web feeds (RSS).

Nonfunctional requirements to Portal

General requirements to Portal and requirements to performance

General requirements to Portal and requirements to performance are outlined in Table 1.12.

Table 1.12. General requirements to Portal and requirements to performance

Identifier	Type	Description of the functional requirement
NFR 01.01	M	The developed portal will be hosted on the M-Cloud government technology platform and will run on this platform.
NFR 01.02	M	The average response time of the server will not exceed 3 seconds at the nominal load of the portal.
NFR 01.03	M	The portal must be able to allow the activity of more than 10 authorized users of the Portal.
NFR 01.04	M	The portal must be able to allow annual access to over 50,000 publicly accessible Internet users.
NFR 01.05	M	All CCIKMP performance tests will be performed prior to the delivery of the IT solution.
NFR 01.06	M	All user interfaces and the contents databases will be prepared in the Romanian and English languages.

Identifier	Type	Description of the functional requirement
NFR 01.07	M	The portal shall have possibility of setup of the user interface (the adaptive interface) depending on the used device (the notebook, the netbook, the desktop PC, the Tablet).
NFR 01.08	M	The portal should use open standards for formats and communication protocols.
NFR 01.09	M	The portal shall be displayed identically in the latest version of browsers: Chrome, Firefox, IE(Edge).
NFR 01.10	M	The portal must integrate with the following social networks and external resources: - Facebook - for each news / event the Like, Share and Send buttons. - Twitter - for each news / event the Share a link and Follow buttons. - Linkedin - for each news / event the Follow button.

Requirements to GIS module

Requirements to GIS module are outlined in Table 1.13.

Table 1.13. Requirements to GIS module

Identifier	Type	Description of the functional requirement
NFR 02.01	I	This module can use a different management engine than the portal engine.
NFR 02.02	M	Widgets will be used to publish interactive maps from this module to the portal.
NFR 02.03	M	It is necessary to provide for the import of vector maps from external files: SXF, KML, DXF and other frequently used formats, as well as their manual completion with additional data (not geospatial). It is necessary to be able to import data from external web-services.
NFR 02.04	M	The engine used must offer to users the following possibilities through widgets: - segmentation of map; - cutting on the map according to a defined area; - modeling.

Requirements to safety and protection of Portal

Requirements to safety and protection of Portal are outlined in Table 1.14.

Table 1.14. Requirements to safety and protection of Portal

Identifier	Type	Description of the functional requirement
NFR 03.01	M	The portal must report attempts to abusively enter the private area of the portal or to gain unauthorized access to the information.
NFR 03.02	M	The system will be protected from the following vulnerabilities: - Cross-site scripting (XSS) and reflected (RXSS)

Identifier	Type	Description of the functional requirement
		- Information leakage - Content spoofing - Predictable resource location - SQL injection - Insufficient authentication - Insufficient authorization - Abuse of functionality - Directory indexing - HTTP response splitting - Other known vulnerabilities in the programs used in the development of the platform.
NFR 03.03	M	On interaction of the Portal with other external resources, digital certificates for identification shall be used.
NFR 03.04	M	The portal shall provide confidentiality of the transmitted data obtained on communication links.
NFR 03.05	M	Access to the portal is controlled.
NFR 03.06	M	User actions are logged by portal.

Software, Hardware and requirements to communication link

Requirements to software, hardware and communication link are outlined in Table 1.15.

Table 1.15. Requirements to software, hardware and communication link

Identifier	Type	Description of the functional requirement
NFR 04.01	M	The portal shall have opportunity to be installed both on dedicated servers and on the virtual (Cloud).
NFR 04.02	M	The portal shall be available on communication links at the speed, at least: - For internet users - 256 kbps - For authenticated users - 100Mbps.
NFR 04.03	M	The developer shall specify the name of the software platform (CMS) on the basis of which the portal and type of databases necessary for functioning of portal will be developed in the sentence. Also, the developer shall be providing the requirements to hosting infrastructure.
NFR 04.04	M	If the platform of the software (CMS, GIS module and databases) used for development and operation of portal is based on the commercial IT solutions demanding purchase of licenses, the developer will include in the sentence delivery of all necessary licenses for development and operation of portal (The developer buys all licenses necessary for development and operation of portal on behalf of the Beneficiary).

Requirements to documentation of Portal

IT solution shall be followed by the complete documentation package on the deliverable portal consisting of the sections included in Table 1.16.

Table 1.16. Requirements to documentation of Portal

Identifier	Type	Description of the functional requirement
NFR 05.01	M	The developer shall prepare and deliver the Engineering design of portal (SRS+SDD).
NFR 05.02	M	The developer shall prepare and deliver the user guide in the Romanian language for all roles in portal.
NFR 05.03	M	The developer shall prepare and deliver the Administrator guide in the Romanian language.
NFR 05.04	M	The developer to prepare and deliver the Installation guide and setup of portal.

Requirements to technical maintenance of Portal

The developer shall provide the maintenance of portal after implementation. Requirements to the level of the maintenance are described in Table 1.17.

Table 1.17. Requirements to the level of the maintenance

Identifier	Type	Description of the functional requirement
NFR 06.01	M	The developer shall provide support within 12 months after acceptance of portal.
NFR 06.02	M	Support of portal shall conform to requirements of the national standard SM ISO / CEI 14764: 2005 - Information technologies. Service of the software.
NFR 06.03	M	The developer shall provide to the Receiver the service Help Desk available in all working days during the required period of maintenance.
NFR 06.04	M	For communication with Help Desk service will use one of the following languages: English or Romanian.
NFR 06.05	M	The developer shall provide documentation of technical requests of the Customer, and their traceability for the Receiver.
NFR 06.06	M	Terms for reaction and the decision for the registered requests: - Term for reaction - 4 hours - Term for implementation critical after reaction - 4 hours - Term for implementation noncritical after reaction - shall not exceed 24 hours eight working hours after their registration

End product and set of delivery

The end product consists of program artifacts and documentation of portal, and also knowledge transfer to the Beneficiary. The artifacts included in the set of delivery of portal are displayed in Table 1.18.

Table 1.18. Requirements to set of delivery

Identifier	Type	Description of the functional requirement
NFR 07.01	M	Engineering design of portal (SRS+SDD).
NFR 07.02	M	The manual on the installation and configuration of portal.
NFR 07.03	M	User guides for all roles in the portal.
NFR 07.04	M	The administrator guide (including the plan for the case of emergency situations).
NFR 07.05	M	The training documentation (it is intended for teachers who will train employees of other state institutions in operation of portal).
NFR 07.06	M	Testing plan, test cases and results of internal testings (functional).
NFR 07.07	M	All artifacts of system, copied on the electronic medium (CD or DVD).
NFR 07.08	M	The end product packed for easy installation in the offered technology environment.

In addition to the artifacts, which are included in the portal of delivery, all the services necessary for the transfer of knowledge are listed in Table 1.19.

Table 1.19. Requirements to knowledge transfer

Identifier	Type	Description of the functional requirement
NFR 07.09	M	User training and system administrators.
NFR 07.10	M	The help in the period of final portal testing.
NFR 07.11	M	The help during installation and start of portal.
NFR 07.12	M	Remedial action, revealed during acceptance tests of portal.

Stages of implementation of the Portal

Design, development, testing and portal implementation shall be made according to the following diagram:

1. The stage of development of system which shall be divided on under - stages, approved with the Customer as follows:
   a) The developer starts the analysis and development of the unrolled Specification which contains detailing of business processes, this stored in system and also structure given for the exchange with external resources. This document is approved with the Customer. Under - the stage will not exceed these 2 weeks;
   b) The developer will elaborate and present two design variants of the portal from which one will be chosen (a report will be drawn up with the chosen proposal attached). The selected variant of design will include the icon sets for the portal. Under - the stage will not exceed these 2 weeks;

c) Developer starts to develop code and portal integration modules. In parallel, the developer prepares a technical project, consisting of two documents: the SRS and SDD. This sub-phase will not exceed 3 months;
d) The developer starts portal testing and prepares the set of the accompanying documentation. Duration of this stage makes 2 weeks. Procedure of testing shall include obligatory following stages:
   - joint check of all test cases according to all functional requirements in system;
   - on the basis of results of testing, in case of need, necessary adjustments and changes in system will be executed.

2. The stage of filing portal with data will begin after first stage of development of portal. The developer will process and publish on the portal the content provided by the Beneficiary. Duration of this stage will not exceed this 1 month;
3. The stage of training begins along with the stage of filling portal and shall cover training of 2 system administrators and 5 internal users of portal. Duration of this stage makes 2 weeks;
4. The stage of implementation will begin after second stage and provides works of installation of the portal in production environment together Beneficiary's team. Duration of this stage makes 1 week.
5. The stage of support of portal is the period during which the Developer assumes obligations for support of the delivered portal and error correction revealed during this period. Technical support after implementation (after start of system) within 12 months according to the standard ISO / IEC 14764.

KEY DELIVERABLES AND INDICATIVE TIMEFRAME

The selected Contractor is expected to provide the following deliverables according to the schedule below:

Deliverable	Target Date
1. Report No. 1 on analysis and development of the unrolled Specification which contains detailing of business processes, this stored in system and also structure given for the exchange with external resources, approved by the Project Manager	4 weeks after contract signature
2. Report No. 2 on elaboration and presentation of two design variants of the portal from which one will be chosen, approved by the Project Manager	4 weeks after contract signature
3. Report No. 3 on code and portal integration modules development and technical project, consisting of two documents: the SRS and SDD, approved by the Project Manager	3 months since submission of Deliverable 2
4. Report No. 4 on portal testing with accompanying documentation, approved by the Project Manager	2 weeks since submission of Deliverable 3
5. Report No. 5 on processing and publishing on the portal the content provided by the Beneficiary, approved by the Project Manager	1 month since submission of Deliverable 4
6. Report no. 6 Trainings and capacity support for staff approved by the Project Manager.	2 weeks since submission of Deliverable 4

7. Report no. 7 on Requirements to set of delivery according to the table 1.18., approved by the Project Manager	2 weeks since submission of Deliverable 5
8. Report no.8 Maintenance and Technical Support (including description of contributions provided for maintenance and technical support)	12 months since submission of Deliverable 7

Note: The indicated tentative timeframe has been estimated as being sufficient/feasible for the envisaged volume of work to be completed successfully and is proposed as a guideline for the duration of the assignment. The provision of the envisaged deliverables approved by UDNP shall be the only criteria for Contractor's work being completed and eligible for payment/s.

INSTITUTIONAL ARRANGEMENTS

Expected duration of the contract/assignment: The duration of current assignment is May 2022 – May 2024. The deliverables and timeframe are presented in the section above. It is expected the company will allocate the number of experts/days that will be required for the implementation of this contract. In case if the experts will be changed during the implementation process the company should ensure that they meet the criteria for each position indicated in this ToR and timely notification should be sent to the project. The company should submit all deliverables due time and allocating the time for review and feedback from the project implementation team.
UNDP will require maximum of 14 (fourteen) days (depending on the implementation stage) to review the deliverables, provide comments, approve/deny, or certify acceptance of deliverables.

Language for deliverables' submission: The Contractor shall submit Reports according to section above, which highlights the current status of performed activities and main findings, key issues, and preliminary conclusions. The Inception and Progress Reports, including all deliverables should be submitted in Romanian, in electronic version.
All the deliverables and reports must be endorsed by the UNDP and the final beneficiaries. All activities under this assignment shall be performed in a gender-sensitive manner, with respect of blue /green principles and applying human rights-based approach.

Key Performance Indicators and Service Level: All deliverables presented by the Company should be in accordance with the requirements stated in ToR, be written in a clear and concise language. References for the data sources should be provided, and no plagiarism is acceptable in the text. The employer reserves the right to return the documents and give the deadline for addressing identified irregularities.

Governance and Accountability: The contractor will work under the direct supervision of the NAP-2 Project Manager, and NAP-2 Team Leader. The contractor shall take overall responsibility on the quality and timeliness of project implementation process within its competency. All deliverables shall be coordinated with the beneficiaries.

Facilities and costs of the assignment: All services that are a part of the current ToR and proposed methodology by the contractor are a solely responsibility of the subcontractor. All costs, including travels, logistics, translation, bank fees, taxes etc. should be included into the financial offer. UNDP shall not accept any additional expenses which were not included in the company's financial offer unless UNDP revises the scope work during the contract implementation within allowable margins.

COVID-19 implications: The selected contractor shall abide by the latest recommendations of WHO and National Commission for Emergency Situations of the Republic of Moldova pertaining to safety measures in the COVID-19 context. The Offeror's proposal shall be clear on the activities, costs entailed, and approach proposed to ensure the delivery of the assignment in the current pandemic context whereby objectives of the assignment are met, while enforced safety standards are adhered to.
Shall it be feasible to conduct any meetings, or any other activities under the assignment with physical presence of participants, the contractor will abide by the safety rules and regulations set by the Moldovan authorities in regard to gatherings/meetings at that particular time.

PAYMENT

The payment for services will be made in tranches upon submission of deliverables stated in deliverable table. All deliverables shall be endorsed by the Project Manager within 14 calendar days from their submission.

Deliverable	Target Date
1. Report No. 1 on analysis and development of the unrolled Specification which contains detailing of business processes, this stored in system and also structure given for the exchange with external resources, approved by the Project Manager	10%
2. Report No. 2 on elaboration and presentation of two design variants of the portal from which one will be chosen, approved by the Project Manager	
3. Report No. 3 on code and portal integration modules development and technical project, consisting of two documents: the SRS and SDD, approved by the Project Manager	40%
4. Report No. 4 on portal testing with accompanying documentation, approved by the Project Manager	
5. Report No. 5 on processing and publishing on the portal the content provided by the Beneficiary, approved by the Project Manager	20%
6. Report no. 6 Trainings and capacity support for staff approved by the Project Manager.	
7. Report no. 7 on Requirements to set of delivery according to the table 1.18., approved by the Project Manager	15%
8. Report no.8 Maintenance and Technical Support (including description of contributions provided for maintenance and technical support)	15%

QUALIFICATIONS AND SKILLS REQUIRED

The selected Company/Organization should:

- Be legally registered entity or consortium of companies/organizations where each member of legally registered;
- Minimum 5 (five) years of relevant experience in developing IT systems;
- At least 3 (three) IT projects of similar complexity, developed in the past 5 (five) years and their brief description;
- Experience of integration of Application Interface of government e-services, will be a strong advantage;

- Demonstrated experience of working with Central Public Authorities will be a strong advantage;
- Working experience with UN Agencies and/or other international organizations will be an asset.

Composition and requirements for the Team of experts

The bidder should propose the team of experts which will be involved into the implementation of the current assignment as per the positions indicated below.

Project Manager

- University degree in Management, Engineering, ICT, or another relevant field
- At least 5 (five) years of experience in project management of projects on developing IT applications/systems, services, etc.
- Experience in a similar position in at least 2 (two) similar projects
- Proved certification in Project Management (Prince, PMI, etc.) would be an asset
- Proficiency in Romanian and English languages

Senior Developer

- University degree in Engineering, ICT or another relevant field
- At least 5 (five) years of experience in the proposed position
- Experience in a similar position in at least 3 (three) similar projects
- Experience in the development of IT application with GIS's component would be a strong advantage
- Demonstrated experience in technologies related to the portal and GIS component development platform (e.g. PHP, Java, jQuery, Python) would be an advantage
- Proficiency in Romanian language

Developer

- University degree in Engineering, ICT or another relevant field
- Experience in a similar position in at least 2 (two) similar projects
- At least 3 (three) years of experience in the proposed position
- Demonstrated experience in technologies related to the portal and GIS component development platform (e.g. PHP, Java, jQuery, Python) would be an advantage
- Proficiency in Romanian language

Tester

- University degree in Engineering, ICT or another relevant field
- Experience in a similar position in at least 2 (two) similar projects
- Demonstrated experience in technologies related to the portal and GIS component development platform (e.g. PHP, Java, jQuery, Python) would be an advantage
- Proficiency in Romanian language

Designer

- University degree in Designing or another relevant field. Additional certificates/trainings in designing and other related areas will be a strong asset
- Demonstrated development skill in UI /UX design
- At least 2 (two) years of experience in the proposed position. Experience demonstrated through the portfolio of works executed
- Proficiency in Romanian language

The applicant should present the CVs of each team member, individually signed, that allow to identify the

roles and responsibilities for the process. Each CV should clearly state:

- Contact information and main data about the person;
- Role in the project and level of involvement;
- Information on education (formal and courses/trainings);
- Previous experience relevant to the assignment;
- Contact information (name, title, organization, mailing address, phone, and email) for a minimum
- of three business references;
- Linguistic and other skills.

The competencies and skills of the above-listed key-personnel will be evaluated as per Section 4. Technical Evaluation Criteria Form. The Company could consider other non-key personnel that is required for the successful implementation of the present assignment; however, their competencies will not be evaluated. The Company should demonstrate substantial human resource capacity, proportionate to the workload to mitigate negative effects on the pace of implementation.
The Company shall take all reasonable measures necessary to ensure that the personnel deployed under this assignment shall respect local customs and conform to the highest standards of moral and ethical conduct and adherence to UNDP values (human rights, gender equality, respecting differences of culture, gender, religion, ethnicity, nationality, language, age, HIV status, disability, and sexual orientation, or other status). UNDP may at any time request the withdrawal or replacement of any of the key-personnel if these standards are not adhered to. Replacement will be made at the Company expense.

The company shall ensure no substitution of the team of experts during the implementation of this assignment prior to the written approval from the NAP-2 Project Manager. In case substitution occurs, the company shall ensure that all required qualifications for this assignment remain available within the expert's team.

APPLICATION

Interested entities must submit a technical and price offer containing:

- Detailed description of the enterprise (experience, human resources, managerial and technical capacities, etc.);
- Copies of the registration documents;
- The company's portfolio with the indication of similar implemented projects;
- References of the company's beneficiaries for the last 3 years;
- CVs of the key staff involved in the project;
- Description of the non-key staff involved in the project;
- Brief description of similar IT solutions;
- The proposed detailed technical offer, including description of functional and non-functional requirements, hardware operating restrictions, estimated activities and their duration;
- Methodology for providing warranty, maintenance and support services (including owned facilities);
- Detailed financial offer.

Annexes

Annex 1 – Structure of Portal

News	
	Events
	Calls for proposals projects
	Climate Change Jobs, Education, Opportunities in Moldova
Weather forecast	
	Weather Forecast
	Agricultural Forecast
	Satellite and Radar data
	Hazard Warning
Climate Change	
	Global Climate Change
	Climate Change in Moldova
	Climate Change Mitigation
	Climate Change Adaptation
	DRR
	NCCC
	Monitoring and Evaluation
Hazards	
	Overview
	Floods
	Droughts
	Windstorms
	Frosts
	Hailstorms
	Wildfires
	Heatwaves
Sector	
	Overview
	Agriculture
	Energy
	Transport
	Health

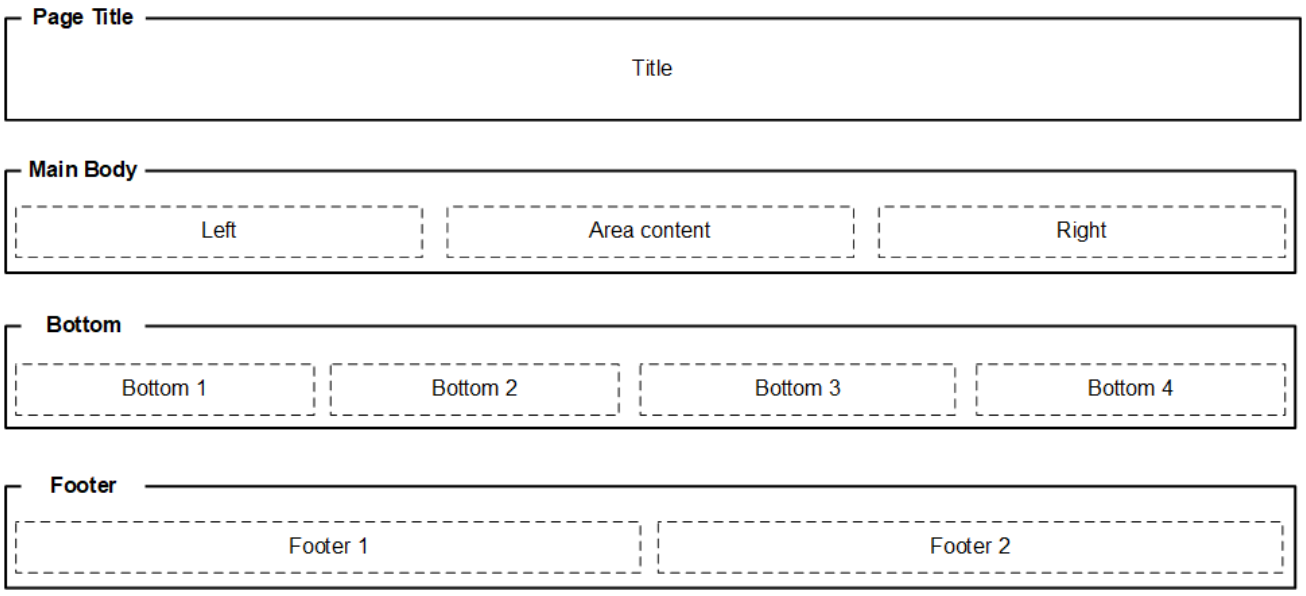
	Water resources
	Forestry and Biodiversity
	Infrastructure and Buildings
	Urban
	Disaster management
	Insurance
Regions	
	Country level
	Districts
	Municipalities
Tools and resources	
	Policies and plans
	Adaptation planning support tools
	Moldova Climate Data Tool (MCDT)
	Moldova Climate GIS
	Climate Services
	Finance and investments
	Education and awareness
	Case studies
About the Platform	
	To use information
	Provide information
	Glossary & Library
	Data policy
	Contacts

Annex 2 – List of data providers

Portal section	Name of dataset	Provider	Method of delivery
Weather forecast			
	Weather Forecast	SHS	widget
	Agricultural Forecast	SHS	widget
	Satellite and Radar data	SHS	widget
	Hazard Warning	SHS	widget
Moldova Climate Data Tool (MCDT)			
	Upper Atmosphere	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Surface Atmosphere	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Atmospheric composition	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Hydrosphere	SHS, Apele Moldovei	Layer for Interactive maps (GIS) via web-services or file to import
	Biosphere and Land Cover	Ministry of Agriculture, Environment Agency	Layer for Interactive maps (GIS) via web-services or file to import
	Soil	Ministry of Agriculture, Environment Agency	Layer for Interactive maps (GIS) via web-services or file to import
	Agriculture	SHS, Ministry of Agriculture	Layer for Interactive maps (GIS) via web-services or file to import
	Antroposphere	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Individual pages for indicators of MCT	SHS	from imported layers
Moldova Climate GIS			
	Surface temperature (mean and extremes)	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Precipitation (mean and extremes)	SHS	Layer for Interactive maps (GIS) via web-services or file to import

Portal section	Name of dataset	Provider	Method of delivery
	Wind Speed and Direction	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Solar radiation	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Evapotransporation from land	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	River discharge (annual, seasonal)	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Land Cover structure	Environment Agency	Layer for Interactive maps (GIS) via web-services or file to import
	Sum of active temperatures	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Aridity index	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Index of Biological Effectiveness of Climate (IBEC)	SHS	Layer for Interactive maps (GIS) via web-services or file to import
	Hydrothermal coefficient (HTC) indexed for vegetation period	SHS	Layer for Interactive maps (GIS) via web-services or file to import

Annex 3 - General template layout for Portal



Annex 4 - List of climate indicators for "Moldova Climate Data Tool (MCDT)"

Name of Indicator
Upper Atmosphere
Upper air atmosphere temperature
Upper Air Wind Speed and Direction
Upper Air Atmosphere Water Vapour
Sunshine duration
Lighting
Clouds
Surface Atmosphere
Surface Air temperature (mean and extremes)
Surface Wind Speed and Direction
Surface water vapour (humidity)
Surface Atmospheric Pressure
Surface Radiation budget / Solar radiation
Precipitation (mean and extremes)
Present and past weather
Visibility
Atmospheric Composition
Carbon dioxide
Methane
Other green house gases
Ozone
Aerosols
Precursors for Aerosole and Ozone
Hydrosphere
Snow depth
Snow-water equivalent
Evaporation from land
River discharge (annual, seasonal)
Groundwater indicators
Lake ecosystem indicators
Other available indicator on water ecosystems (river, lakes, etc.)
Biosphere and Land Cover
Land Cover structure
Albedo
Land Surface Temperature
Above-ground biomass
Invasive species
Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)
Other biodiversity indicators
Soil
Soil Temperatures
Soil Moisture

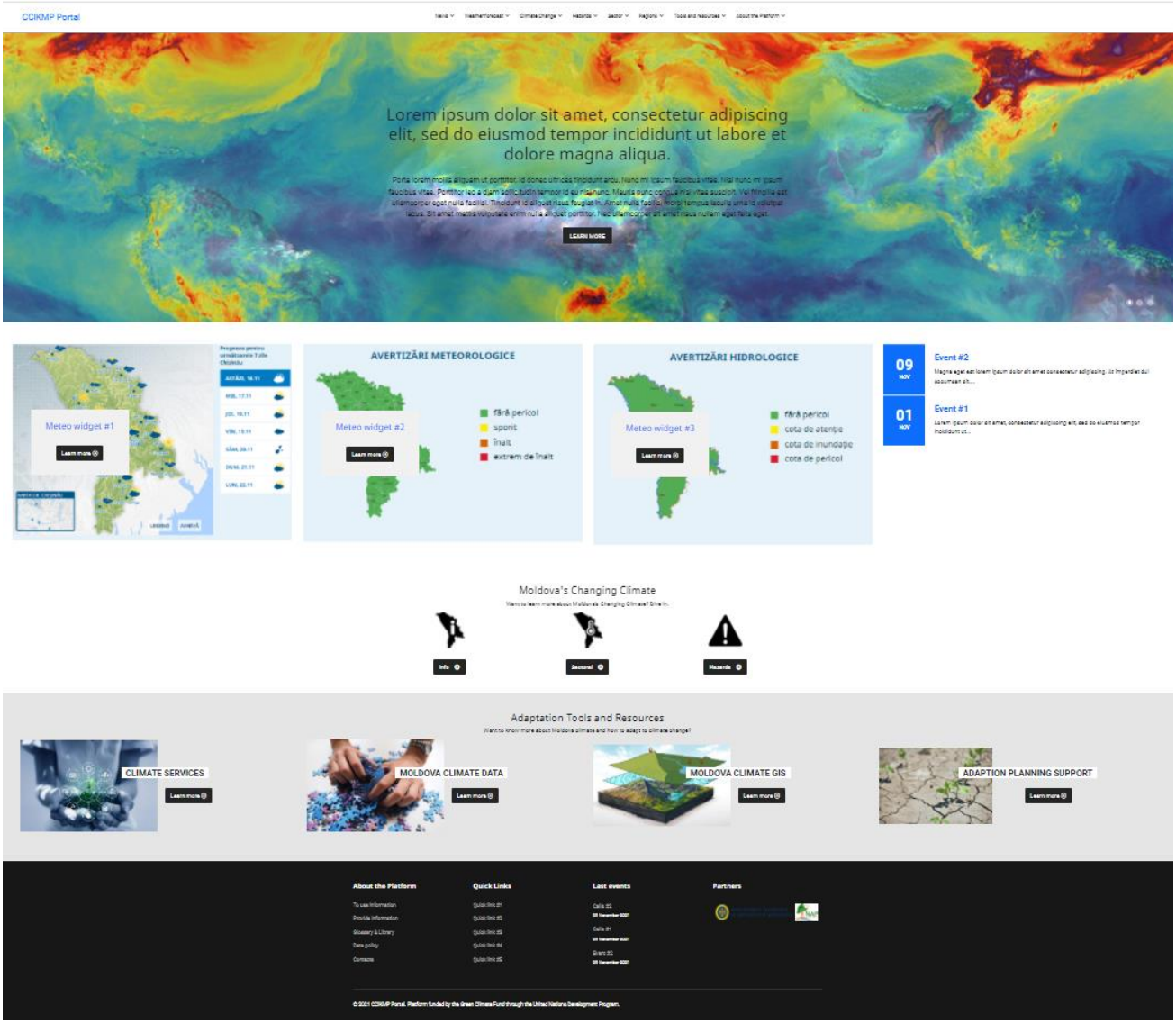
Name of Indicator
Depth of ground freeze
Depth of ground thaw,
Thickness and density of the snow layer on the farmlands in the winter season
Soil Carbon
Agriculture
Sum of active temperatures
Hydrothermal coefficient
Development phases of the crops (phenology)
Crops state
Crops state during the cold season
Damage of sowings due to unfavourable meteorological phenomena, agricultural pests and diseases
Damage to agricultural crops in winter and during the growing season
General visual estimation of the crops vegetation state
Quantitative estimation of the crops vegetation state
Visual assessment of the state of crops
Crop Pests
Antroposphere
Anthropogenic GHG emission
Anthropogenic Water Use

Annex 5 - List of climate indicators for "Moldova Climate GIS"

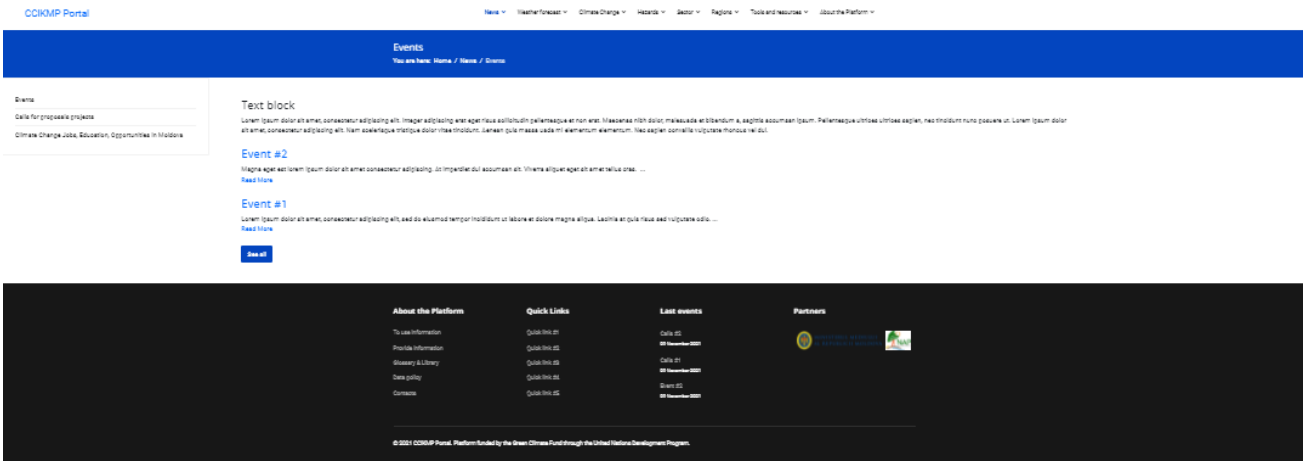
Name of Indicator
Surface temperature (mean and extremes)
Precipitation (mean and extremes)
Wind Speed and Direction
Solar radiation
Evapotransporation from land
River discharge (annual, seasonal)
Land Cover structure
Sum of active temperatures
Aridity index
Index of Biological Effectiveness of Climate (IBEC
Hydrothermal coefficient (HTC) indexed for vegetation period

Annex 6 - Mockups of Portals pages

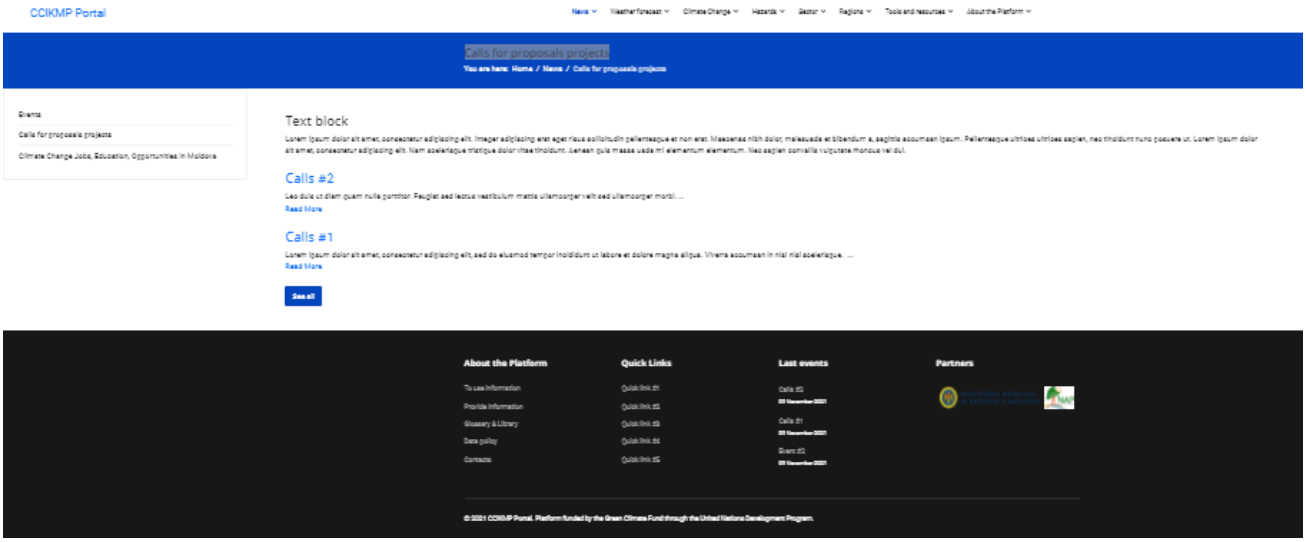
Draft mockup for page "Home"



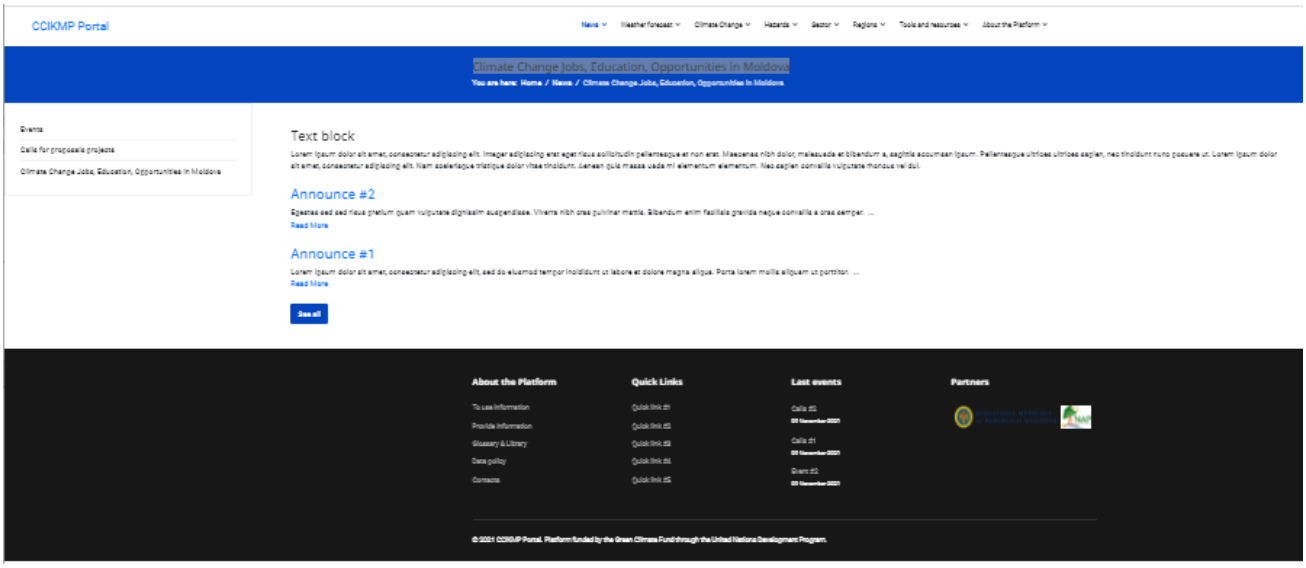
Draft mockup for page "Events"



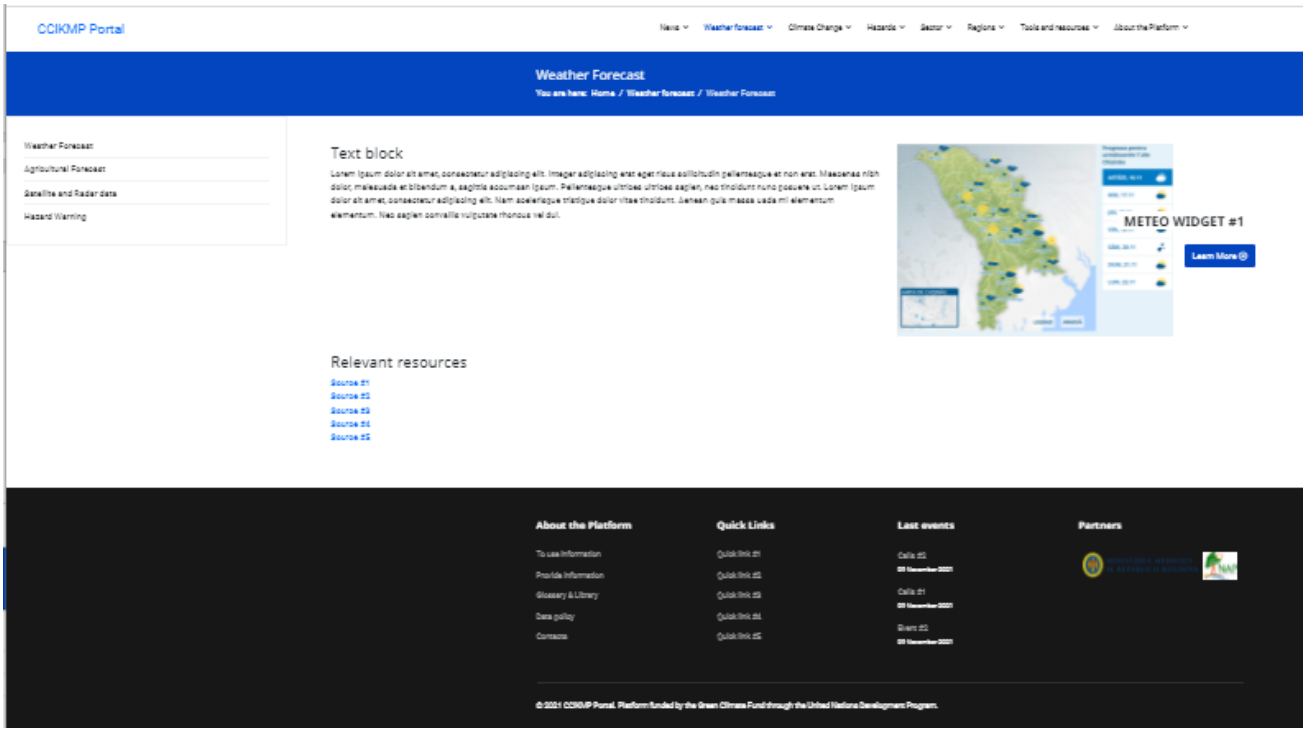
Draft mockup for page "Calls for proposals projects"



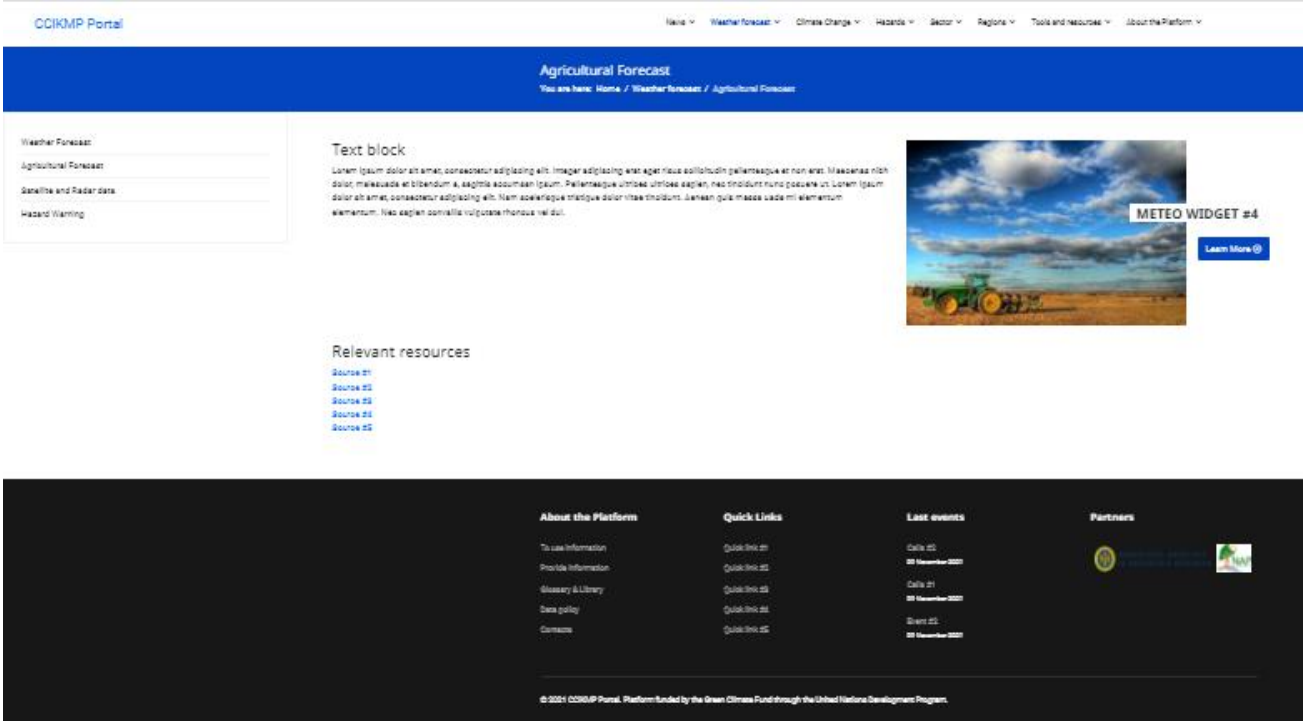
Draft mockup for page "Climate Change Jobs, Education, Opportunities in Moldova"



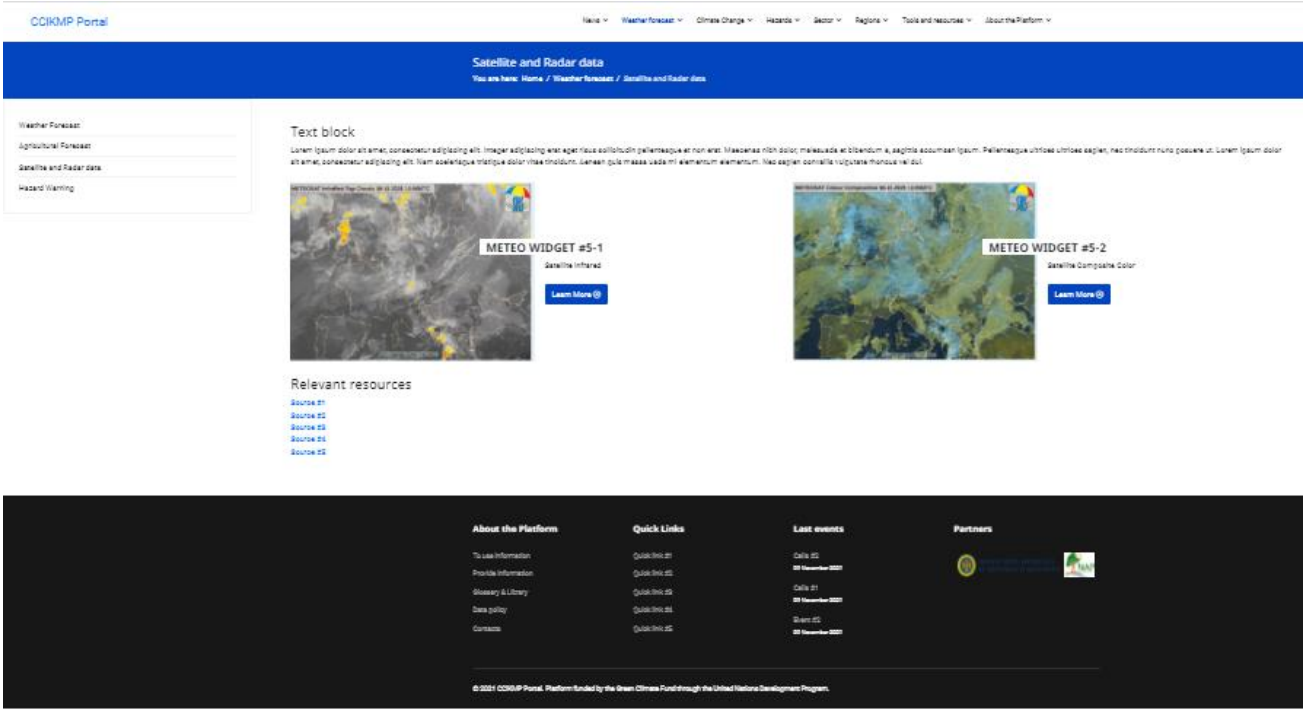
Draft mockup for page "Weather Forecast"



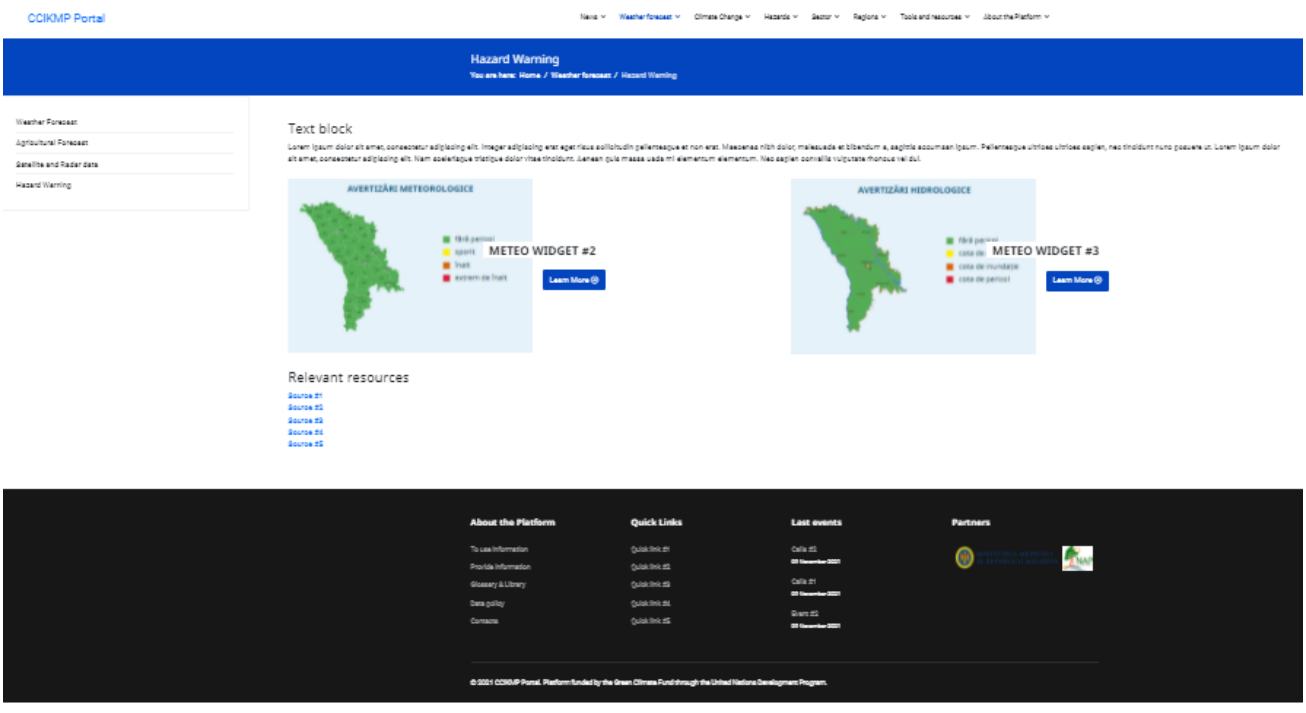
Draft mockup for page "Agricultural Forecast"



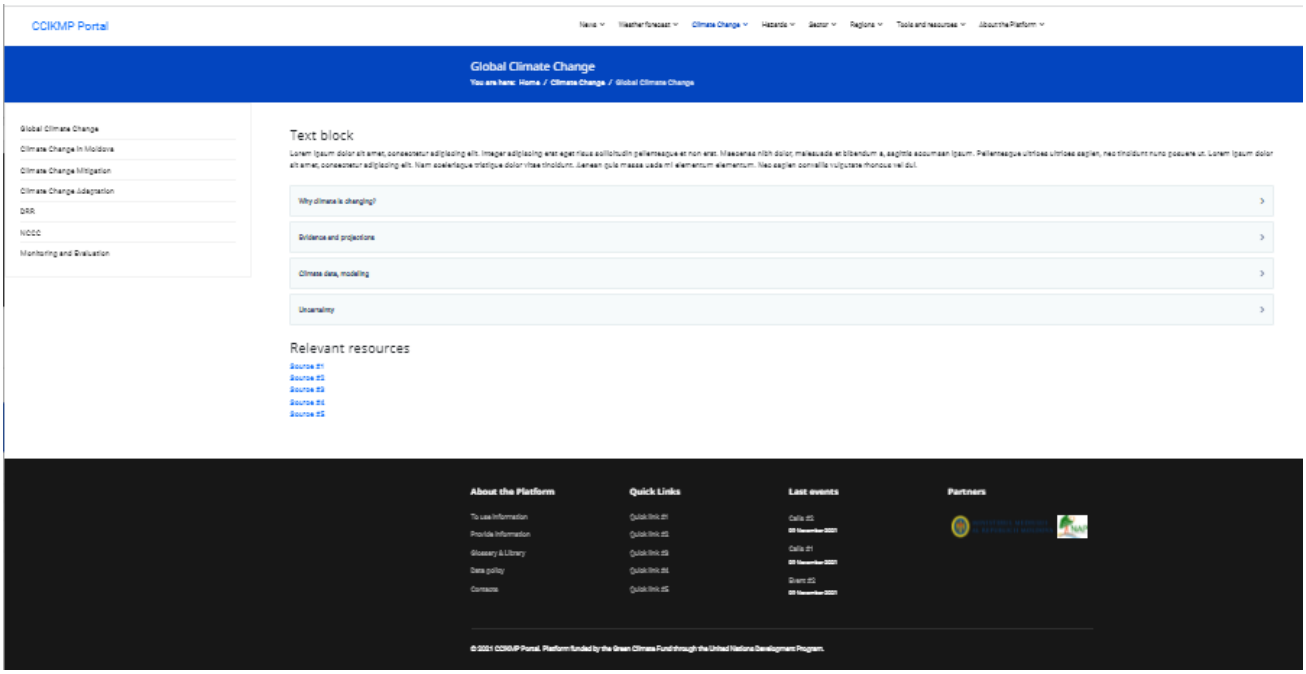
Draft mockup for page "Satellite and Radar data"



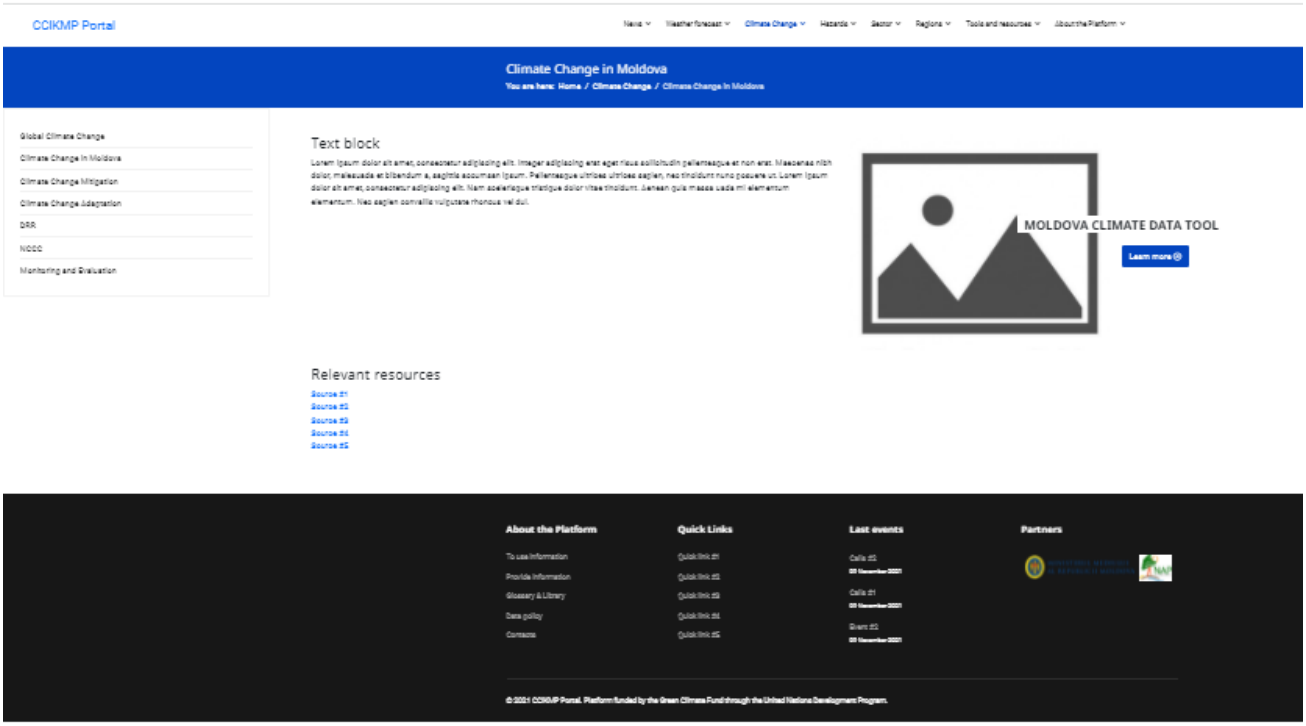
Draft mockup for page "Hazard Warning"



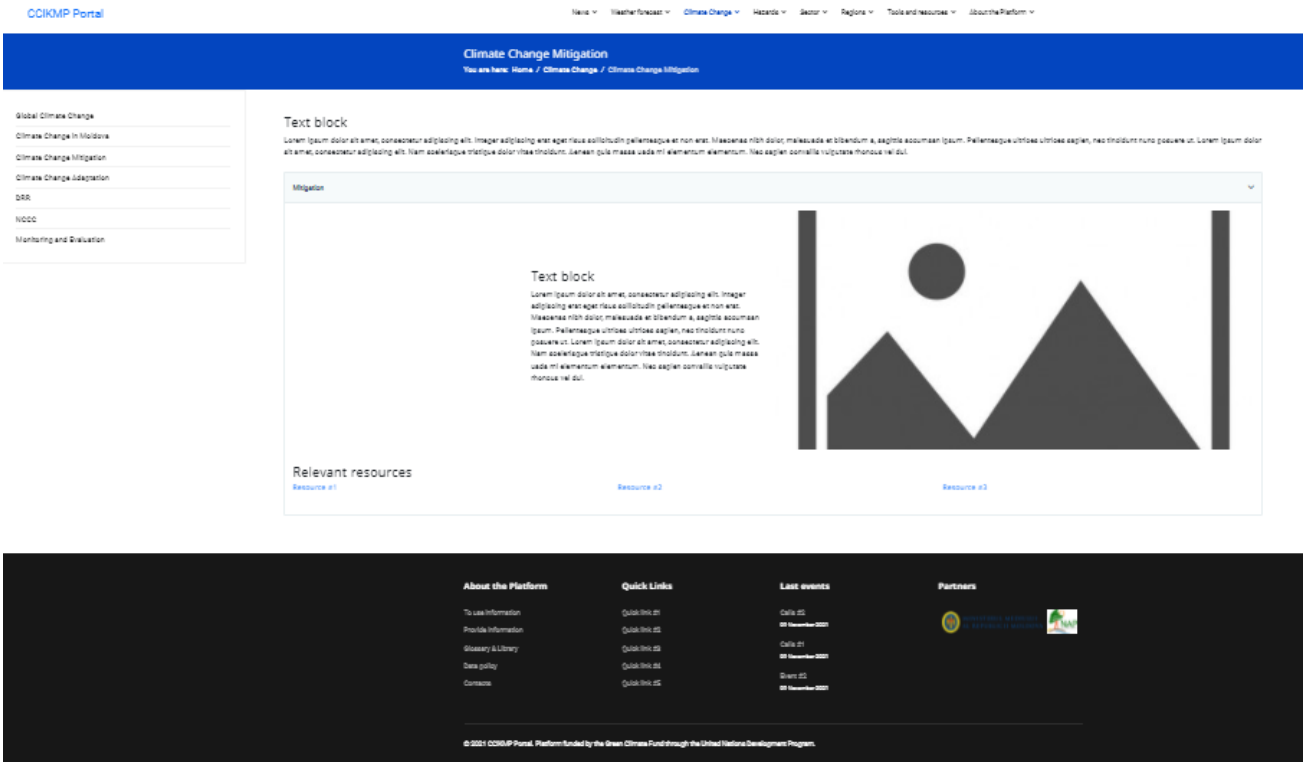
Draft mockup for page "Global Climate Change"



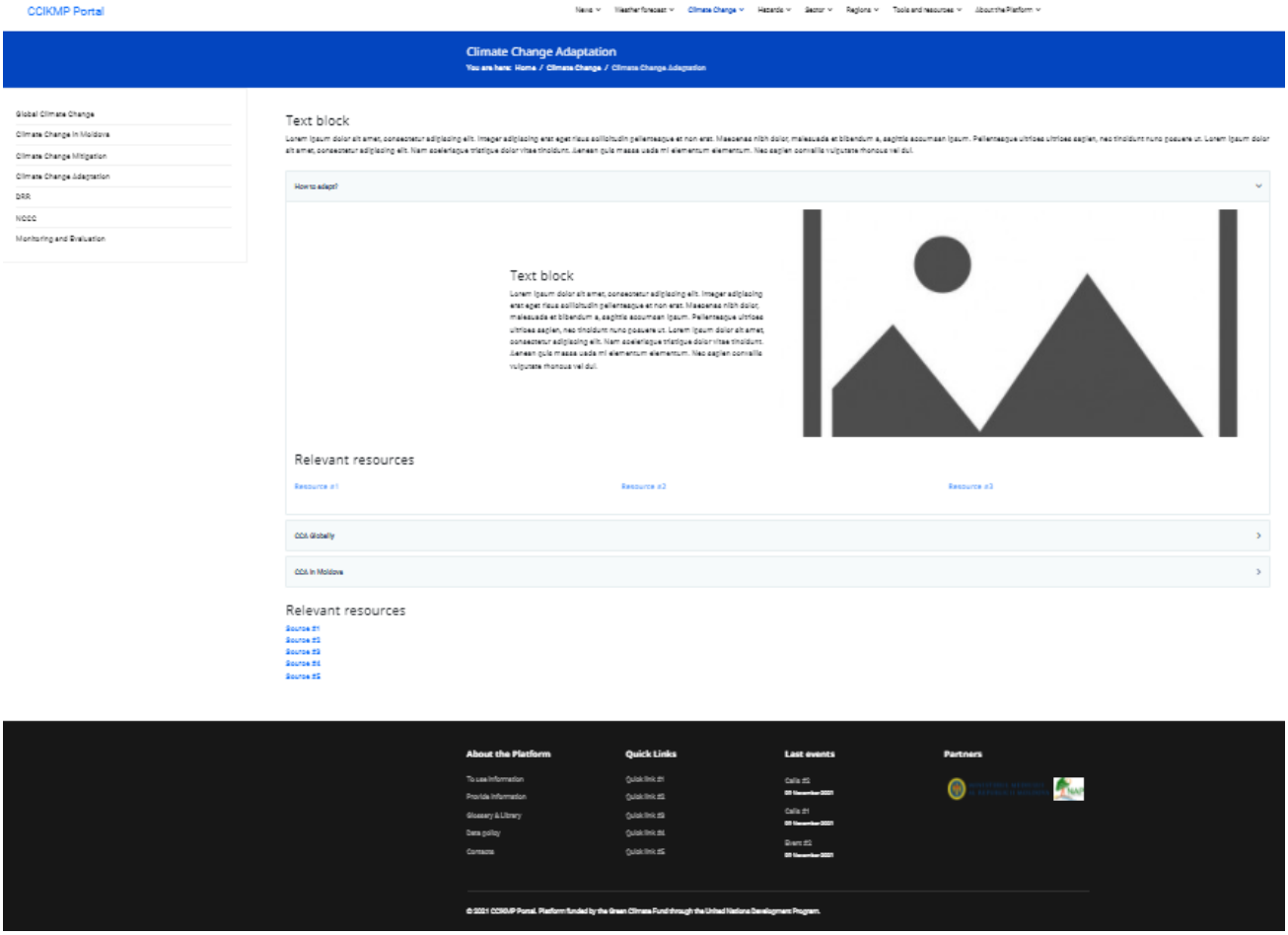
Draft mockup for page "Climate Change in Moldova"



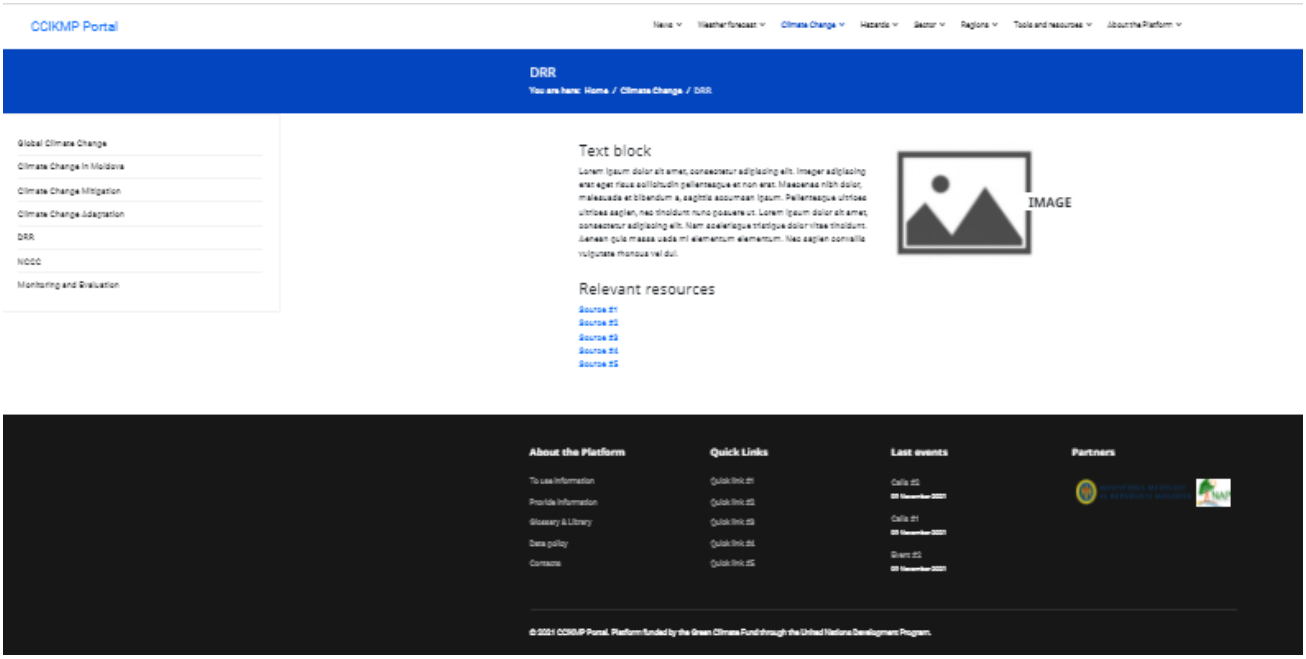
Draft mockup for page "Climate Change Mitigation"



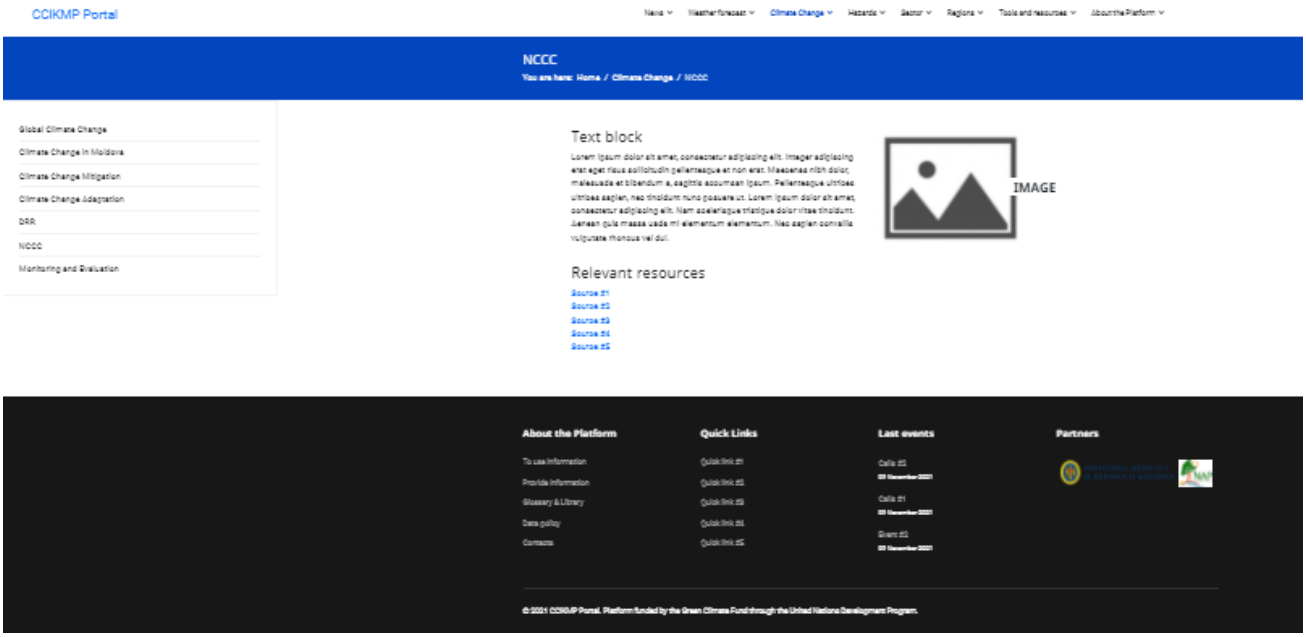
Draft mockup for page "Climate Change Adaptation"



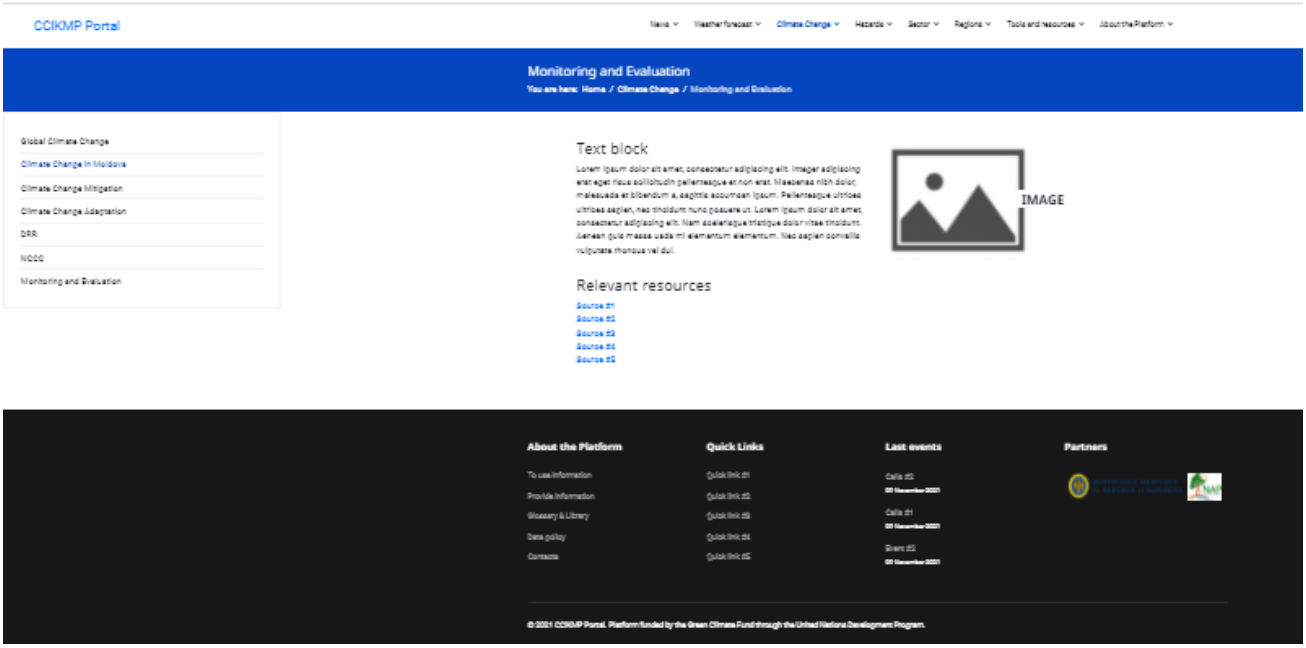
Draft mockup for page "DRR"



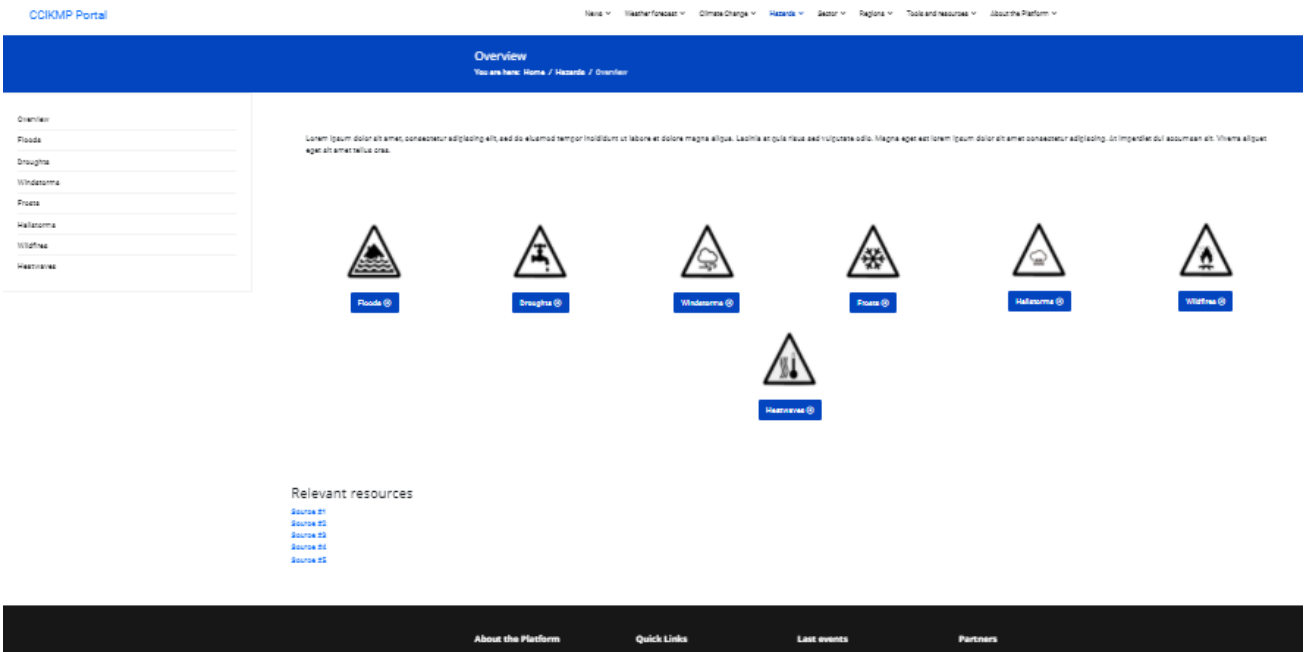
Draft mockup for page "NCCC"



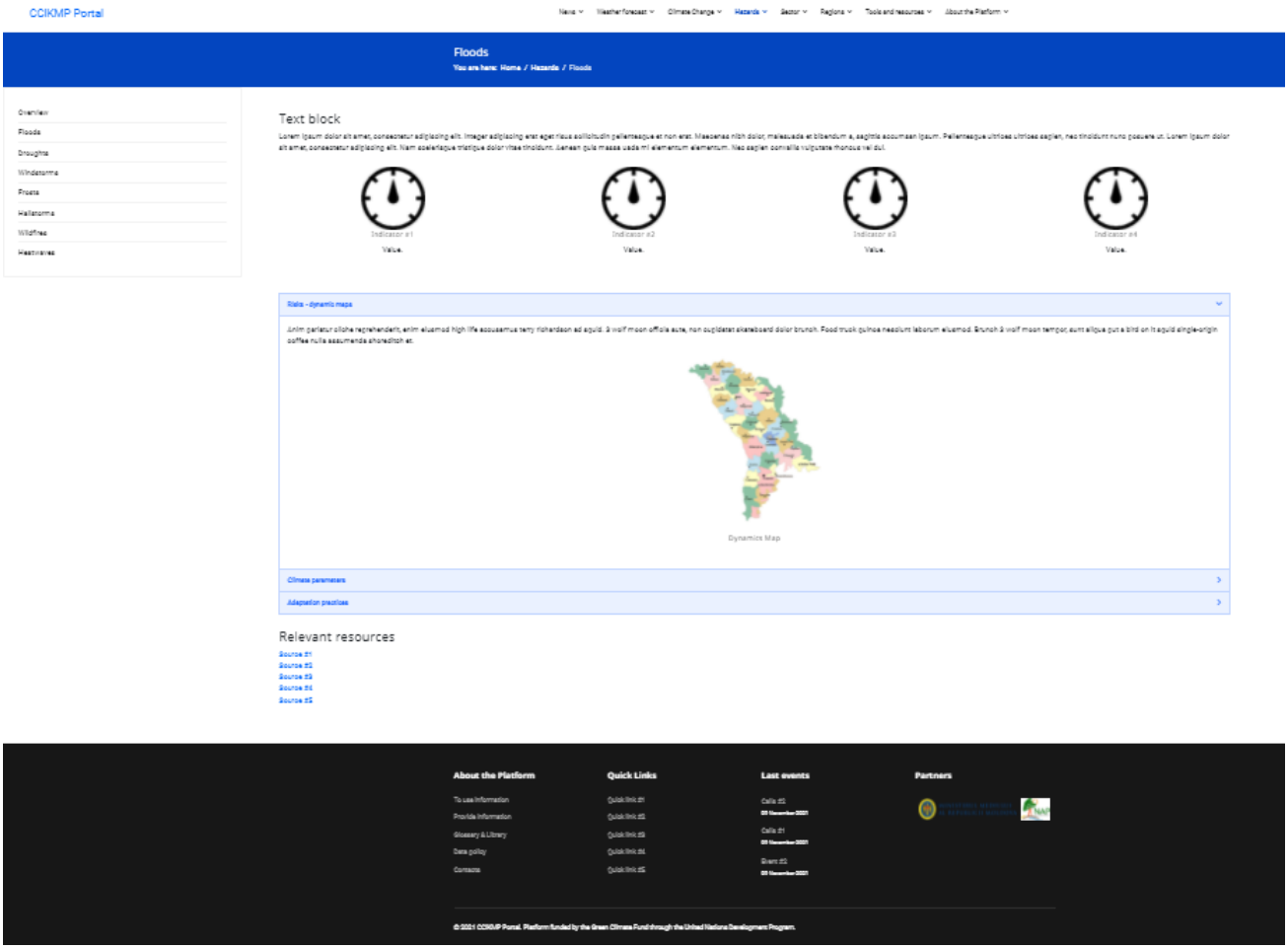
Draft mockup for page "Monitoring and Evaluation"



Draft mockup for page "Hazards - Overview"



Draft mockup for pages "Floods", "Droughts", "Windstorms", "Frosts", "Hailstorms", "Wildfires", "Heatwaves"



Risks - dynamic maps

Climate parameters

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Parameter #1

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Parameter #2

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Parameter #3

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Adaptation practices

Risks - dynamic maps

Climate parameters

Adaptation practices

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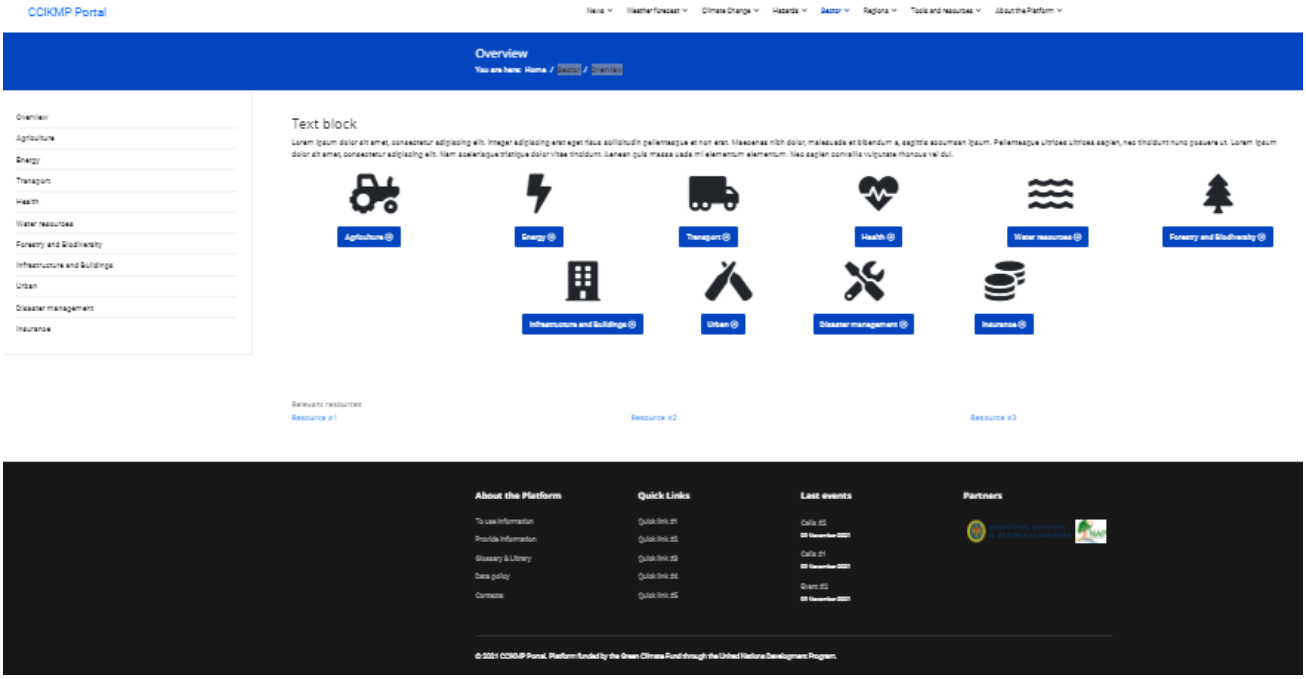
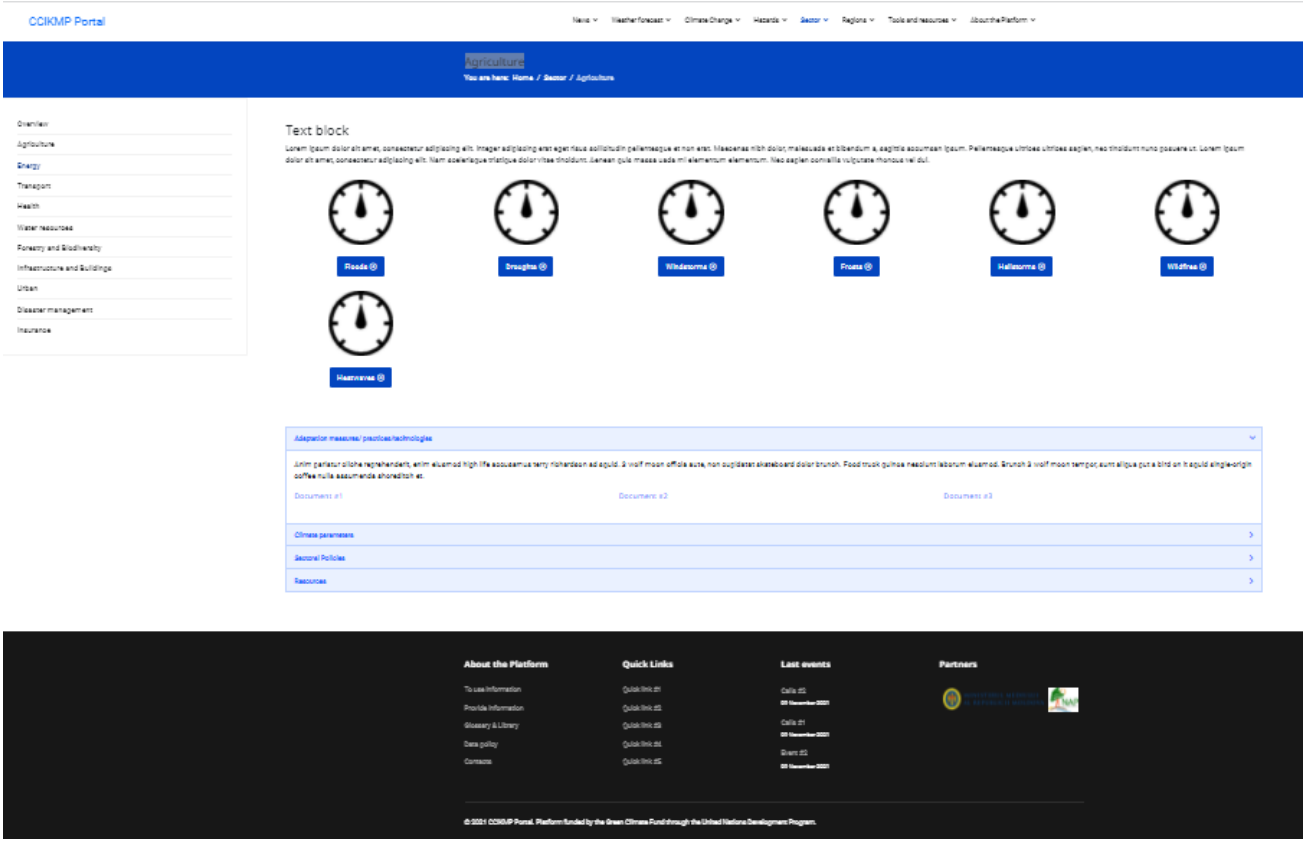
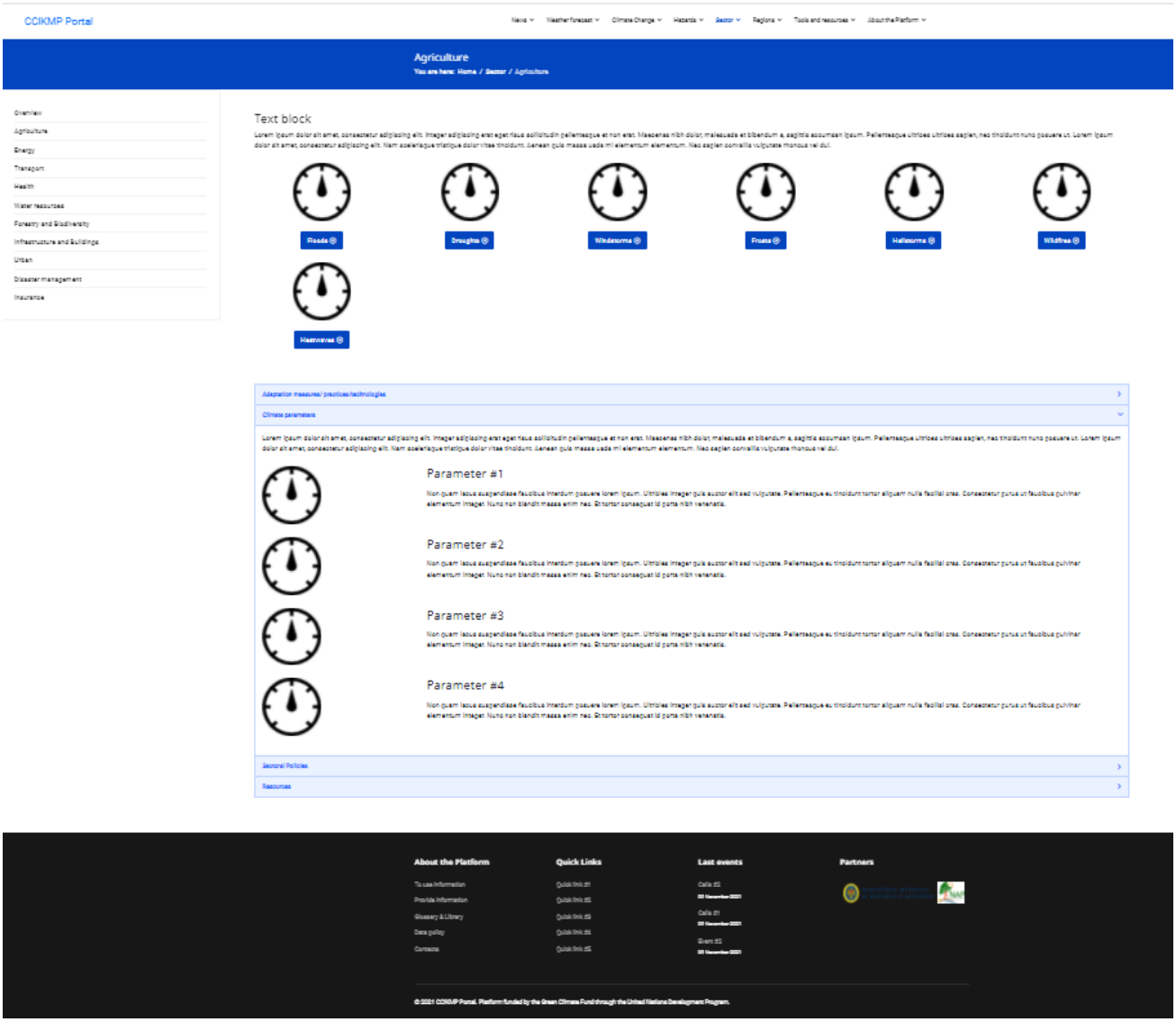
Case studies #1 Case studies #2 Case studies #3

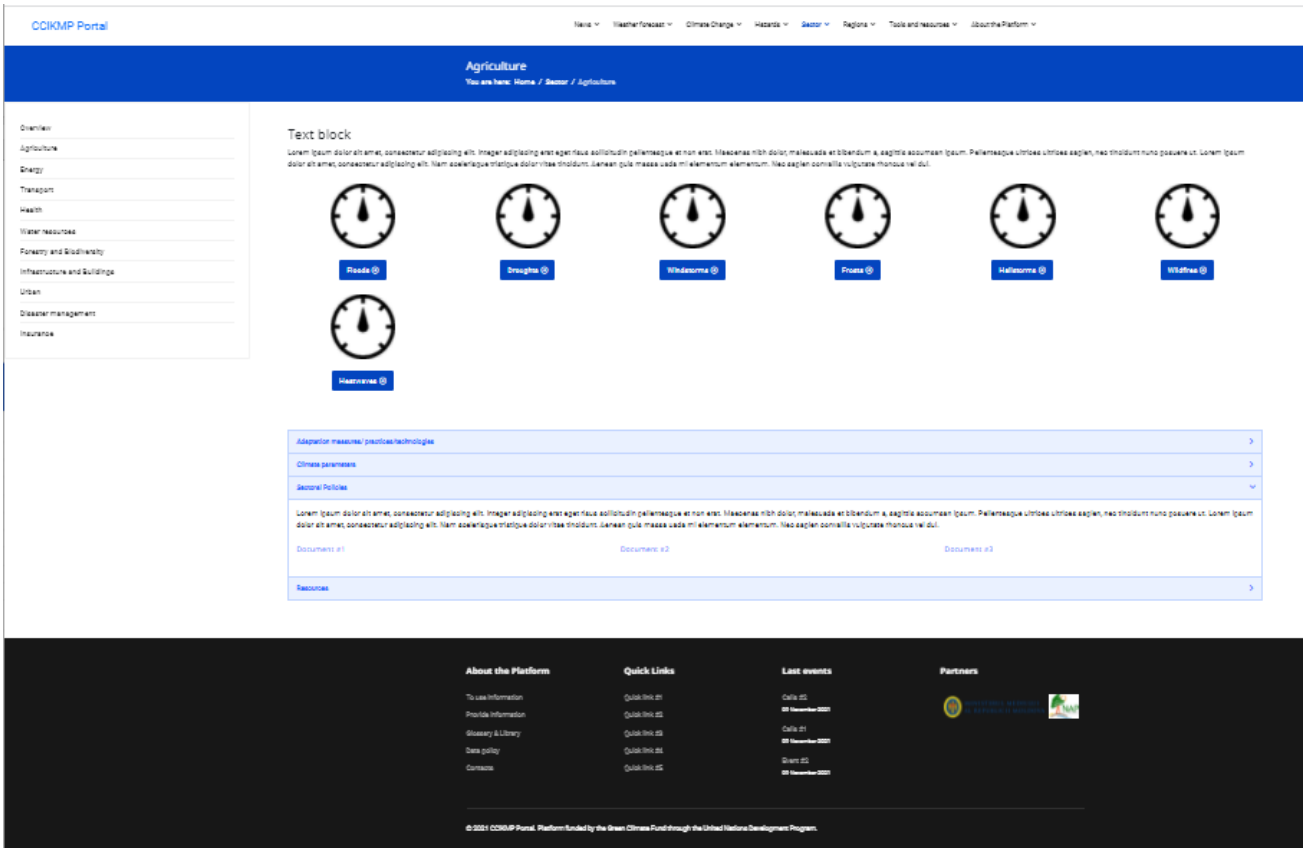
Draft mockup for page " Sector - Overview"

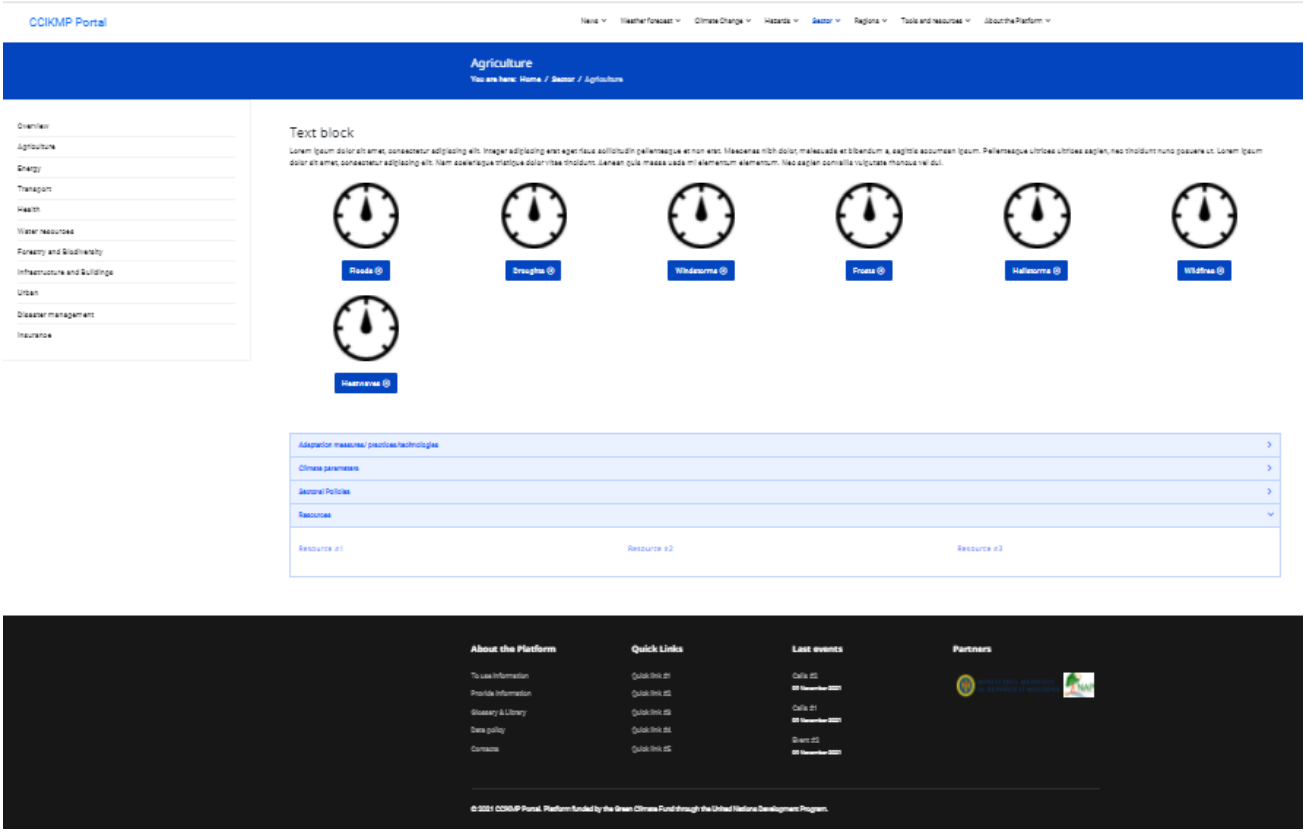


Draft mockup for page "Agriculture"

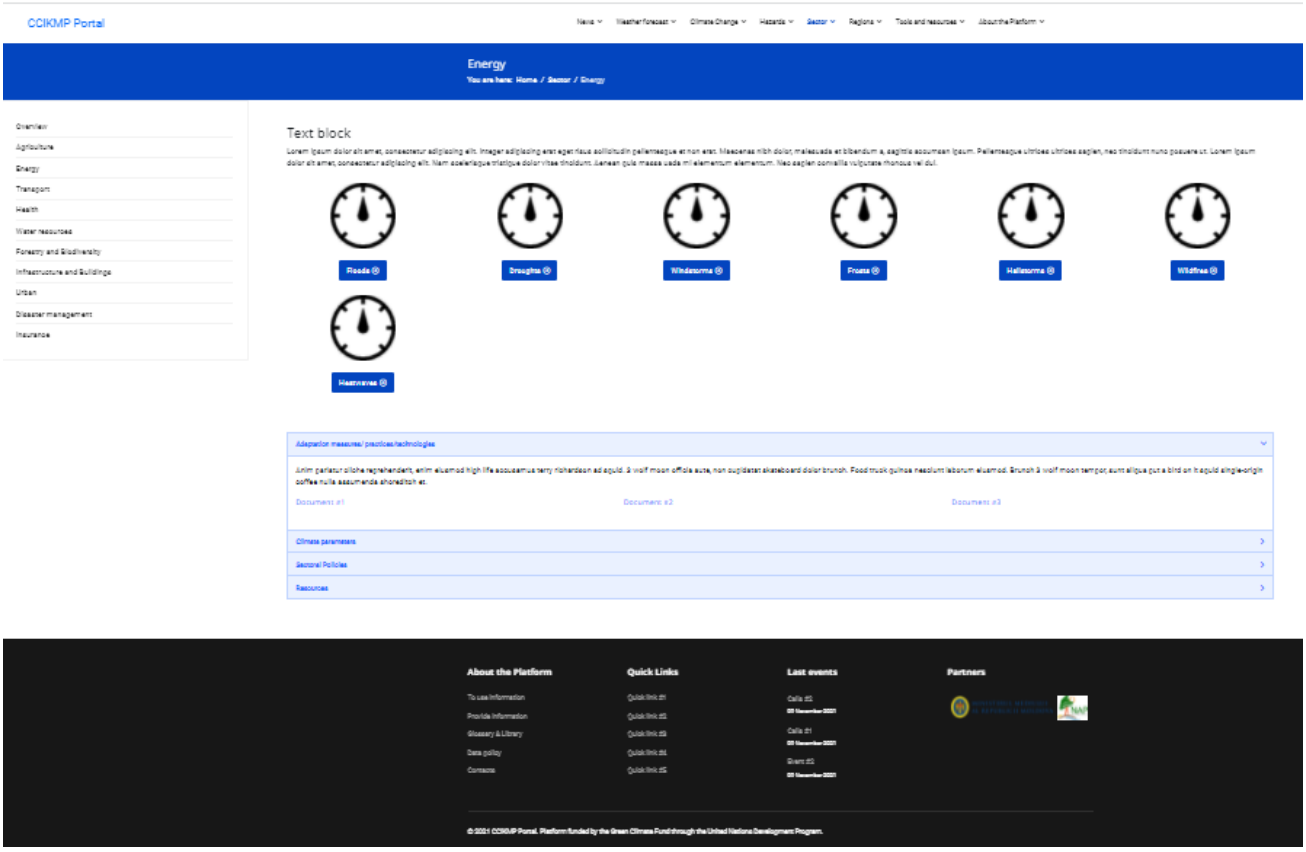



CCIKMP Portal
News
Weather forecast
Climate Change
Hazards
Sector
Regions
Tools and resources
About the Platform
Agriculture
You are here: Home / Sector / Agriculture
Overview
Agriculture
Energy
Transport
Health
Water resources
Forestry and Biodiversity
Infrastructure and Building
Urban
Disaster management
Insurance
Text block
Floods
Droughts
Windstorms
Frosts
Hailstorms
Wildfires
Heatwaves
Adaptation measures/ practices/technologies
Climate parameters
Parameter #1
Parameter #2
Parameter #3
Parameter #4
Sectoral Policies
Resources
About the Platform
To use Information
Provide Information
Glossary & Library
Data policy
Contacts
Quick Links
Last events
Partners


CCIKMP Portal
Agriculture
Text block
Floods
Droughts
Windstorms
Frosts
Hailstorms
Wildfires
Heatwaves
About the Platform
Quick Links
Last events
Partners


CCIKMP Portal
Agriculture
Text block
Floods
Droughts
Windstorms
Frosts
Hailstorms
Wildfires
Heatwaves
About the Platform
Quick Links
Last events
Partners

Draft mockup for page "Energy"



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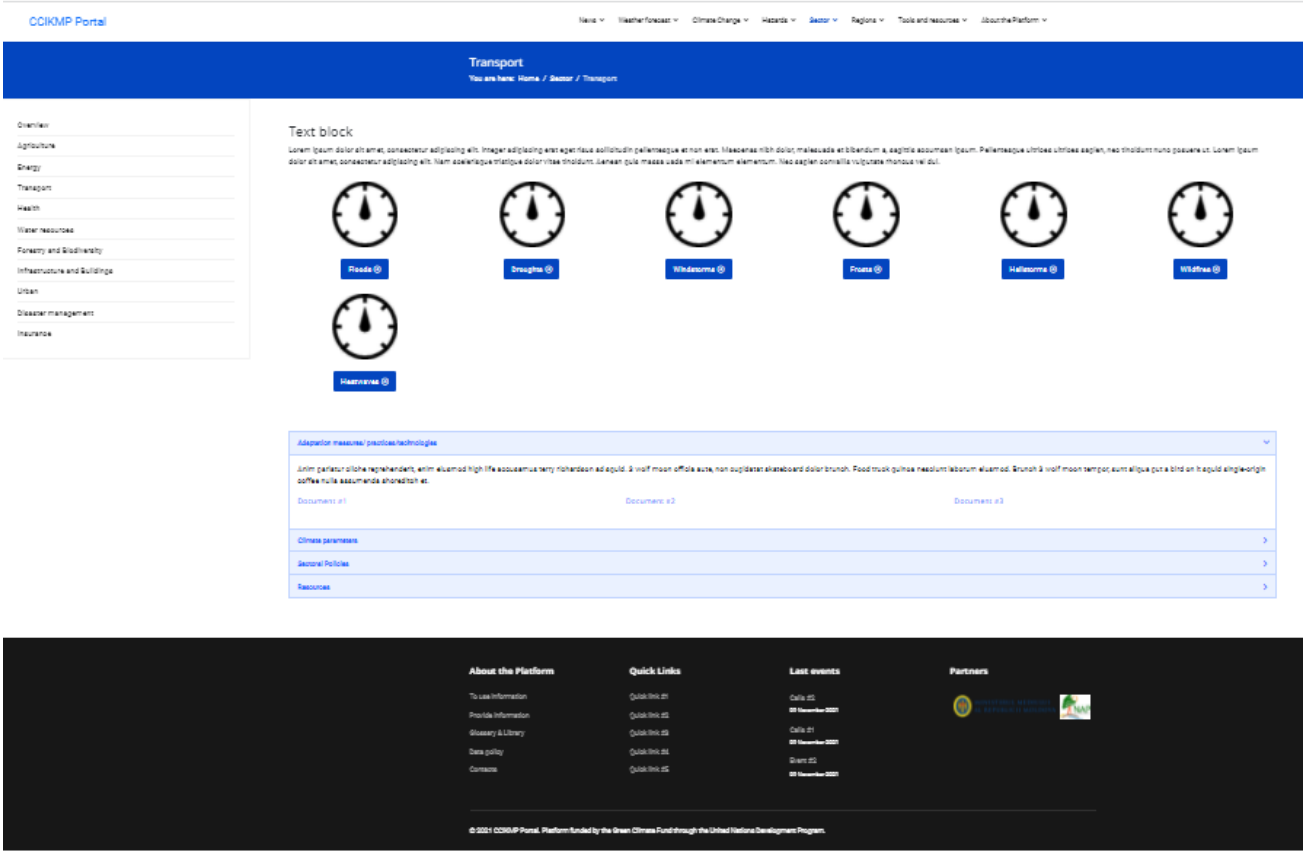

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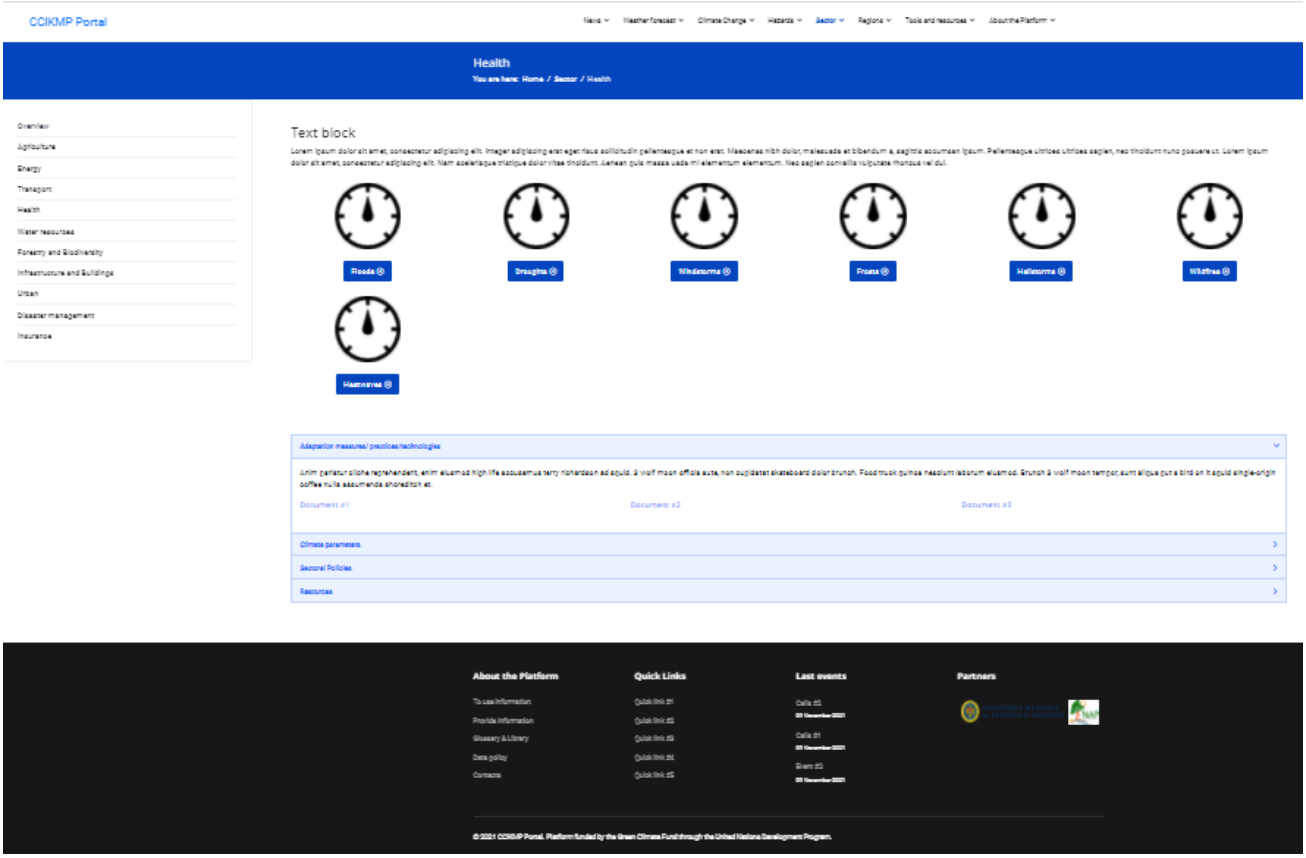
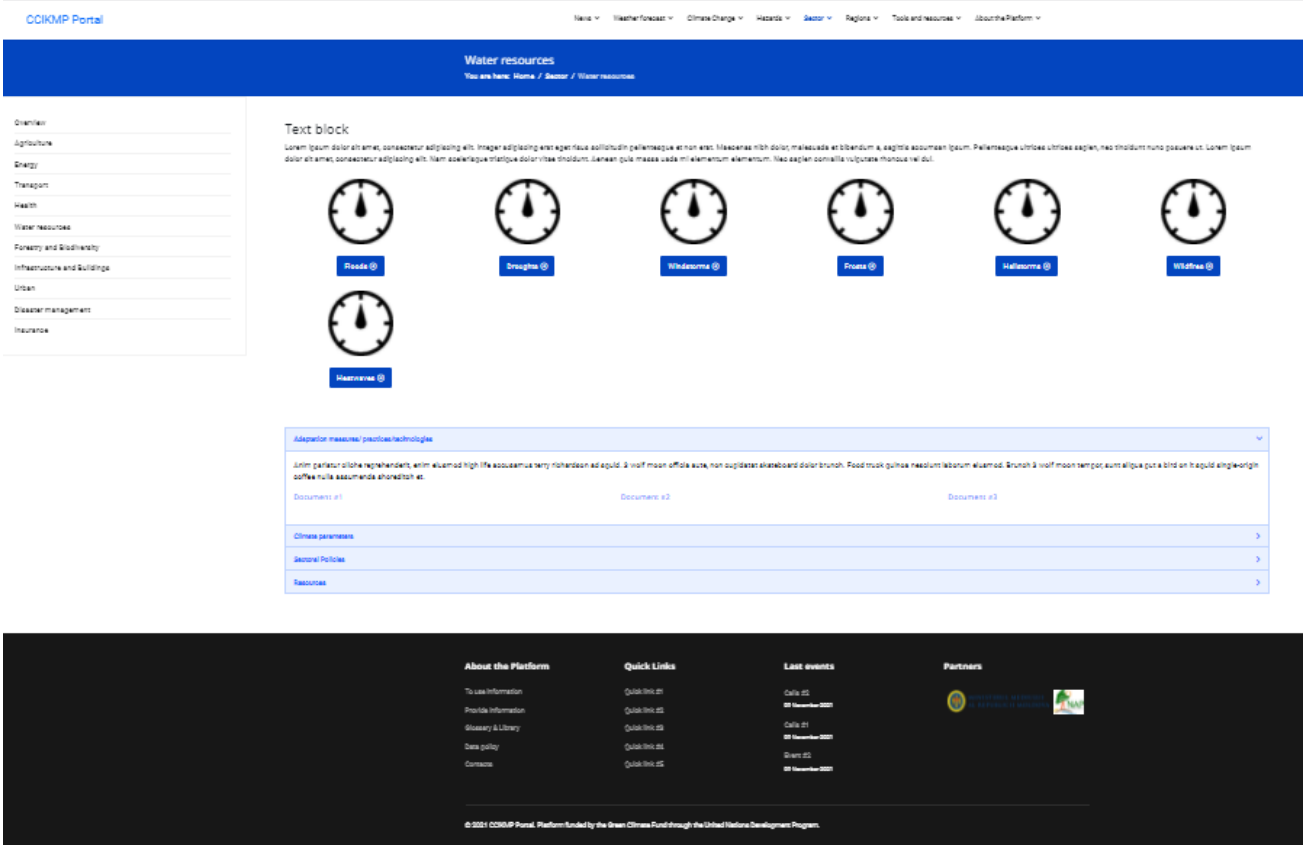
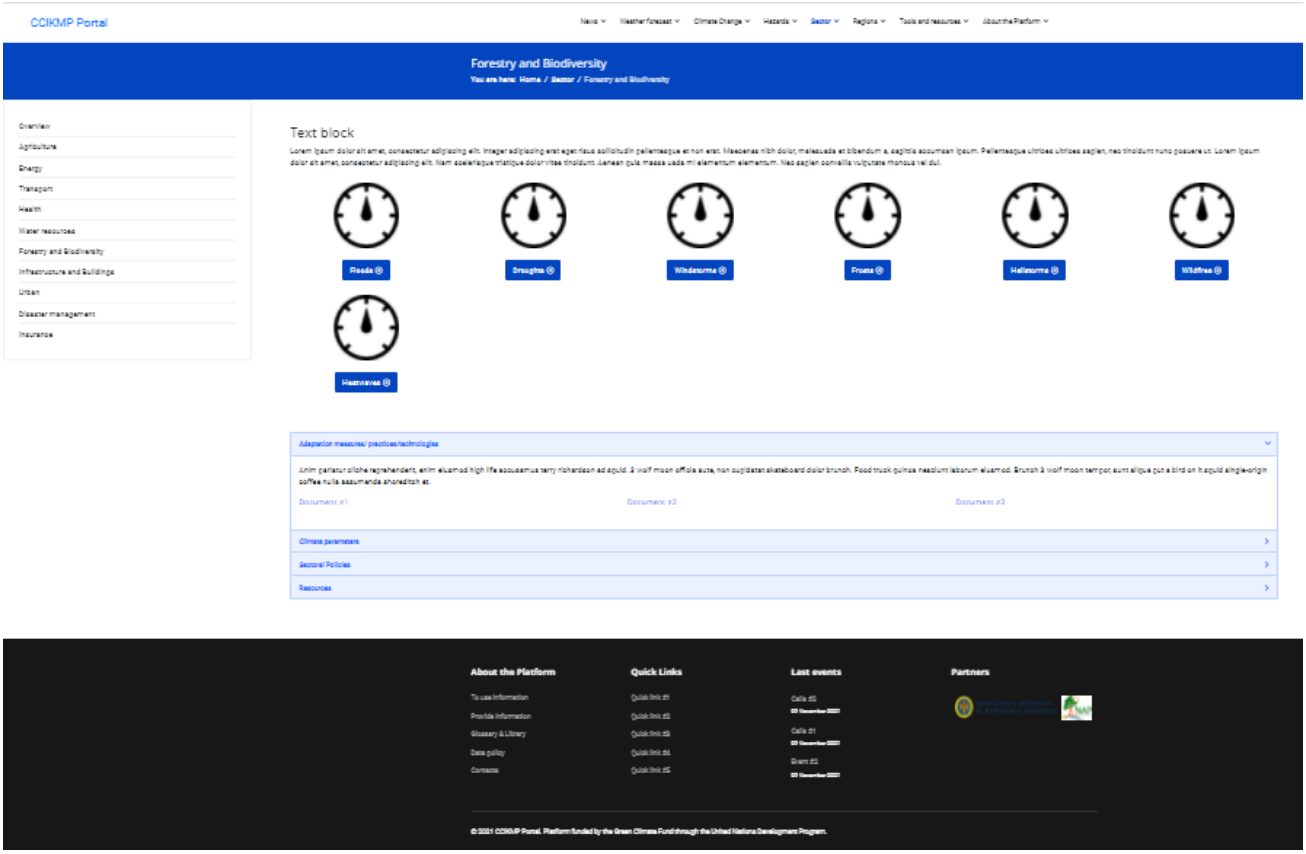


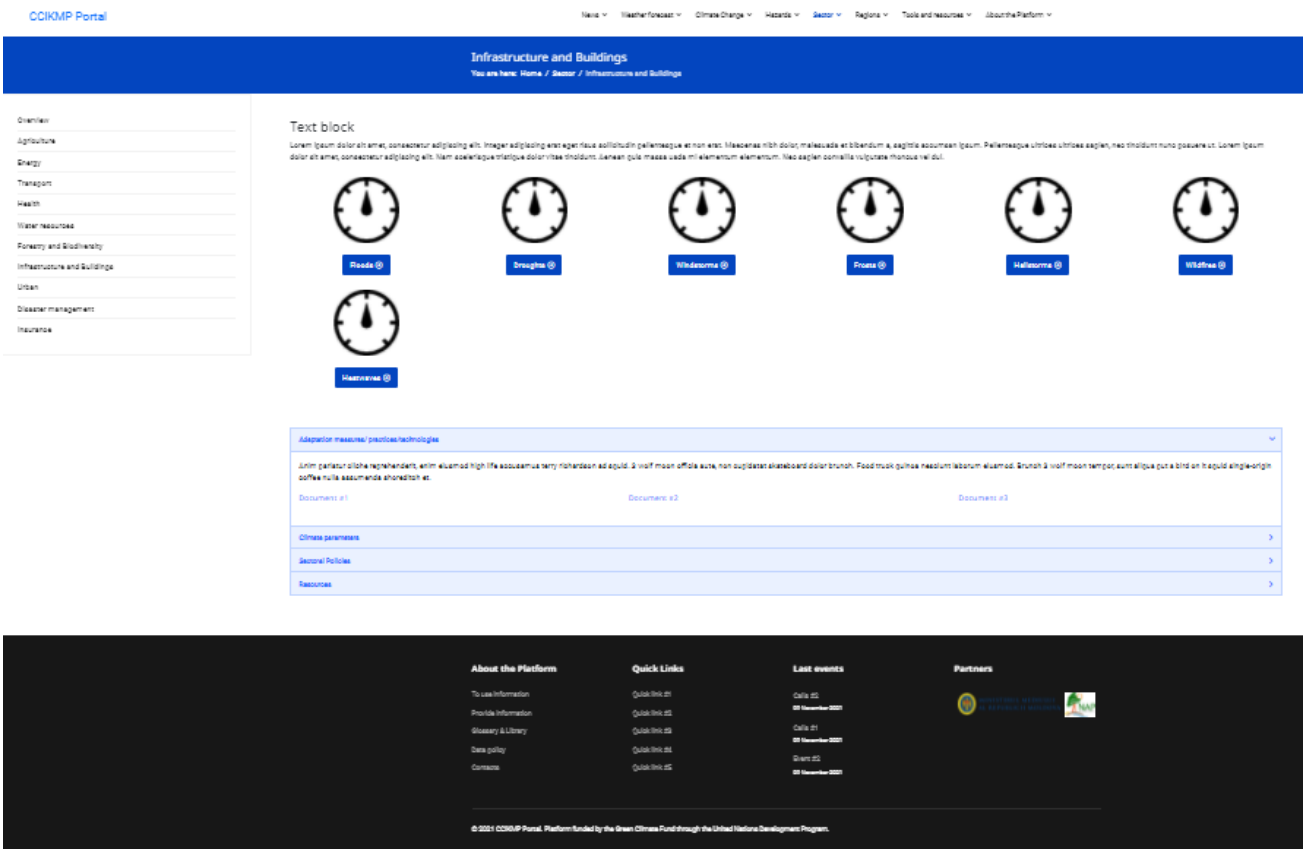
Draft mockup for page "Water resources"



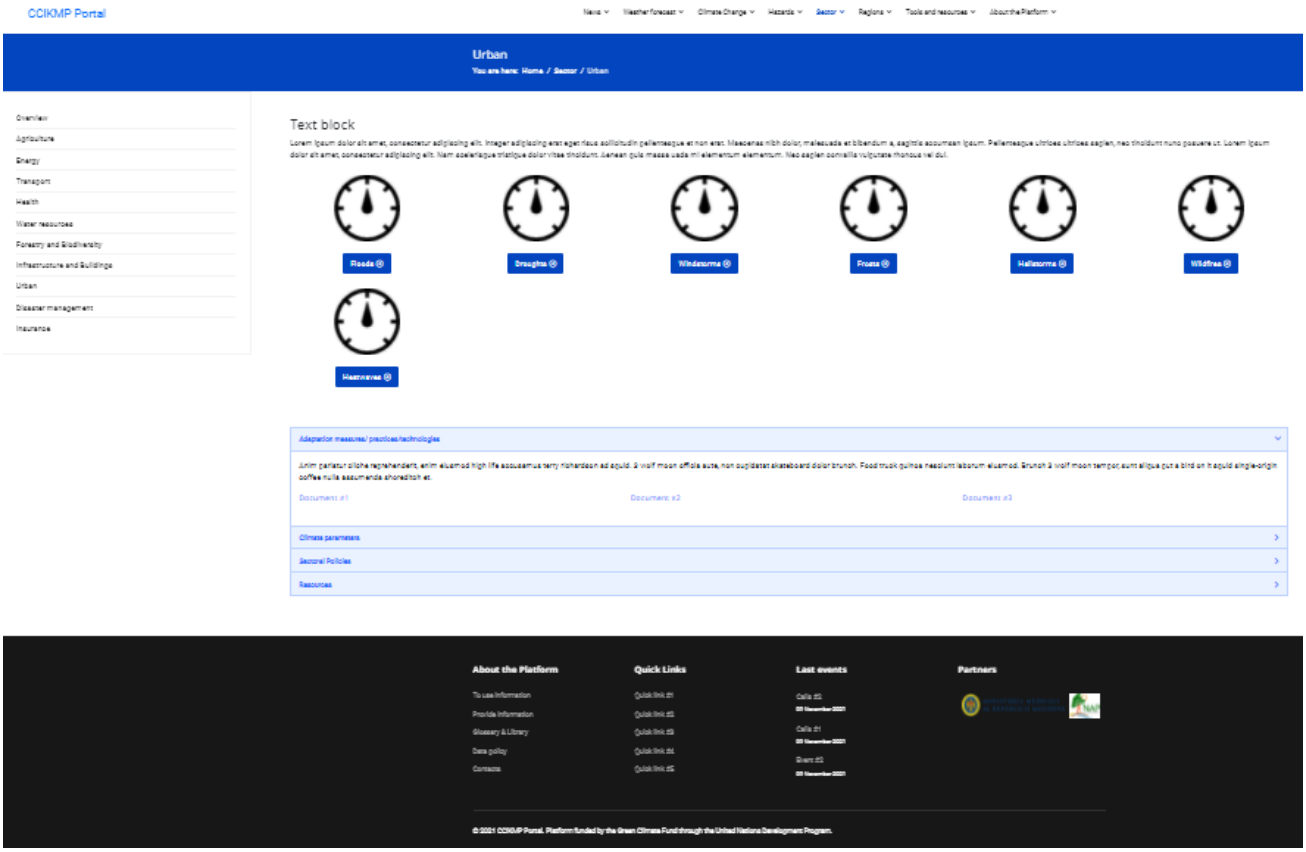
Draft mockup for page "Forestry and Biodiversity"



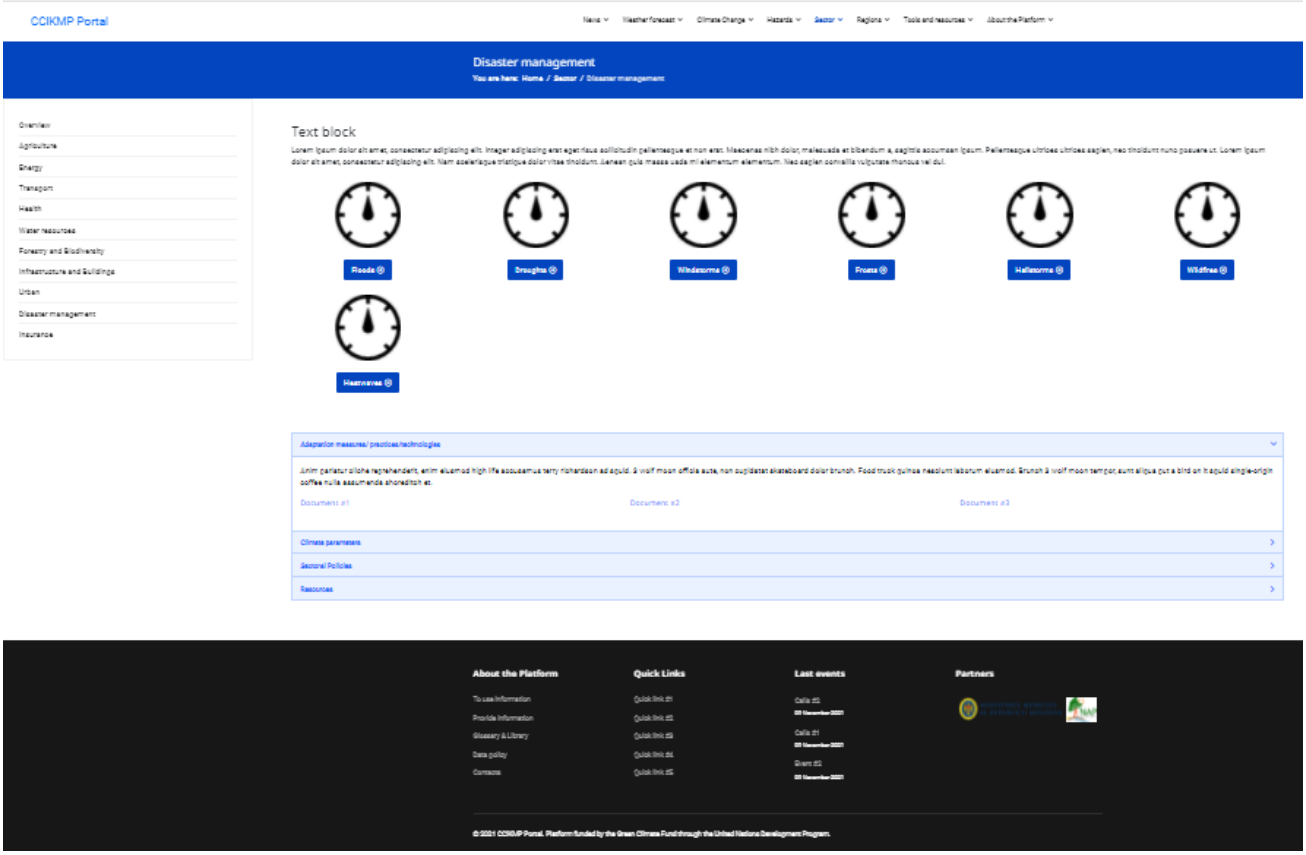
Draft mockup for page "Infrastructure and Buildings"



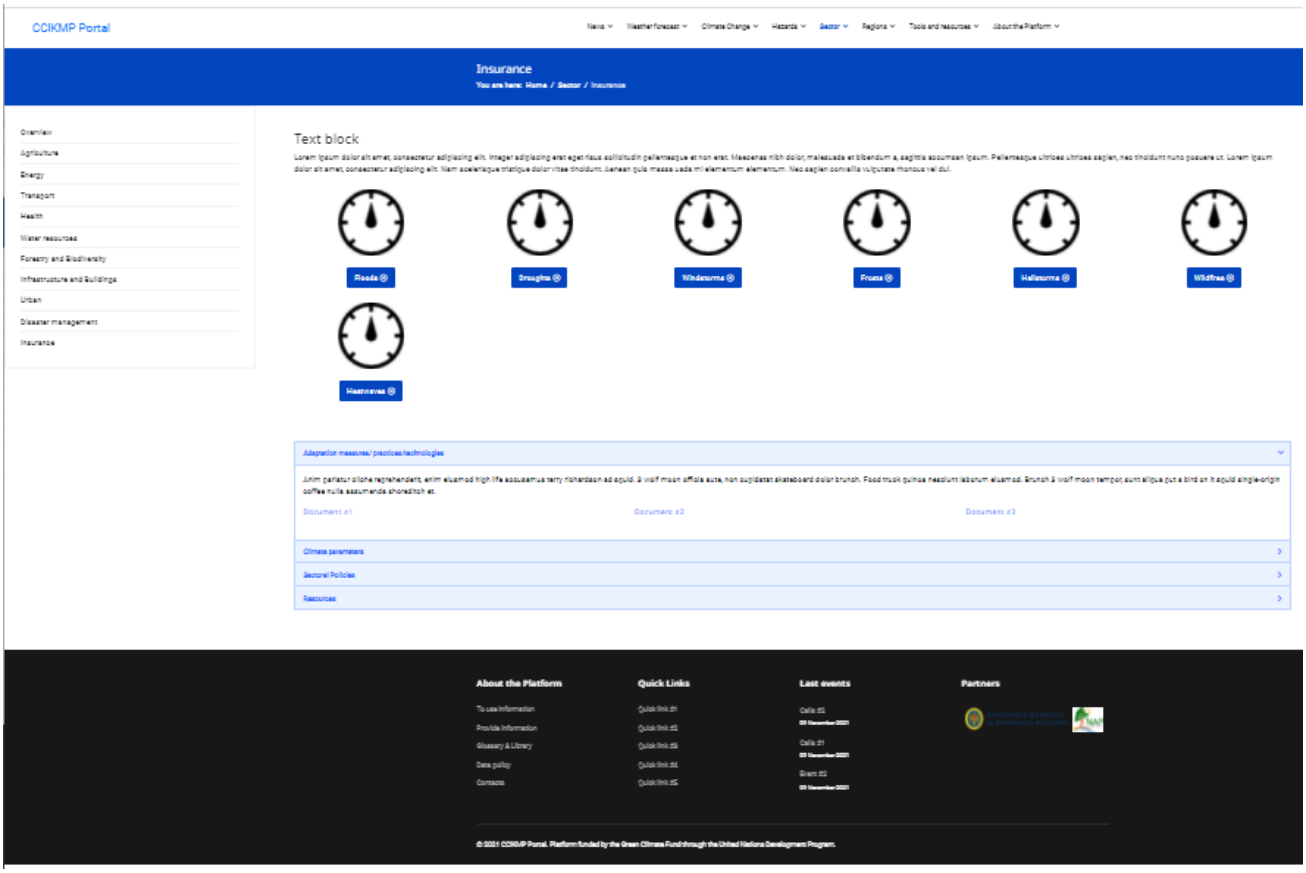
Draft mockup for page "Urban"



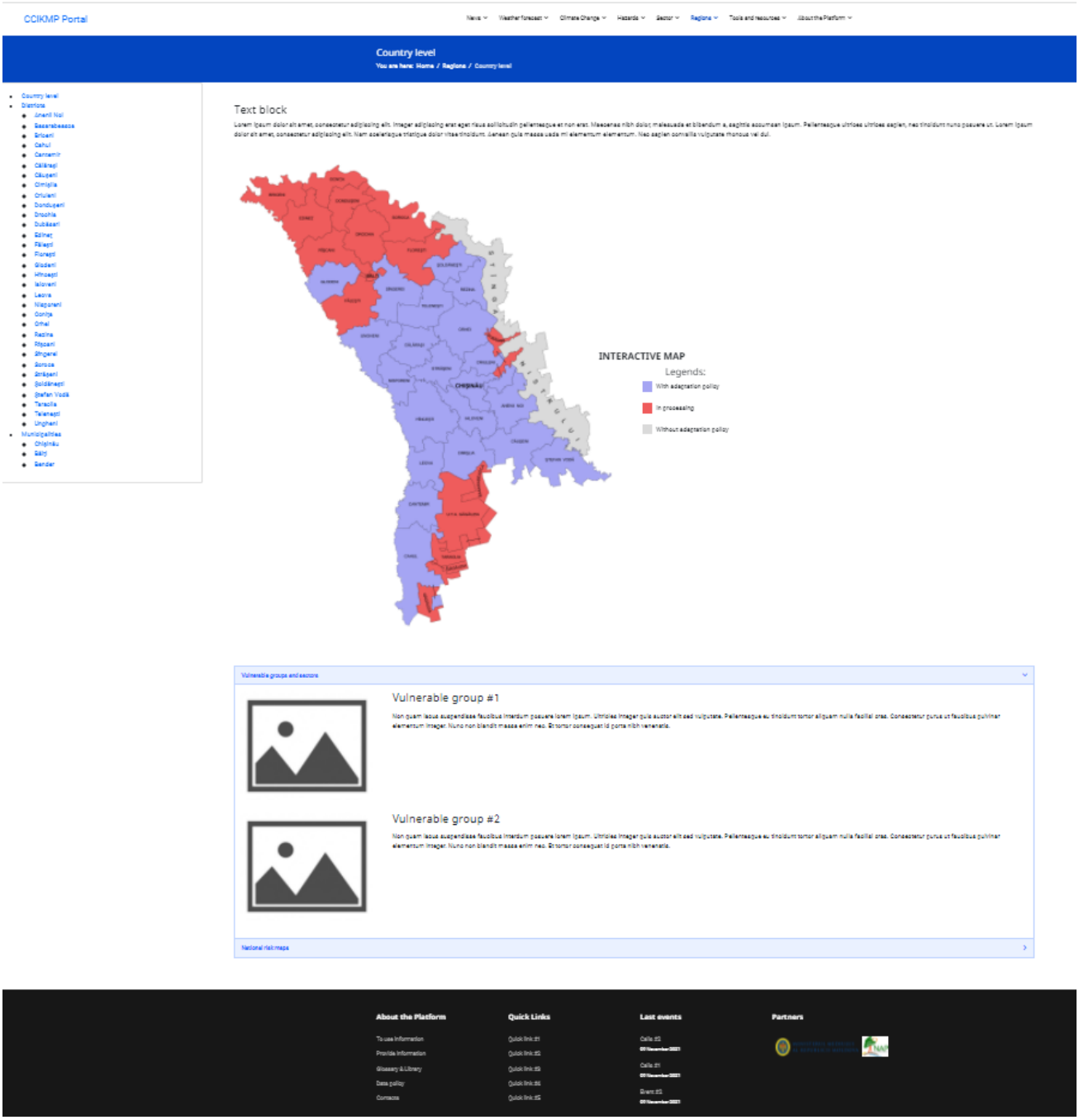
Draft mockup for page "Disaster management"

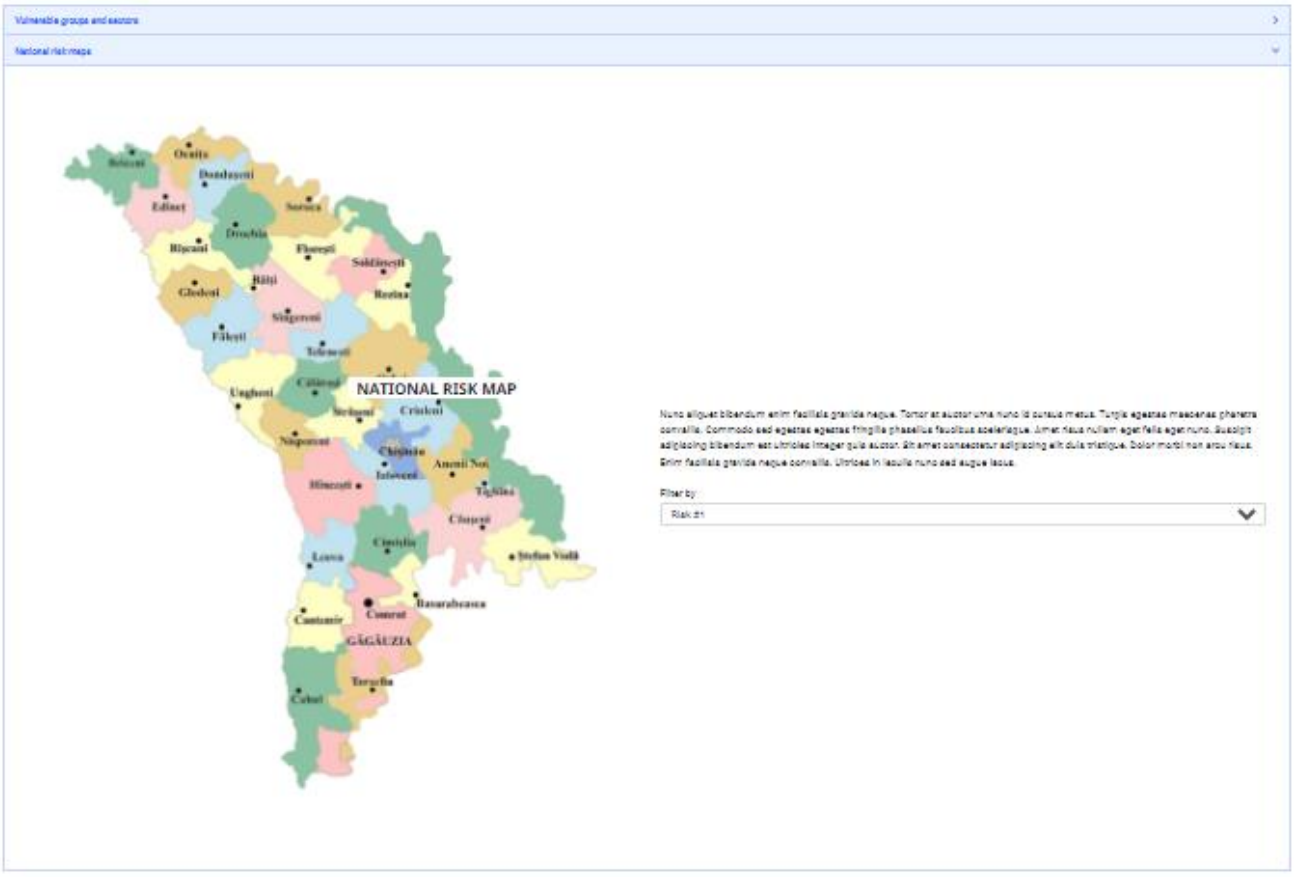


Draft mockup for page "Insurance"

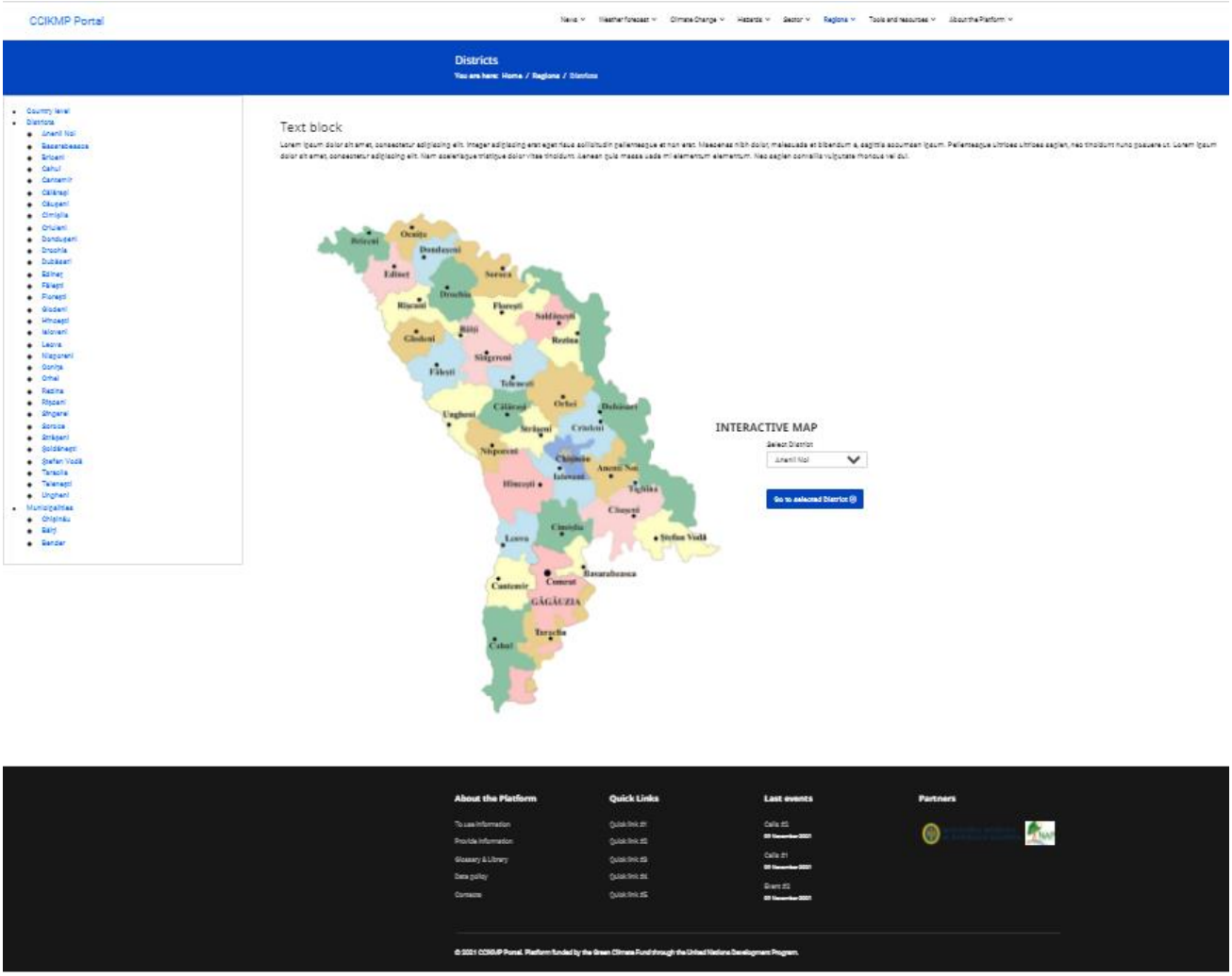


Draft mockup for page " Regions - Country level"

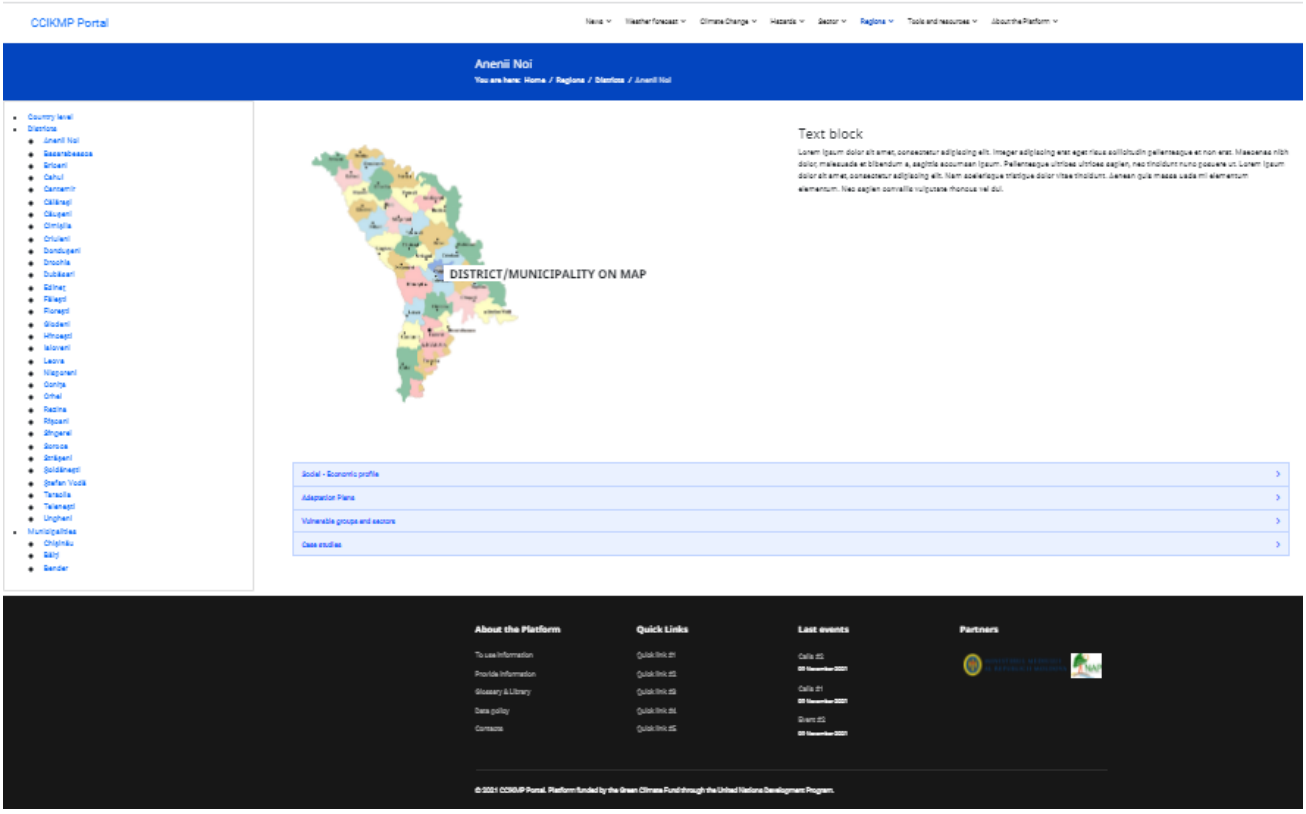


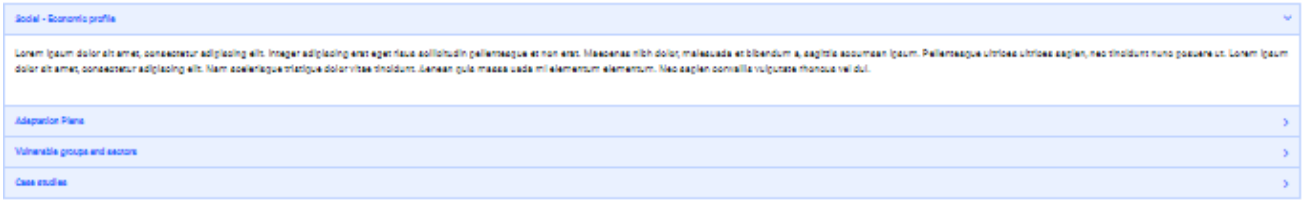

Vulnerable groups and sectors
National risk maps
NATIONAL RISK MAP
Filter by
Risk 01

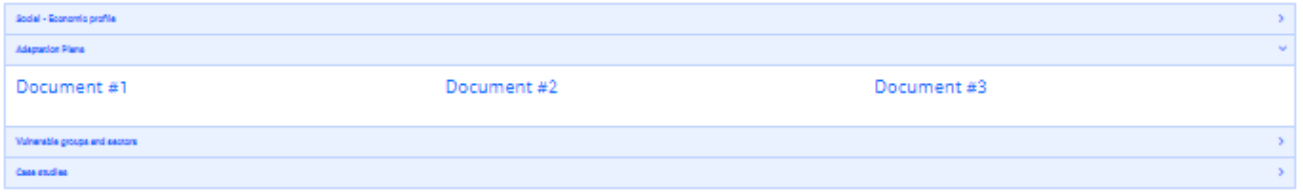
Draft mockup for page "Districts"

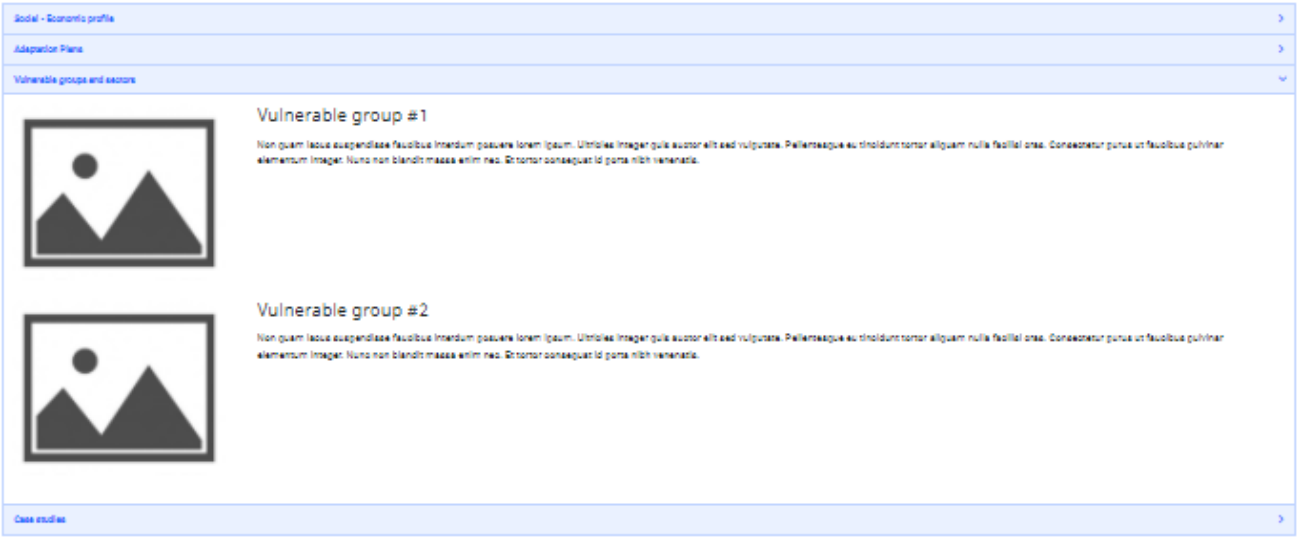


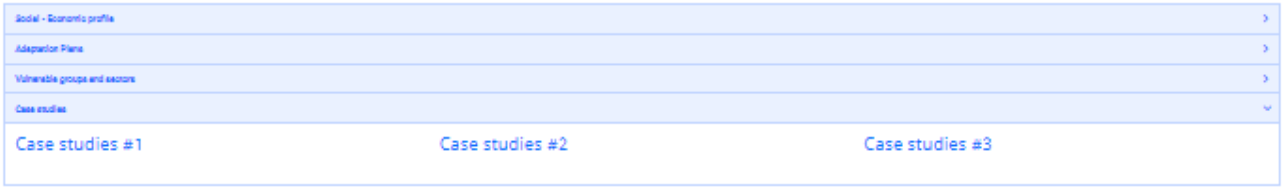
Draft mockup page for each district



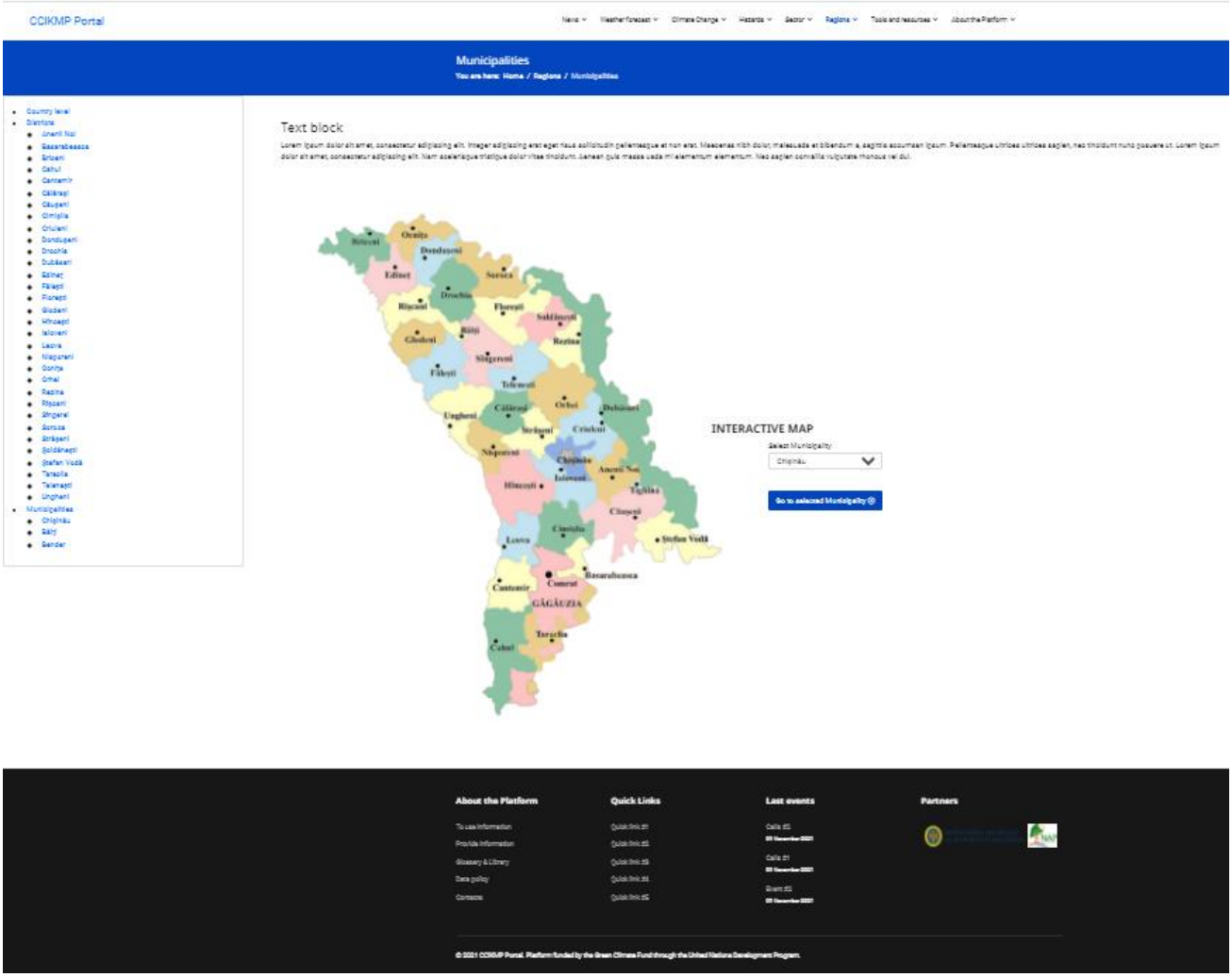




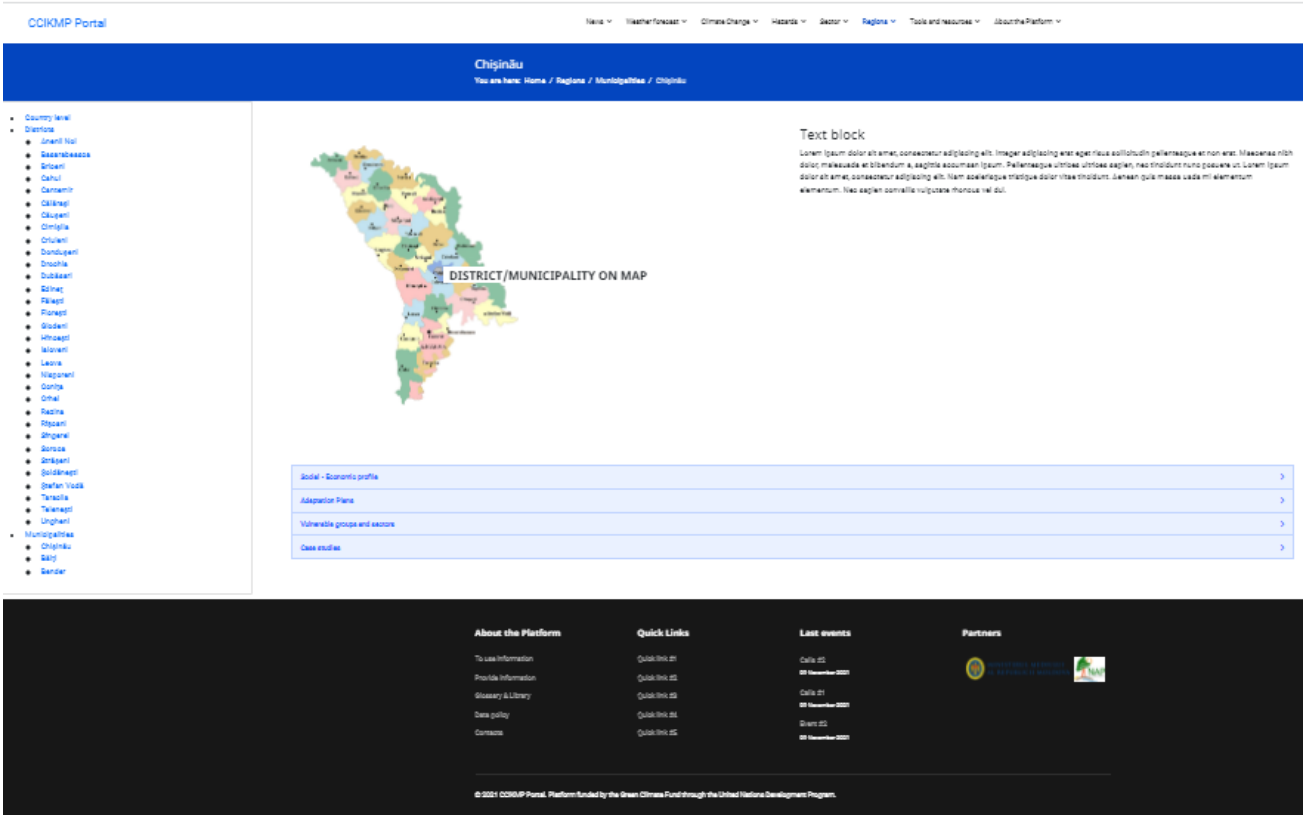


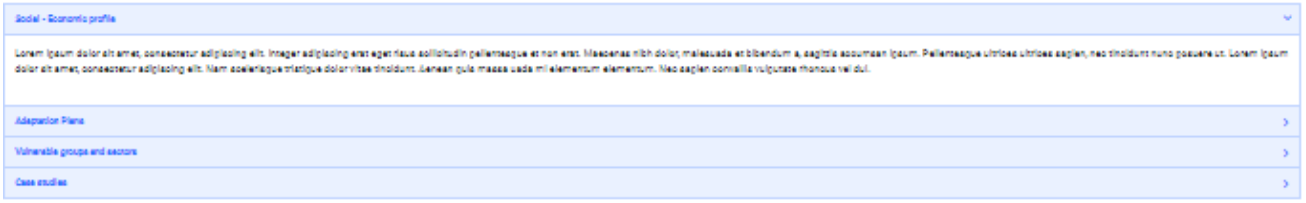


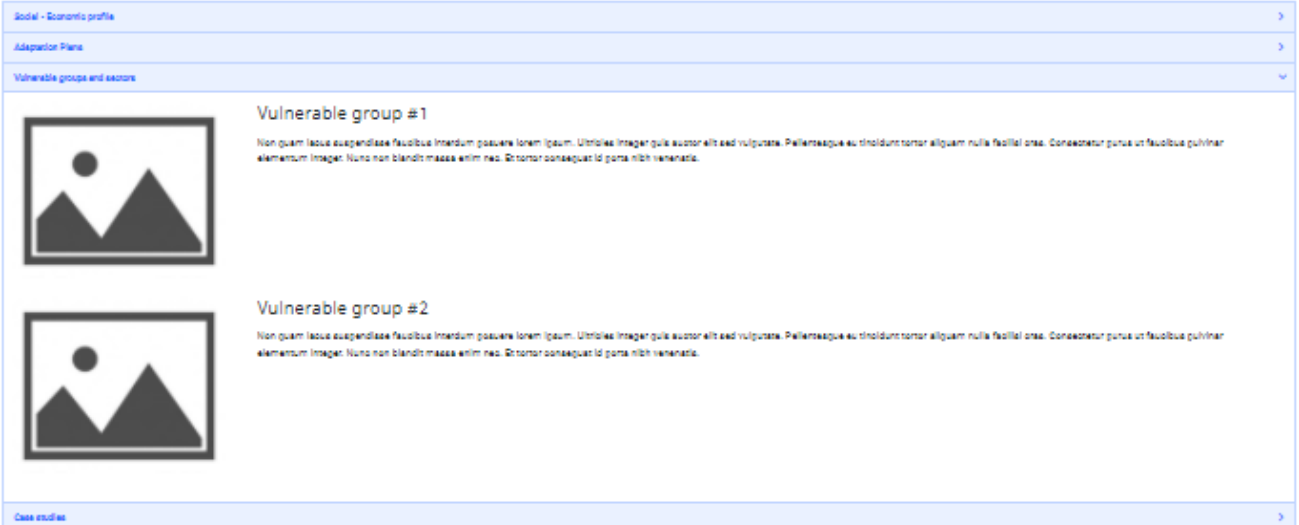
Draft mockup for page "Municipalities"

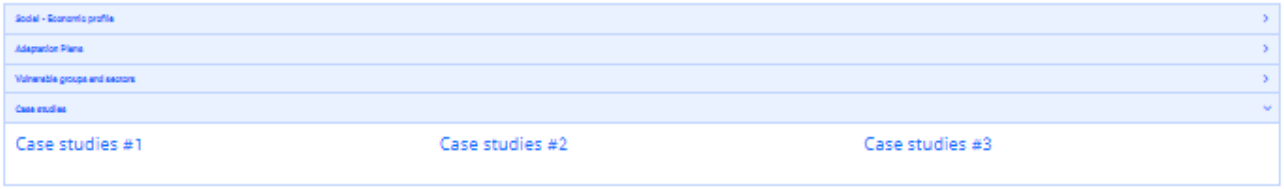


Draft mockup page for each municipality

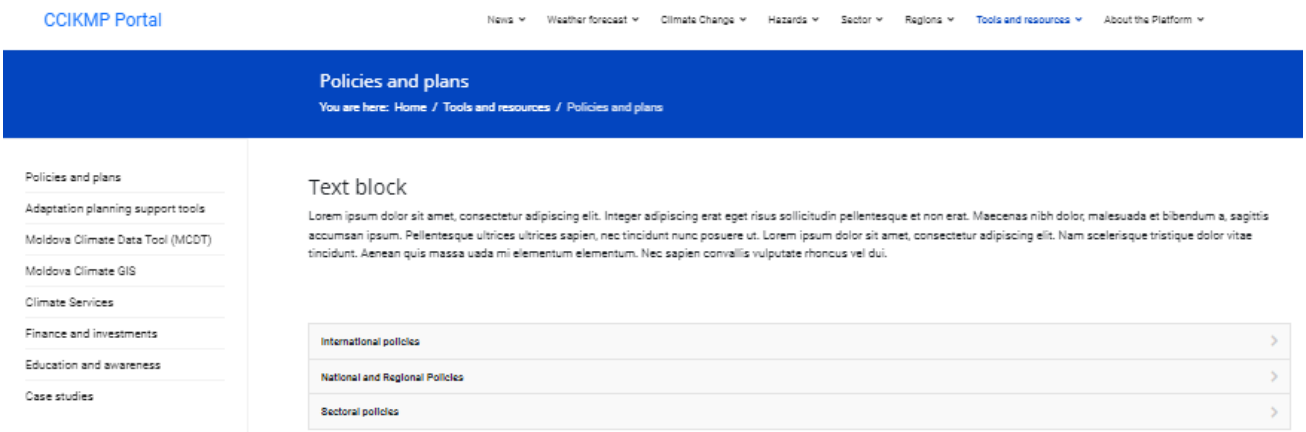


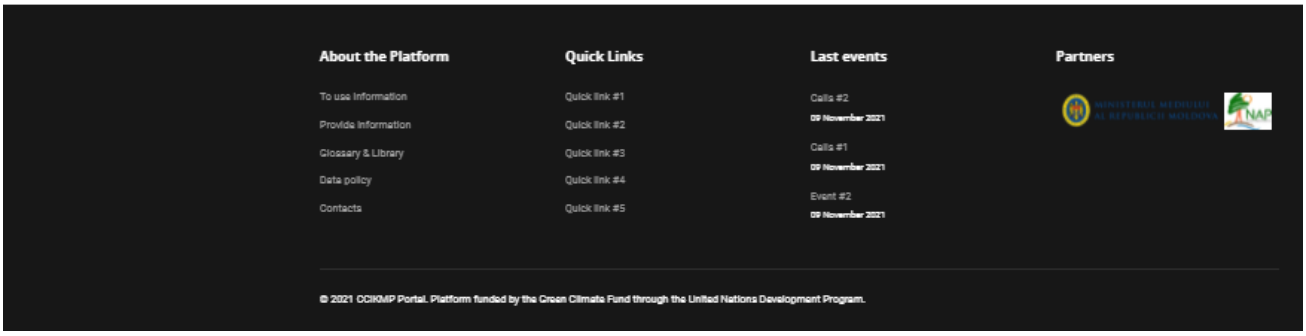


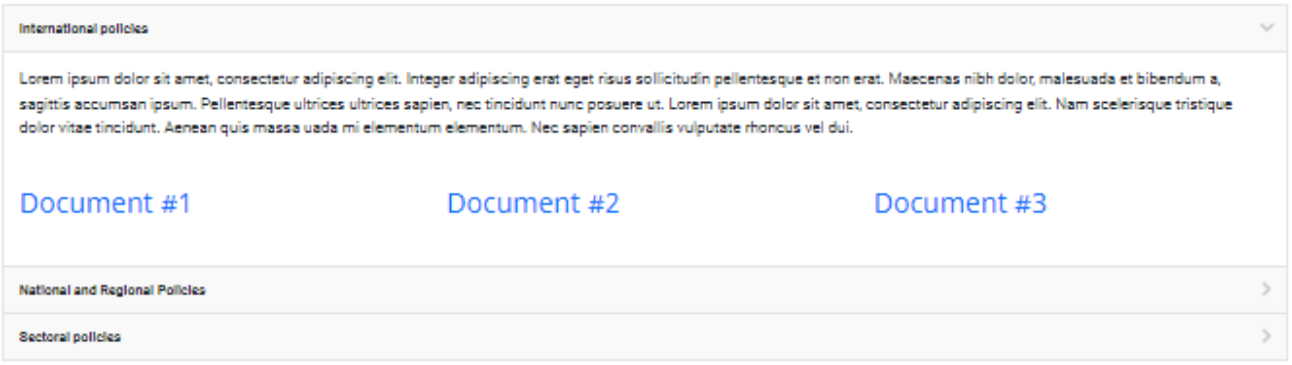


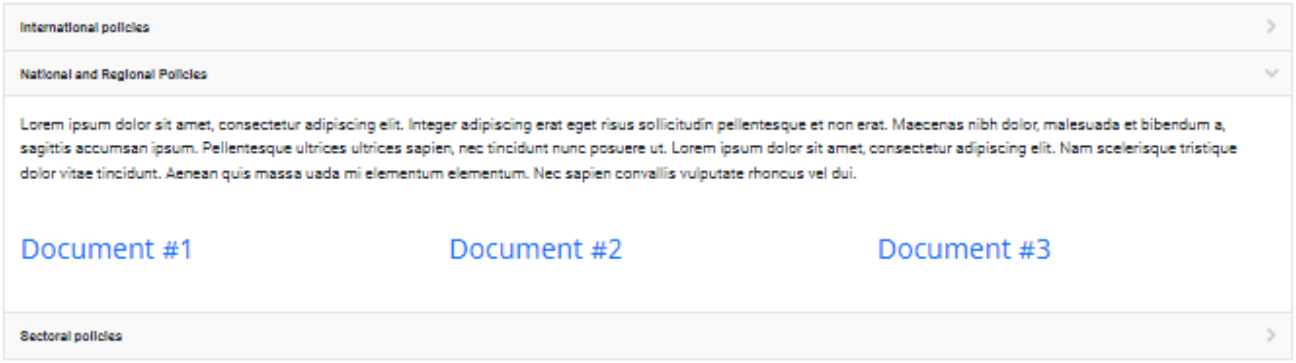


Draft mockup for page " Tools and resources - Policies and plans "








International policies
National and Regional Policies
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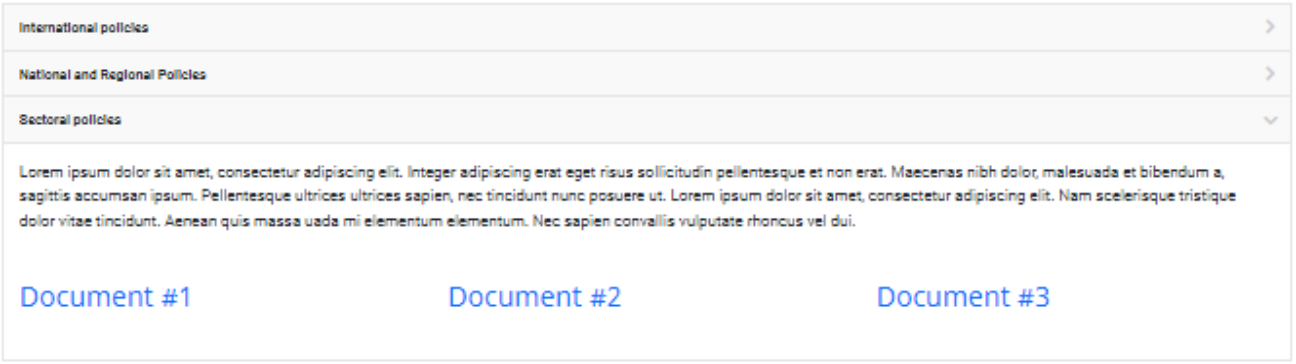
Sectoral policies


International policies
National and Regional Policies
Sectoral policies
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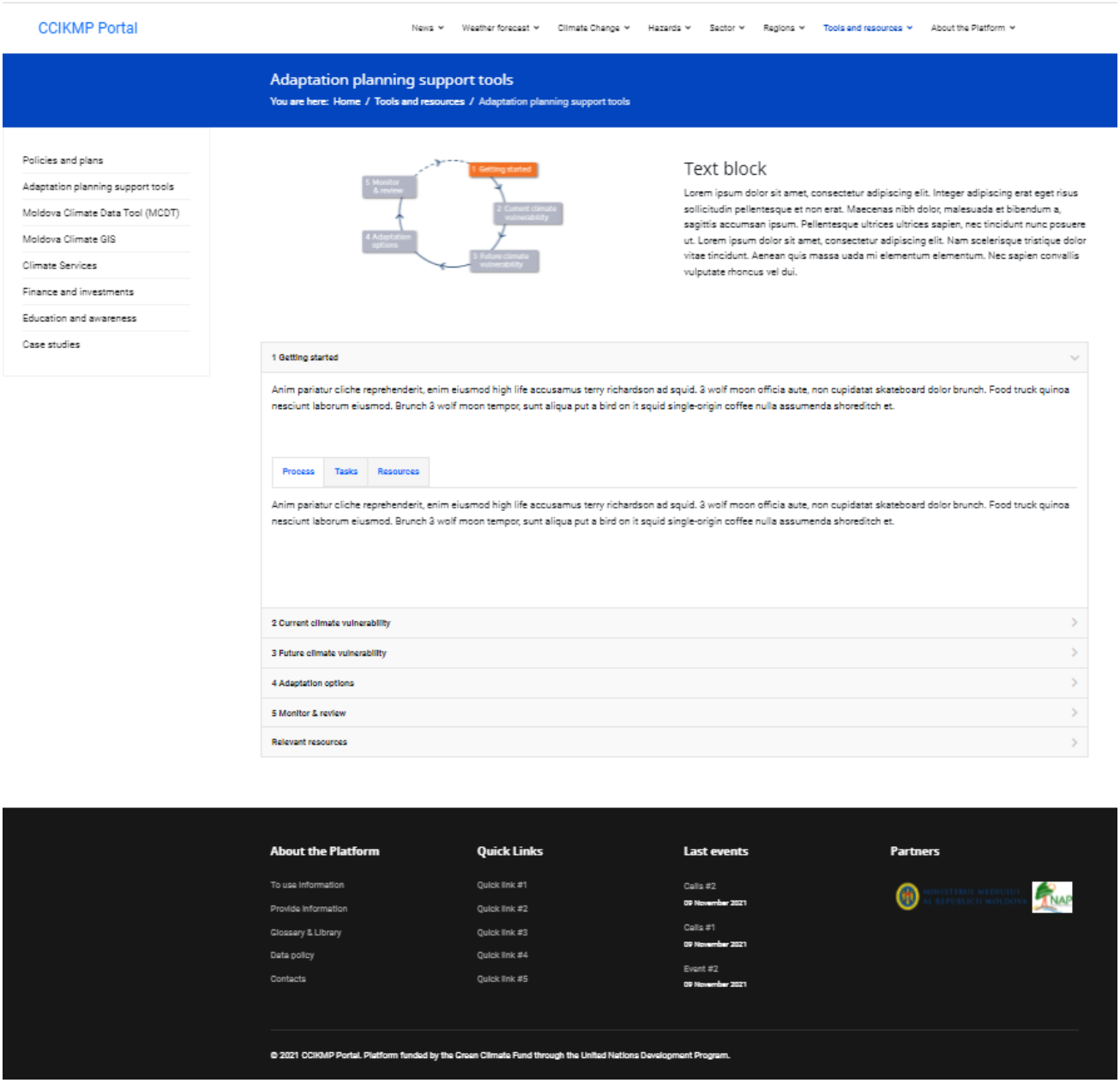
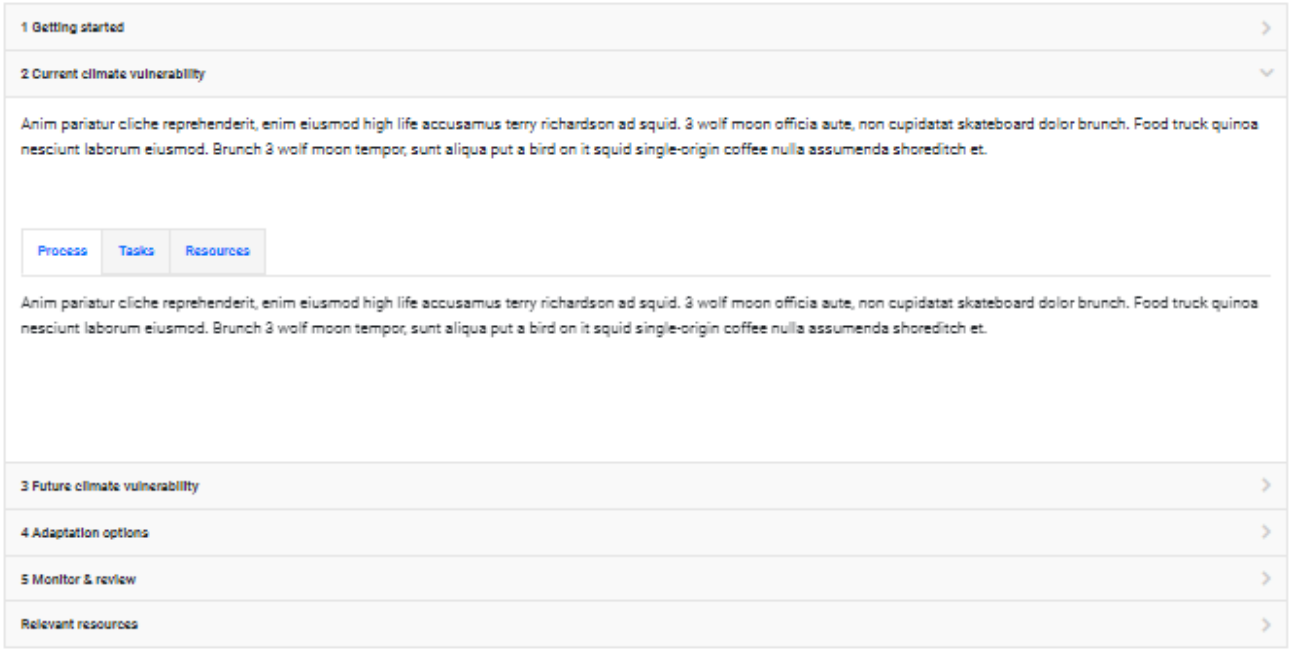
Draft mockup for page "Adaptation planning support tools "

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2 Current climate vulnerability
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3 Future climate vulnerability
4 Adaptation options
5 Monitor & review
Relevant resources


1 Getting started
2 Current climate vulnerability
3 Future climate vulnerability
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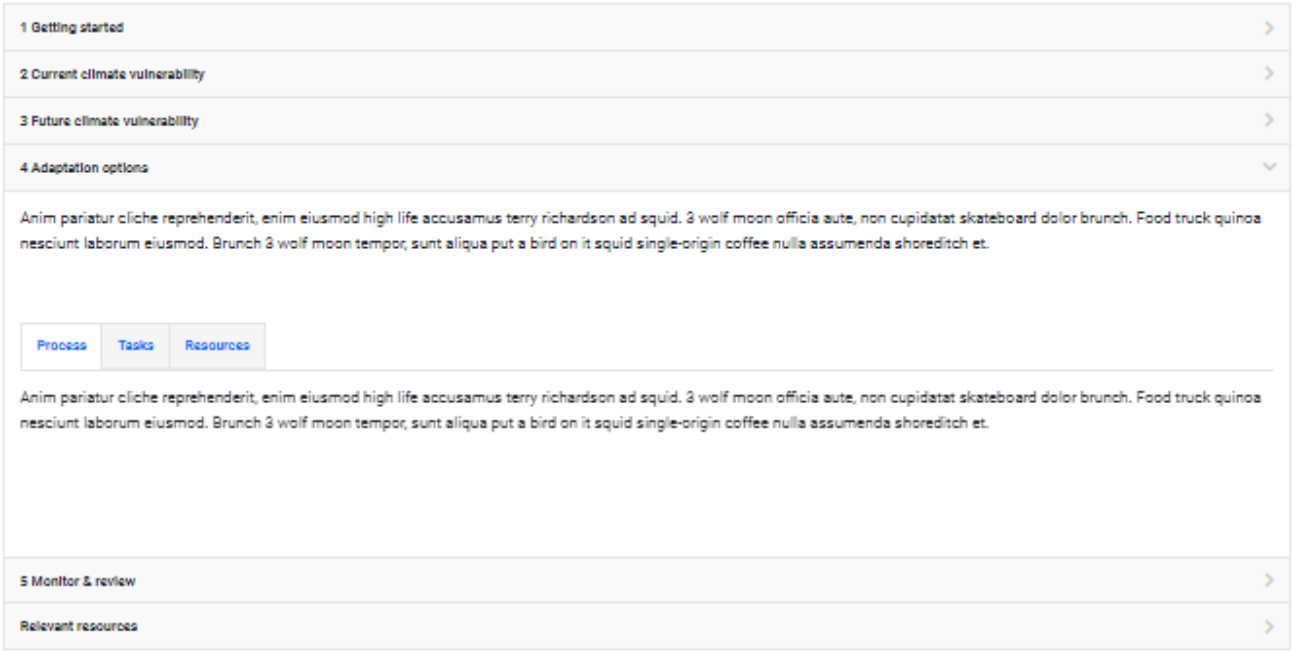
4 Adaptation options
5 Monitor & review
Relevant resources


1 Getting started
2 Current climate vulnerability
3 Future climate vulnerability
4 Adaptation options
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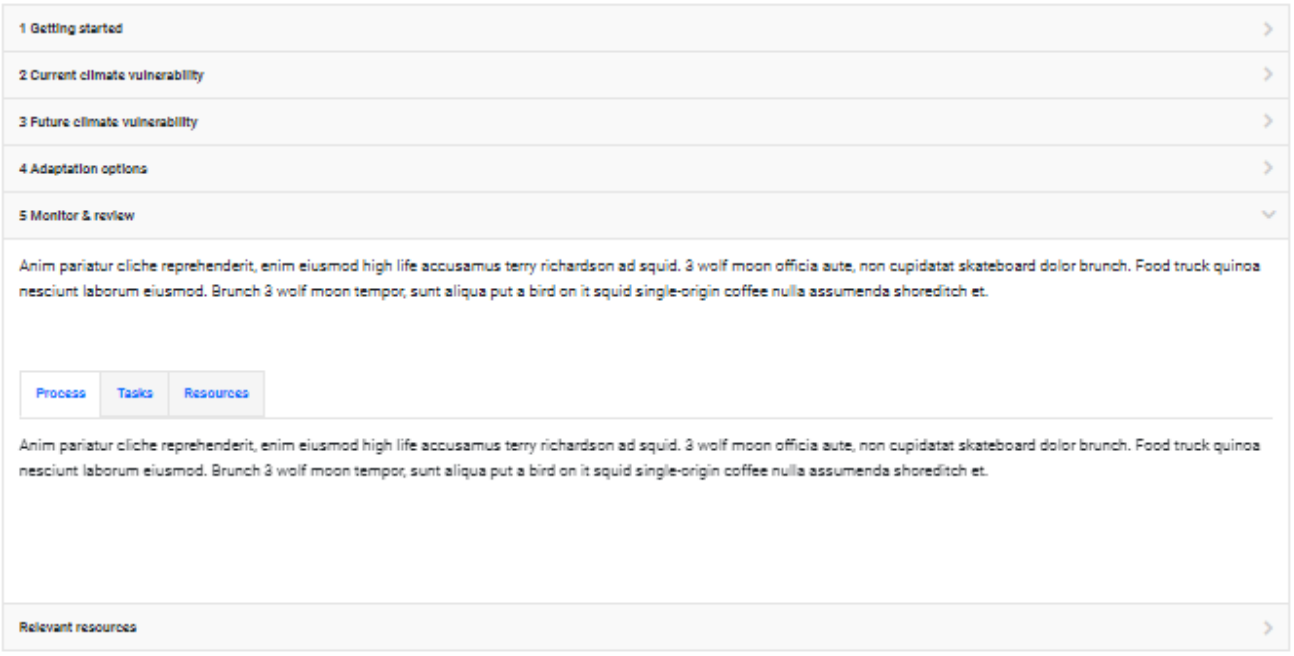
5 Monitor & review
Relevant resources


1 Getting started
2 Current climate vulnerability
3 Future climate vulnerability
4 Adaptation options
5 Monitor & review
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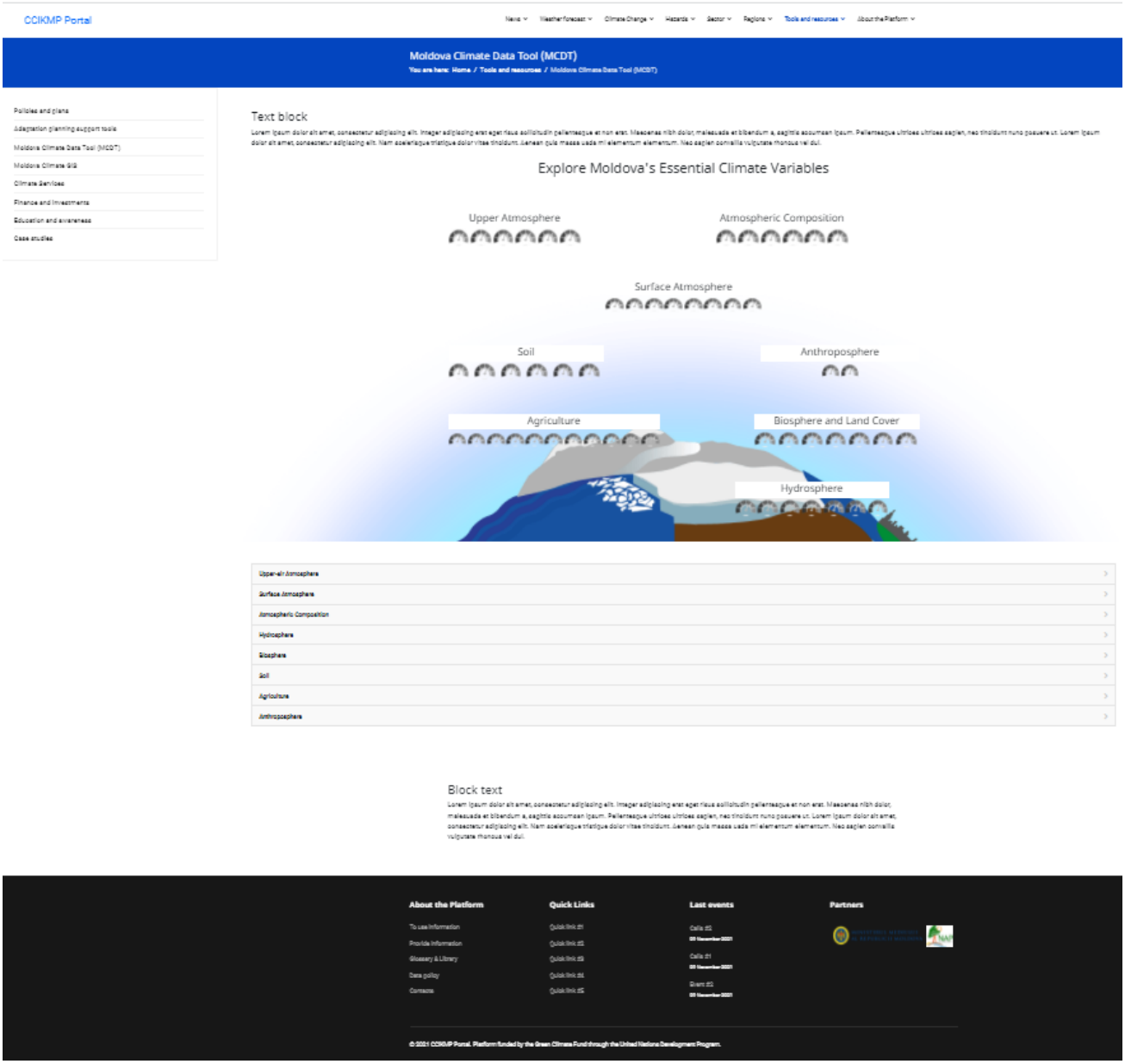
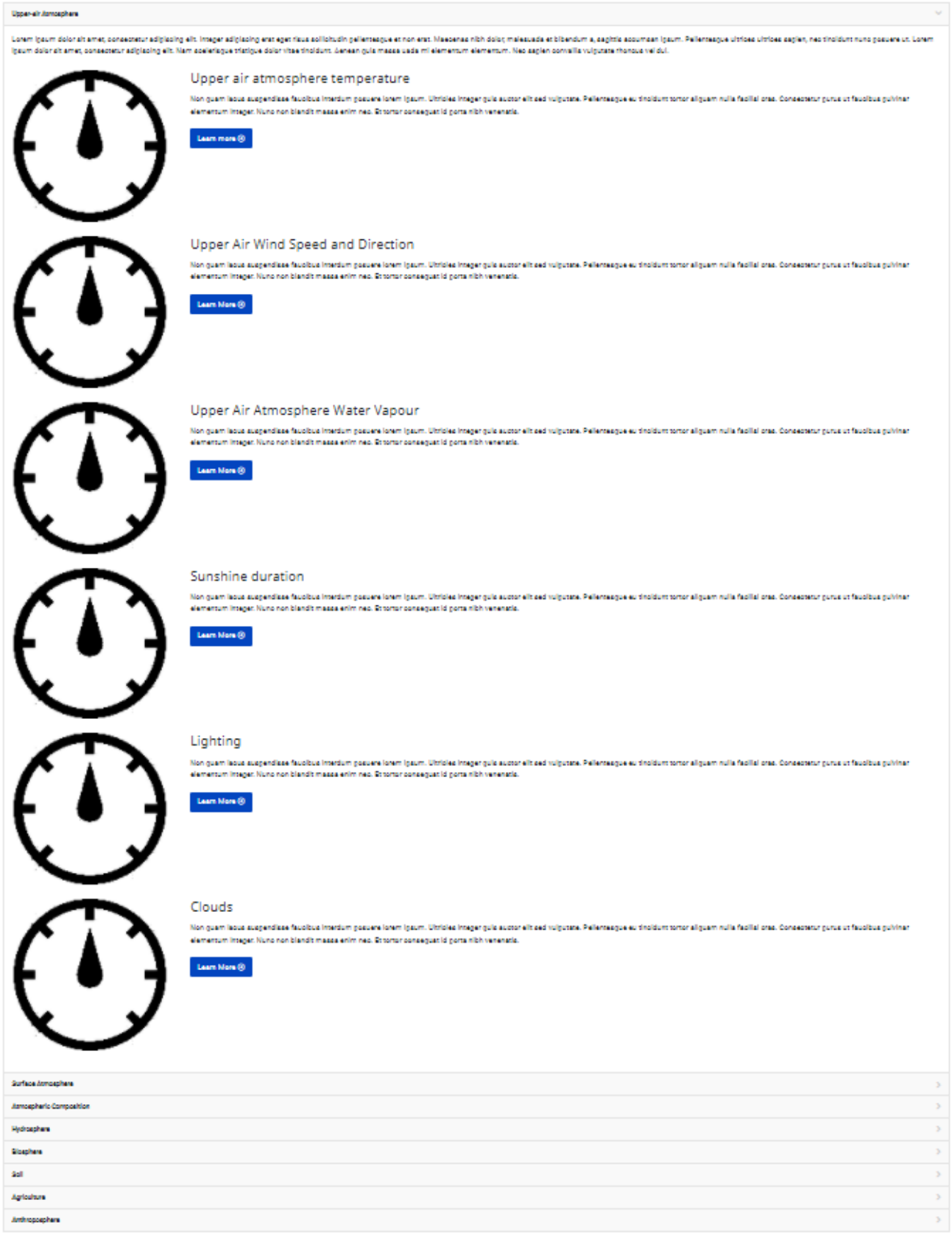
Relevant resources


1 Getting started
2 Current climate vulnerability
3 Future climate vulnerability
4 Adaptation options
5 Monitor & review
Relevant resources
Resource #1
Resource #2
Resource #3

Draft mockup for page "Moldova Climate Data Tool (MCDT)"




Upper-air Atmosphere
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Learn more
Upper Air Wind Speed and Direction
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Upper Air Atmosphere Water Vapour
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Learn More
Sunshine duration
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Learn More
Lighting
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Learn More
Clouds
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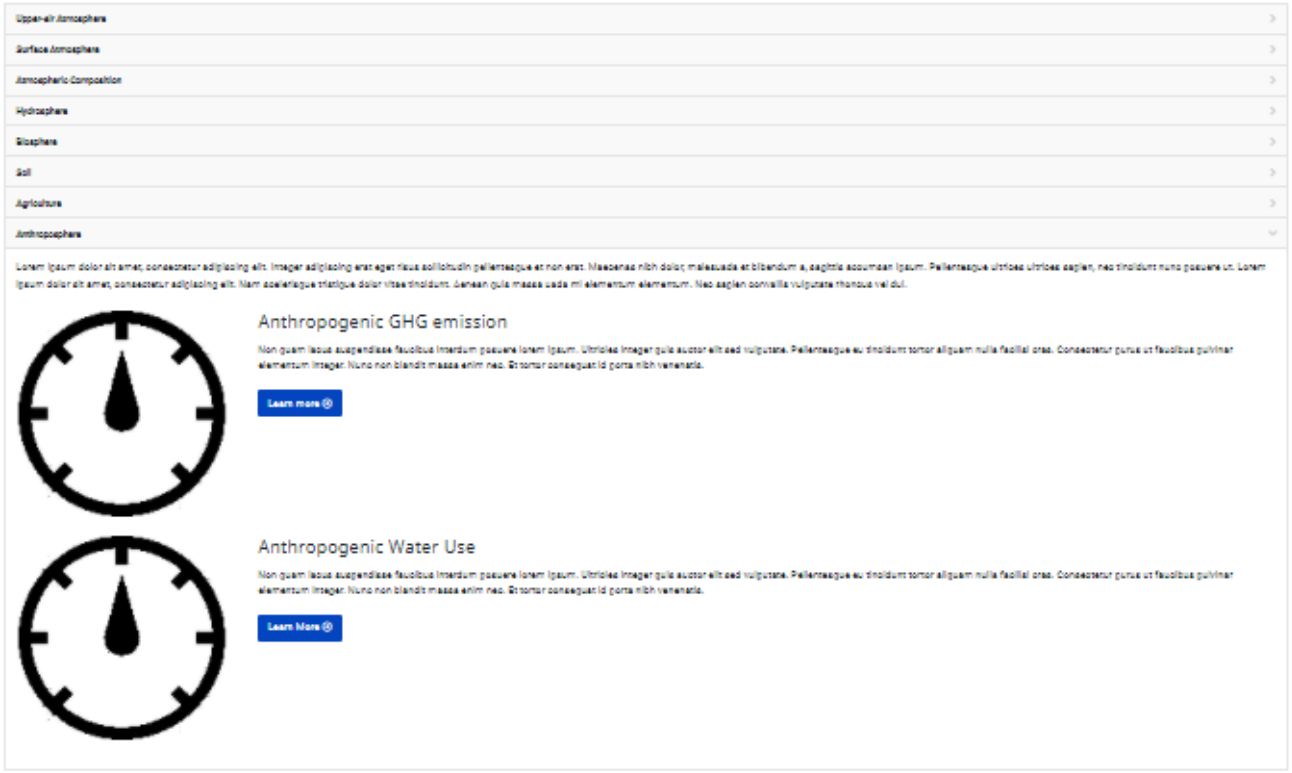
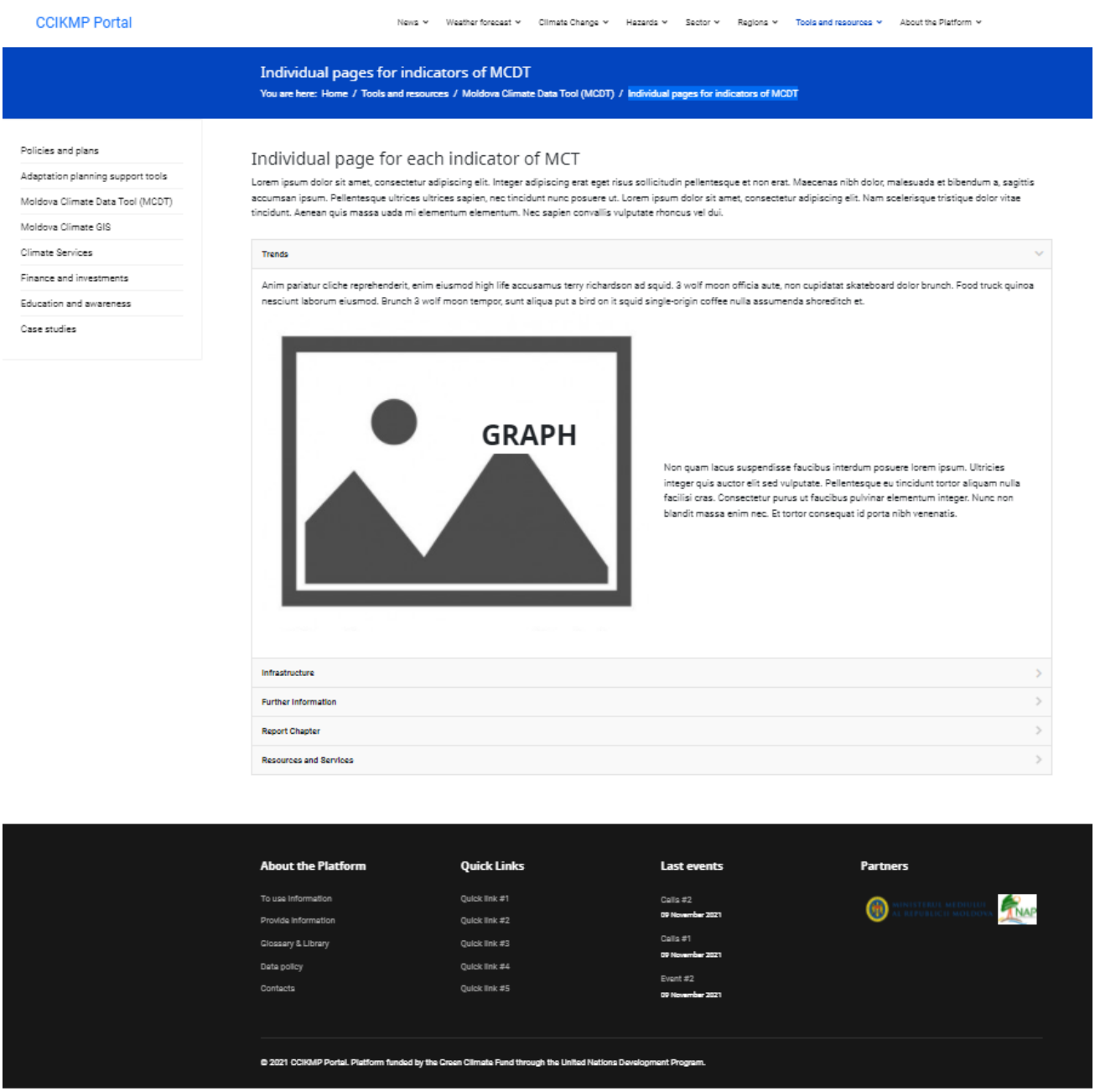
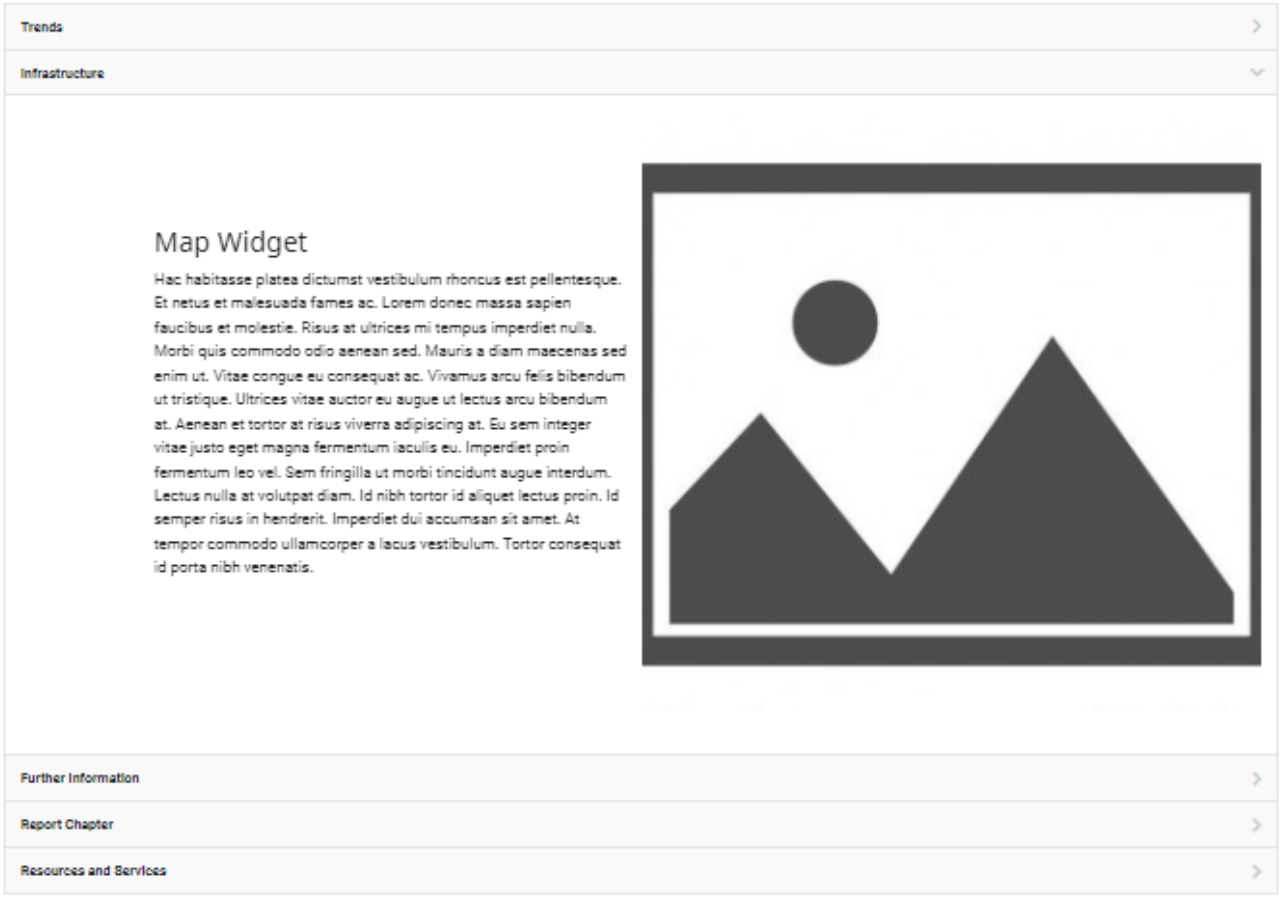
Learn More
Surface Atmosphere
Atmospheric Composition
Hydrosphere
Biosphere
Soil
Agriculture
Anthroposphere


Upper-air Atmosphere
Surface Atmosphere
Atmospheric Composition
Hydrosphere
Biosphere
Soil
Agriculture
Anthropogenic
Anthropogenic GHG emission
Learn more
Anthropogenic Water Use
Learn More

Draft mockup for page Individual pages for indicators of MCDT




Trends
Infrastructure
Map Widget
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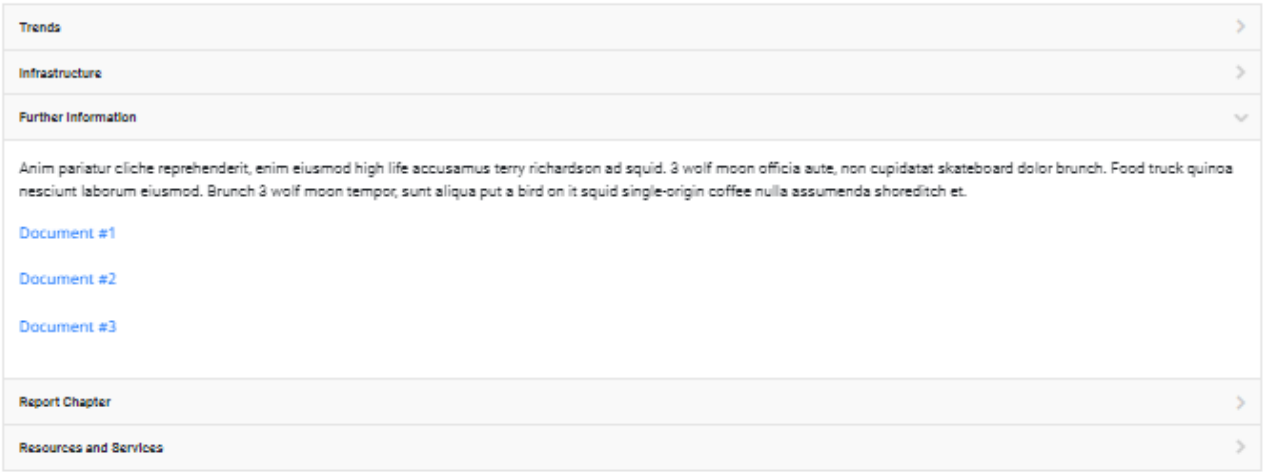
Further Information
Report Chapter
Resources and Services


Trends
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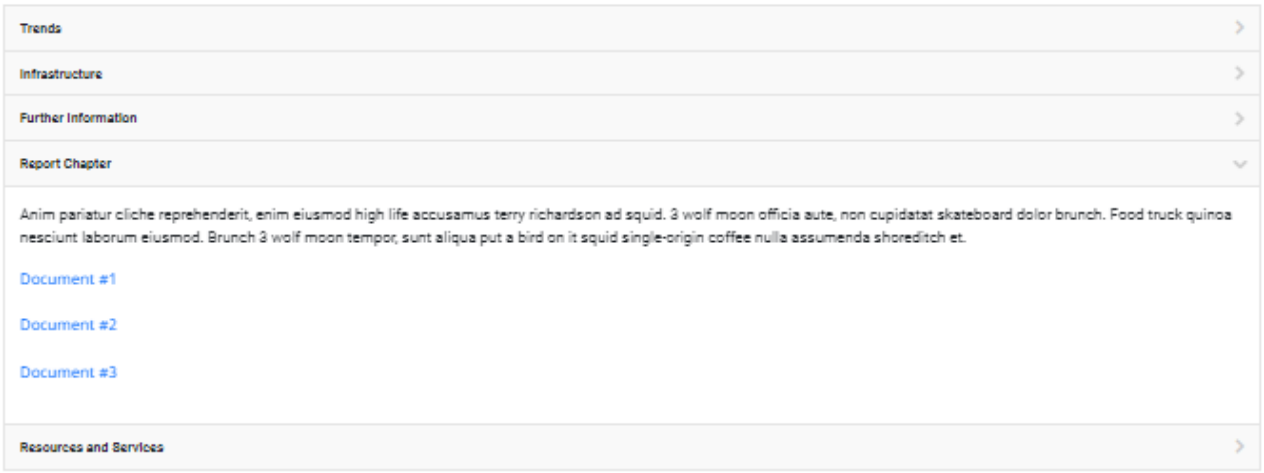
Document #1
Document #2
Document #3
Report Chapter
Resources and Services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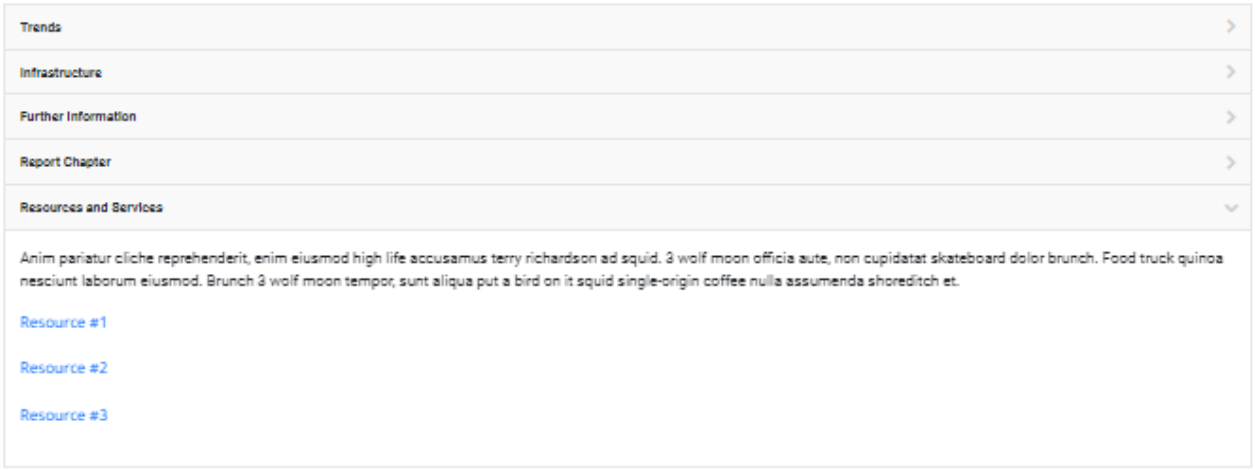
Resources and Services


Trends
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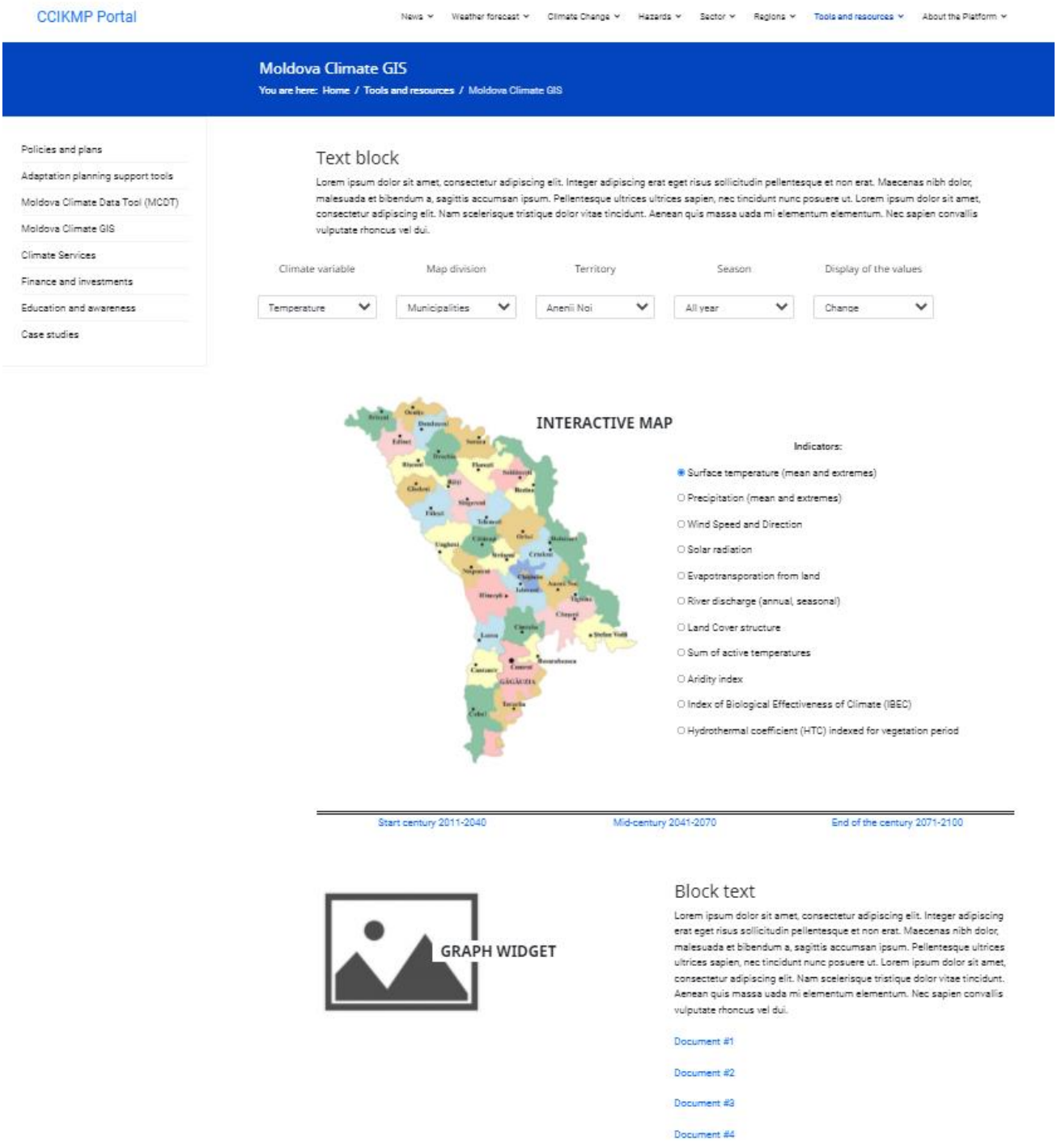
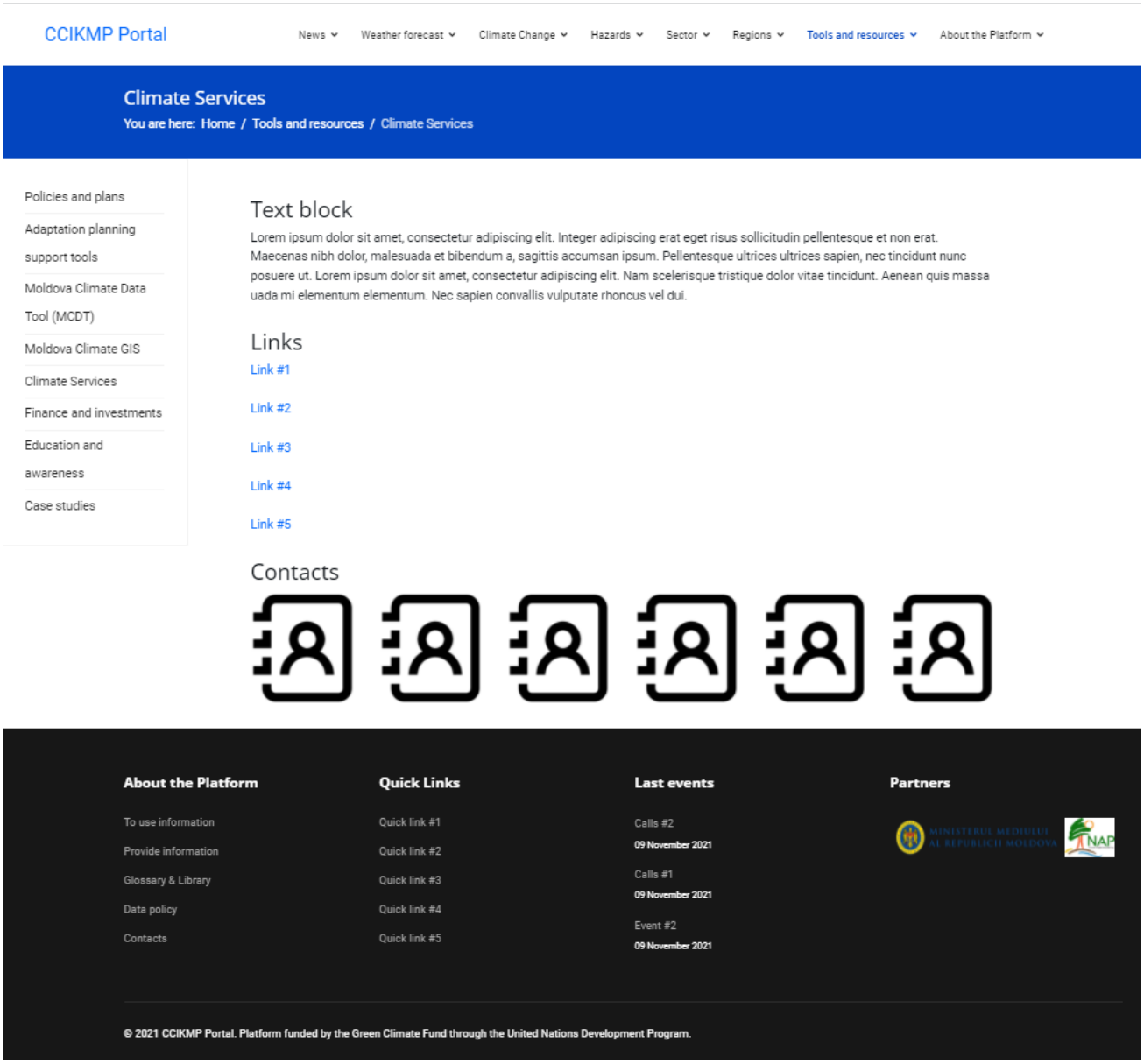
Resource #1
Resource #2
Resource #3

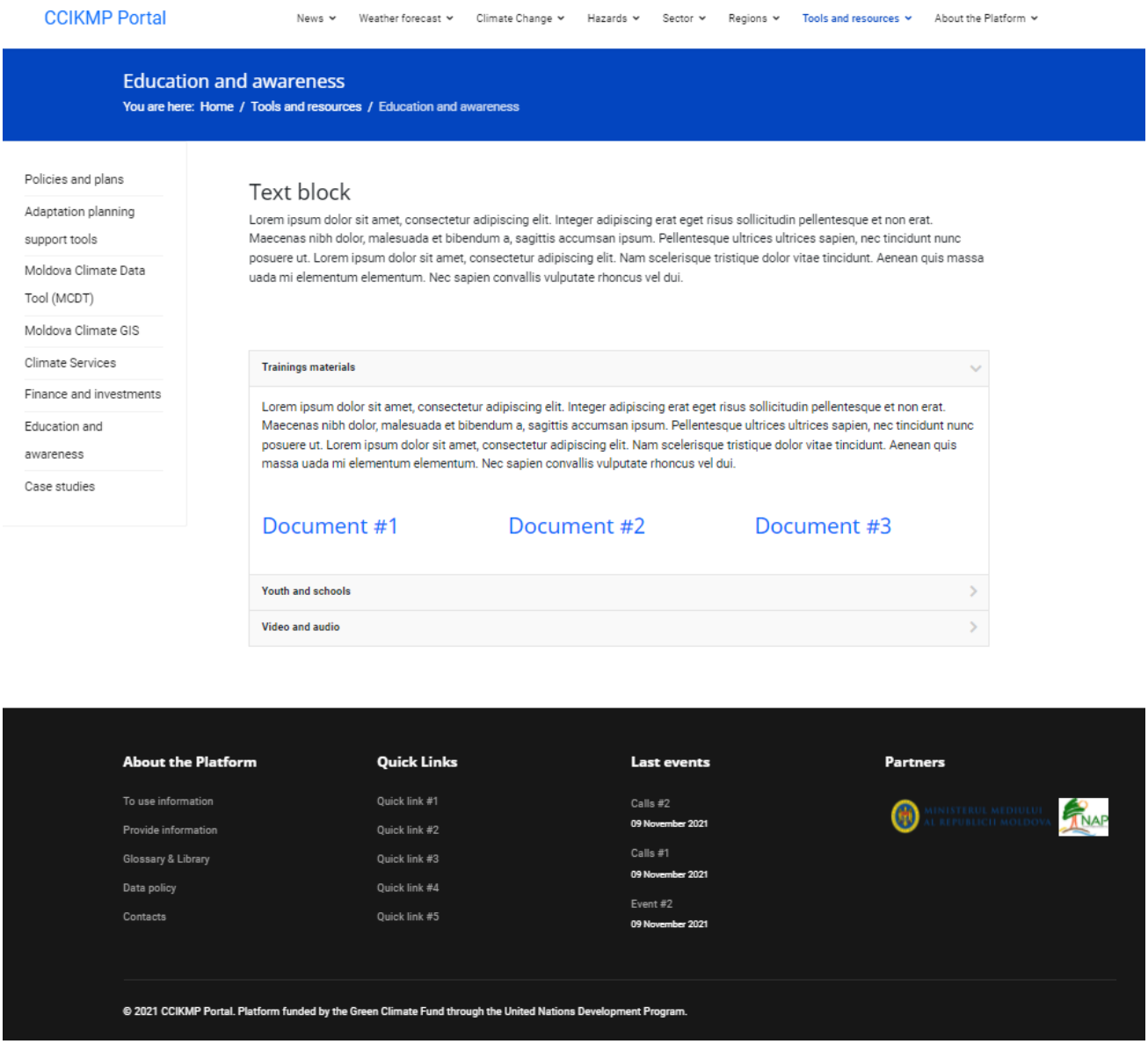
Draft mockup for page "Moldova Climate GIS"

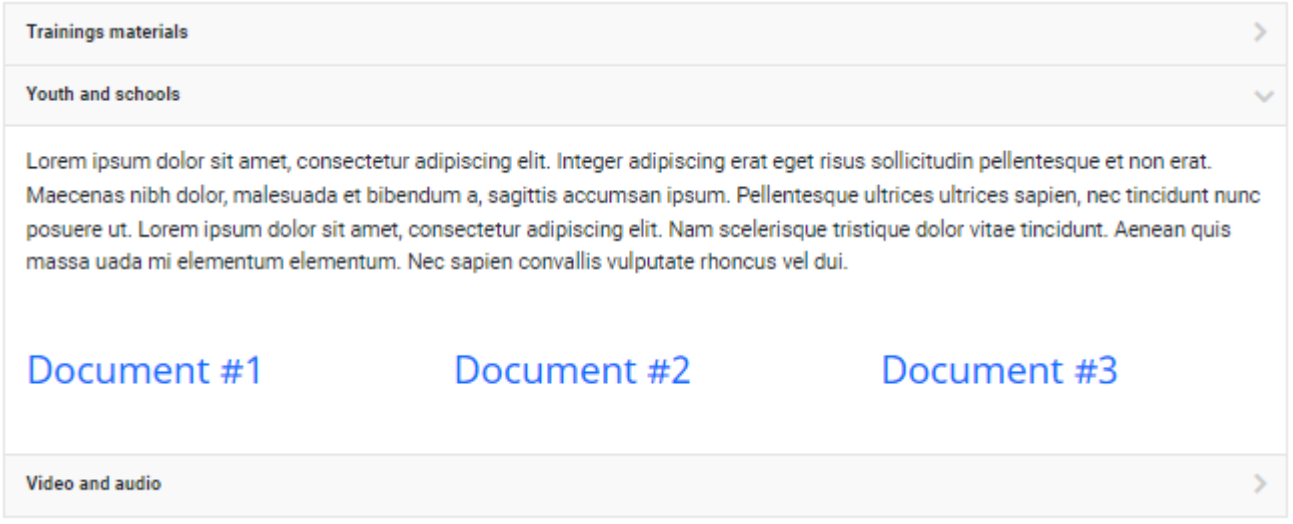


Draft mockup for pages "Climate Services", "Finance and investments"



Draft mockup for page "Education and awareness"





Trainings materials

Youth and schools

Video and audio

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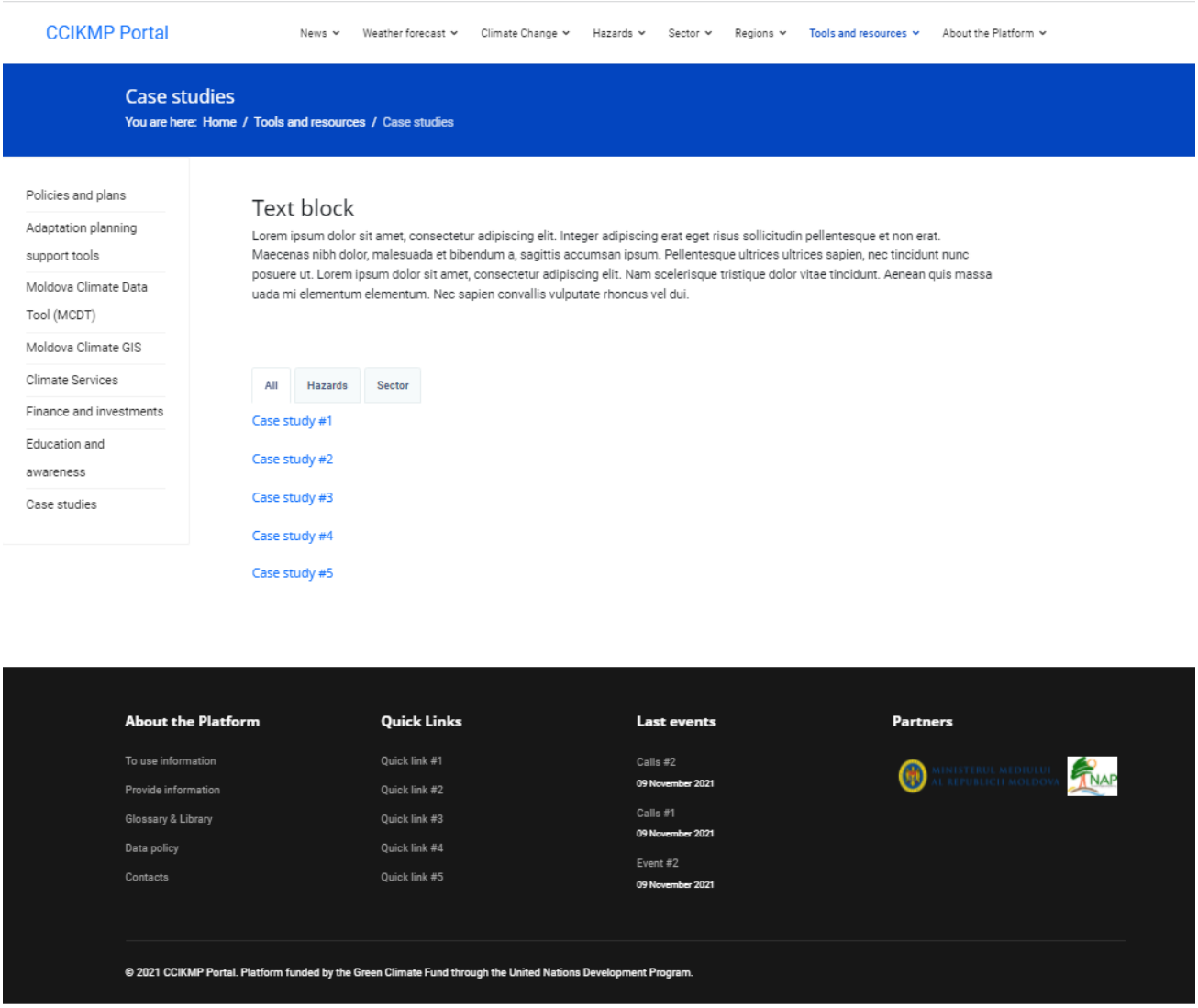
Video #1

Video #2

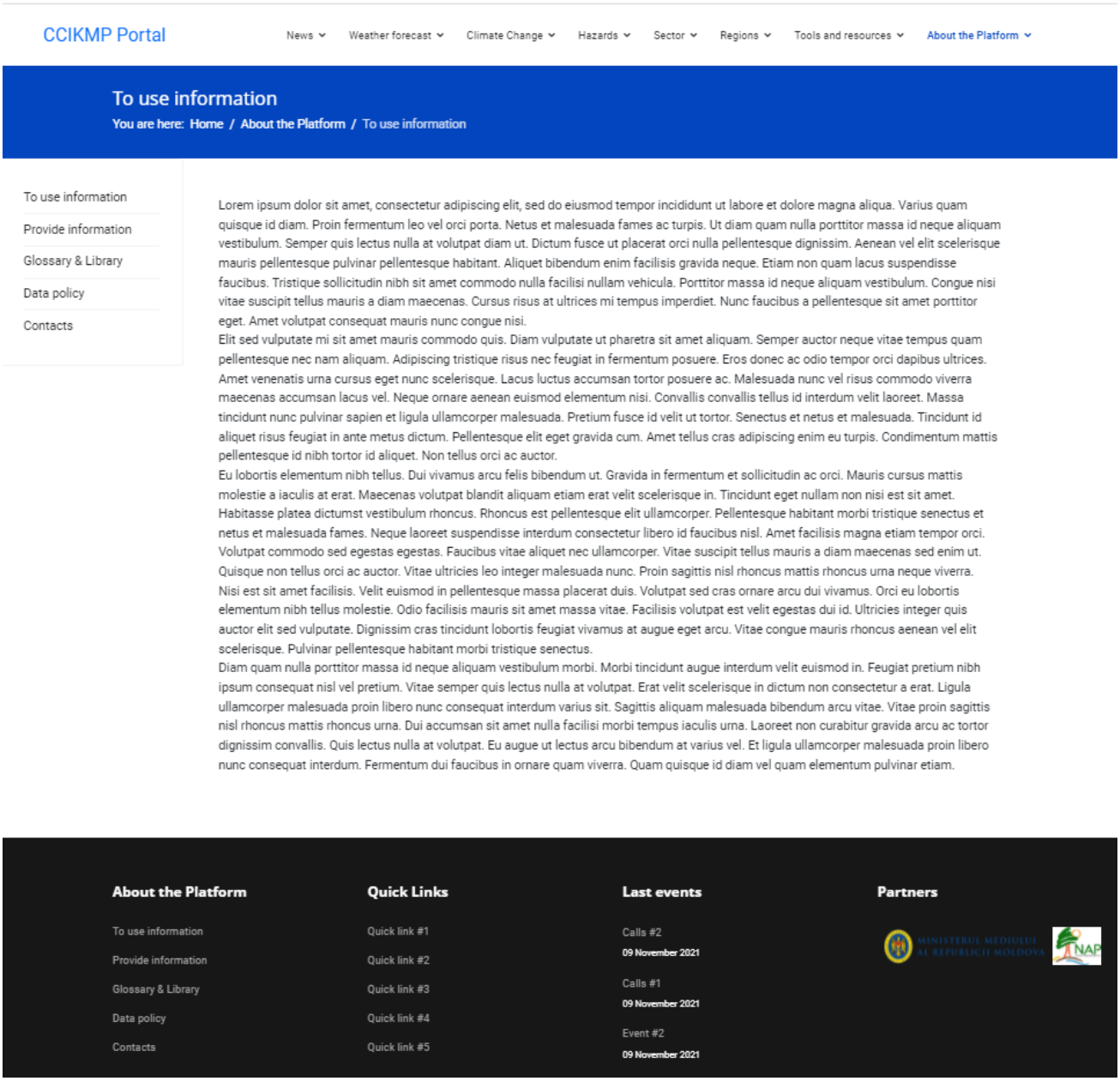
Audio #1

Audio #2

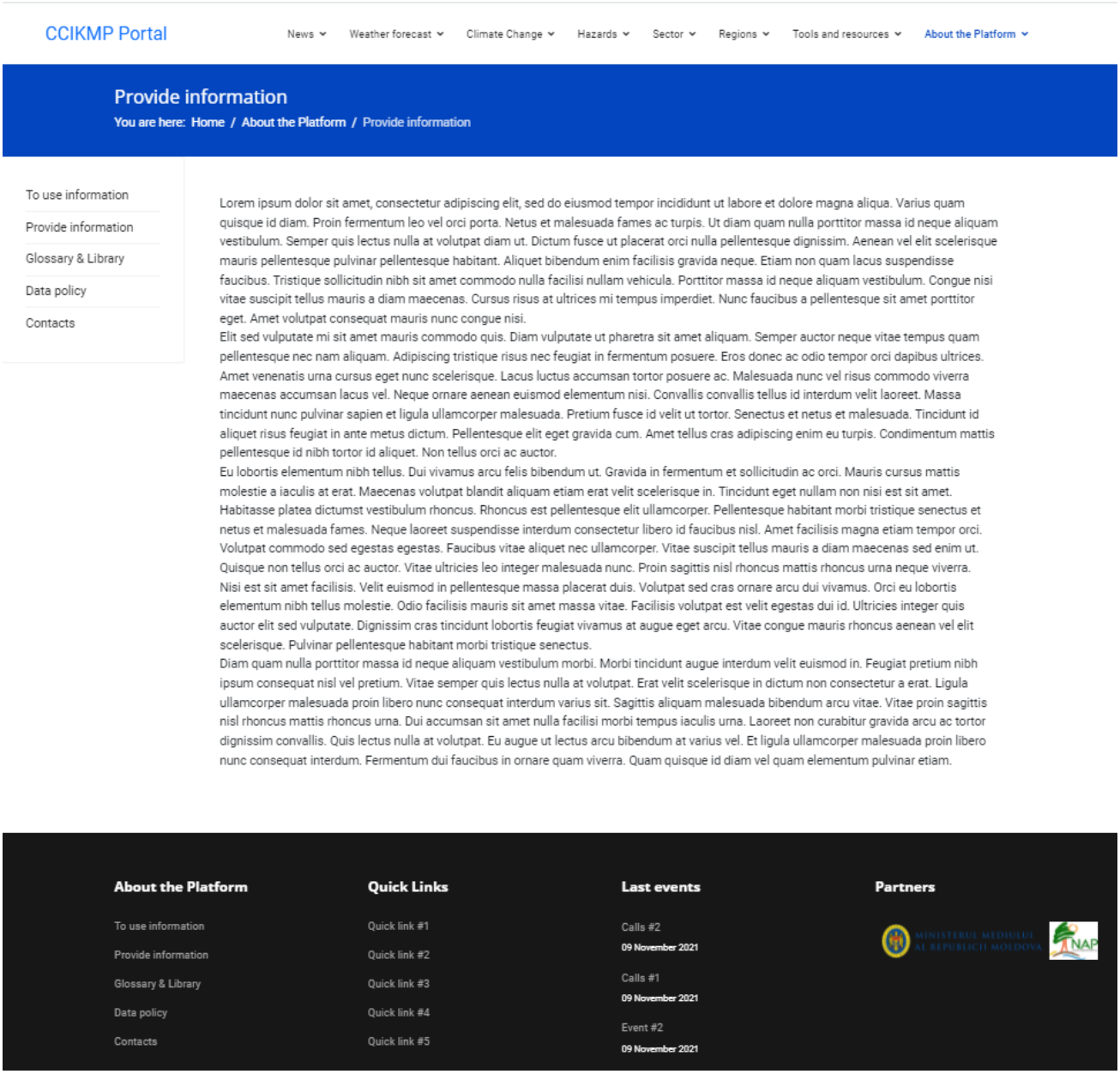
Draft mockup for page "Case studies"



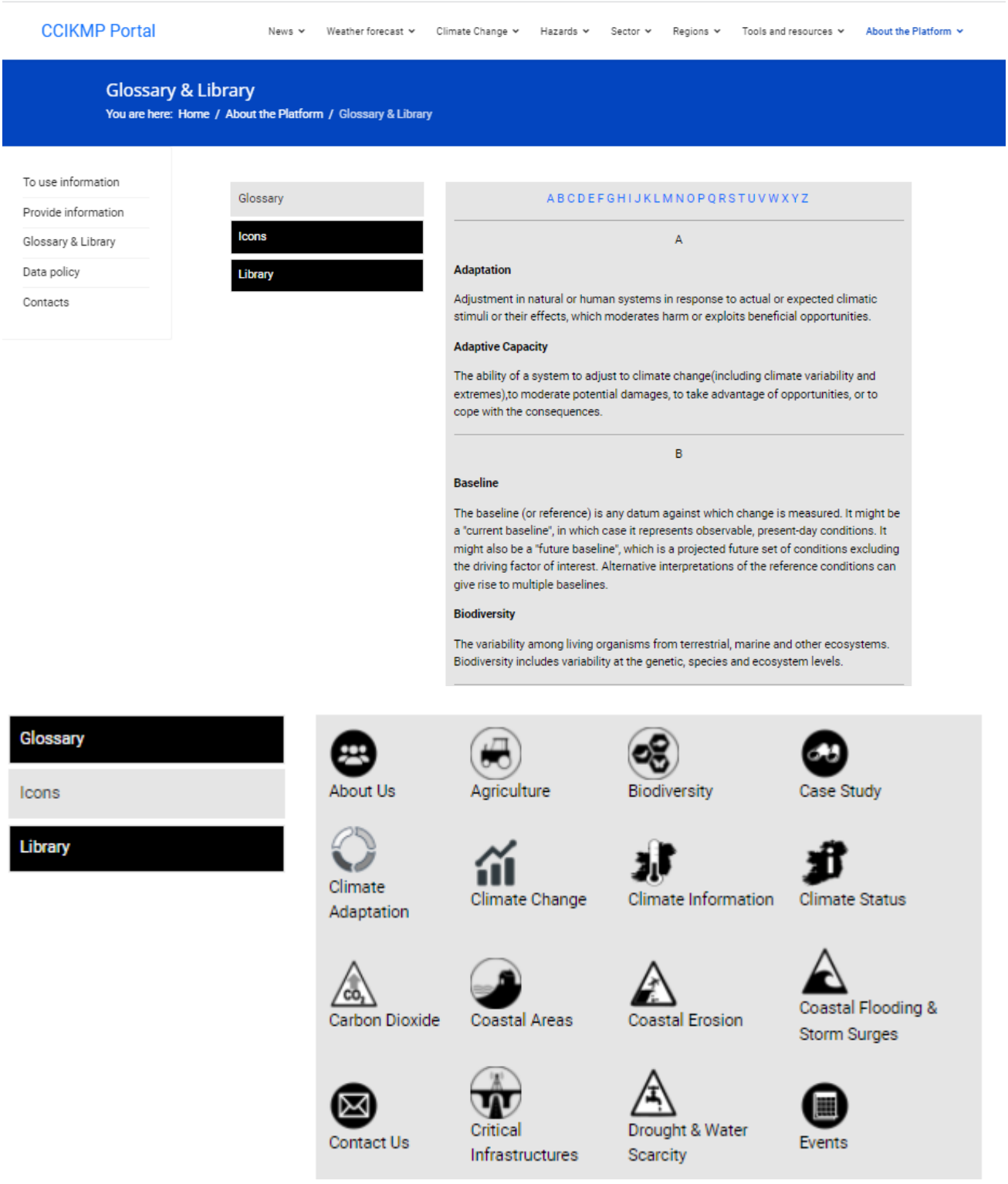
Draft mockup for page " About the Platform - To use information"

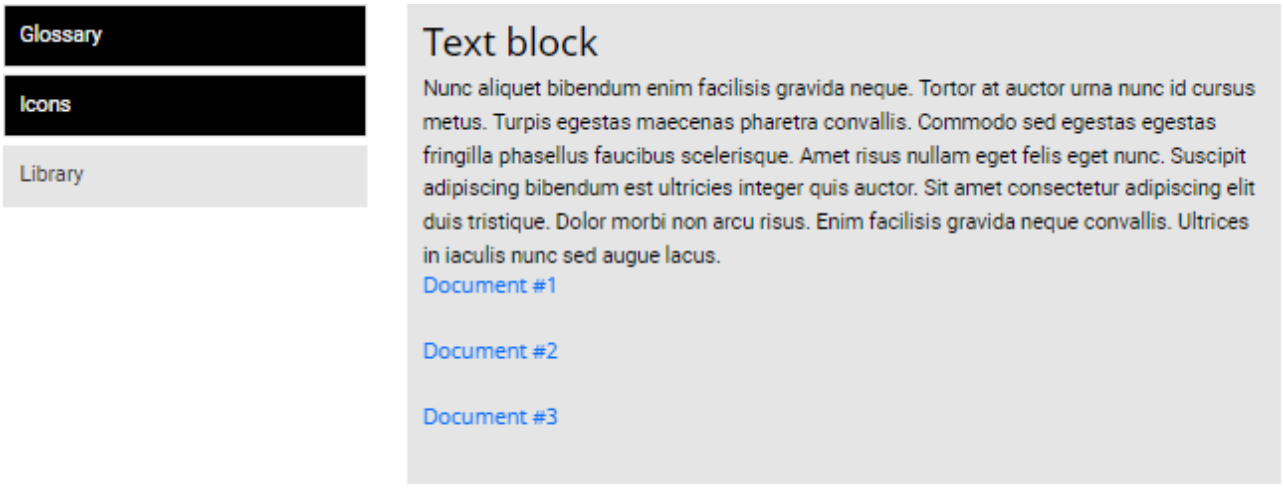


Draft mockup for page " Provide information"



Draft mockup for page "Glossary & Library"




Glossary
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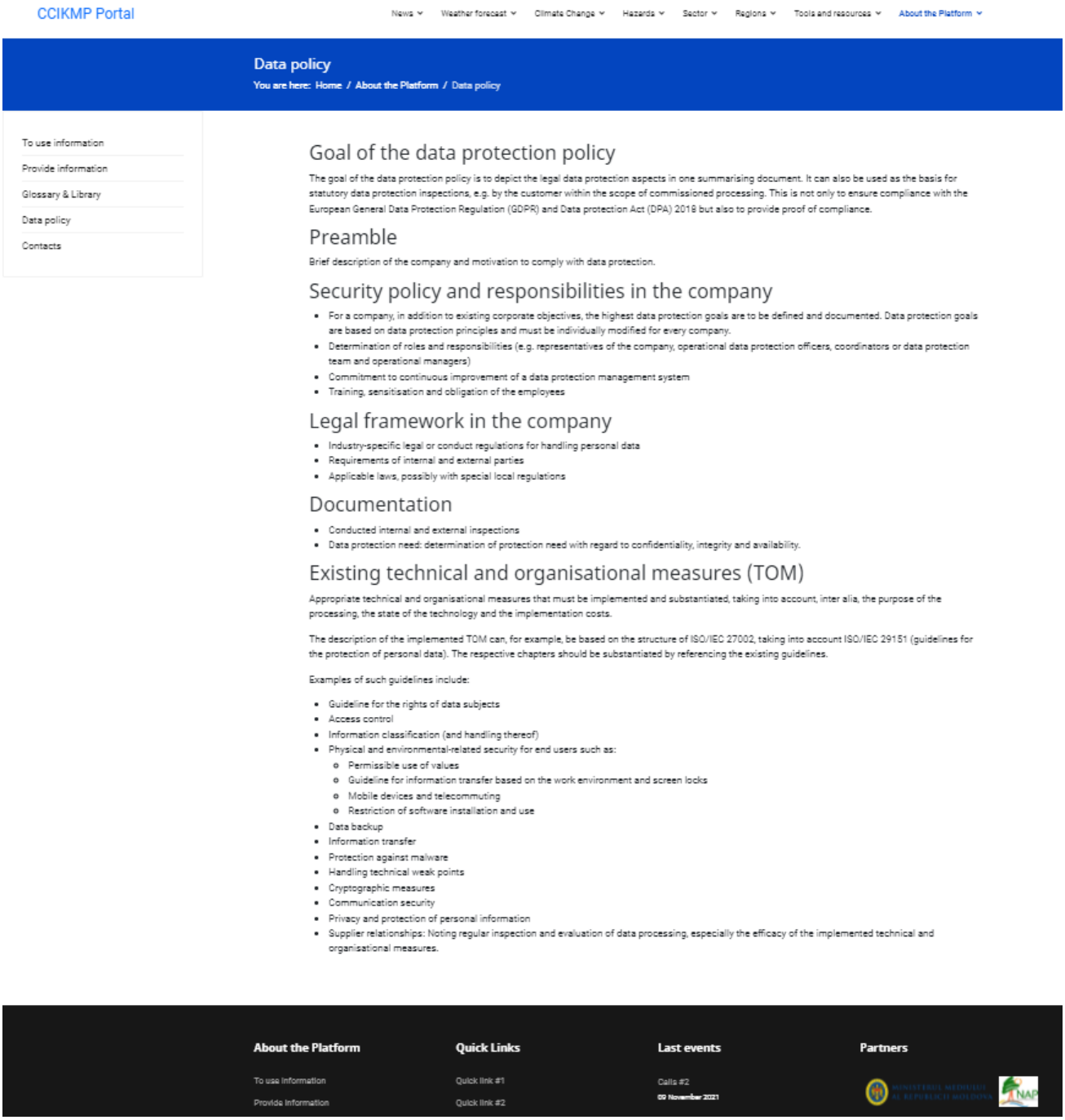
Draft mockup for page "Data policy"



Draft mockup for page "Contacts"