A PROPOSAL FOR A KNOWLEDGE MANAGEMENT FRAMEWORK AND ACTION PLAN FOR CLIMATE CHANGE RESPONSE IN CAMBODIA FOR THE DEPARTMENT OF CLIMATE CHANGE (GSSD/DCC)

PART 3
FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS SPECIFICATION FOR THE KNOWLEDGE PORTAL ON CLIMATE CHANGE

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1.   INTRODUCTION

The Department of Climate Change (DCC), General Secretariat of the National Council for Sustainable Development (GSSD), is establishing a Climate Change Knowledge and Information reference of excellence in Cambodia supporting the main stakeholders from government, private sector, civil society, research and academia, media and development community working on climate change (CC) adaptation and mitigation in Cambodia.

The Department will bring together the existing expertise, climate change related datasets information and knowledge required for the climate change response services in Cambodia. It will reinforce existing channels of knowledge and information sharing with an online Climate Change Knowledge Portal, building upon the current CamClimate website. The CamClimate Knowledge Portal will be managed by a dedicated KM Team within DCC and will support the management and exchange of quality-assured data, information and knowledge on climate change and climate change response in Cambodia.

This proposal will describe a Knowledge Management Framework (PART 1) and a KM Action Plan (PART 2) to support the implementation of the Knowledge Management (KM) activities in the coming 3 years in Cambodia including the development and implementation of the new CamClimate Knowledge Portal for which functional and non-functional requirements have been elaborated (PART3).

The current document (PART 3) describes the functionality of the Knowledge Portal for Climate Change supporting the key stakeholders in the climate change response in Cambodia. The present functional and non-functional requirements for the K Portal take in consideration the user needs of the key stakeholders, as identified in the e-Survey and the interviews held with selected stakeholders and provide the basic requirements for the design of the K Portal.

2.   KEY APPLICATION AREAS FOR KM

Information and Knowledge Needs

Based on a consultation of the key stakeholders in climate change in January 2016 (by e-survey and meetings with key stakeholders in Phnom Penh, the following information and knowledge products were identified as the most needed by the key stakeholders in Cambodia (see also Annex 1 for the key results of the e-Survey):

1. Information on existing datasets on Climate Change
2. Information on organizations, institutions and companies working on climate change in Cambodia
3. Information on climate change projects on climate change response in Cambodia
4. Information on organizations, institutions and companies working on climate change in Cambodia
5. Publications and reports on Climate Change (Response)
6. News and events on Climate Change Adaptation and mitigation in Cambodia
7. Information on sources of funding for climate change response
8. Climate scenarios for Cambodia
9. Training materials on climate change (response) for various sectors (specify sector in textbox)

The e-Survey also revealed that the respondents wish to use online systems and tools more in the future, including specifically the CamClimate website.

Most of the above information is spread over organizations, institutions and development partners in Cambodia in online and often in offline 'collections. A lot of information will be in Khmer, while some of the information may also be available in English.

A large number of (global) Climate Change websites and portals are already available at the Internet (see Annex 2). Where possible linkages and collaboration will be established with key web resources relevant for the work on climate change in Cambodia.

Policy Development, Planning and Programme Management

For KM activities focusing on policy development, planning and programme management for climate change, initial KM activities will focus on the web-base GIS mapping of key indicators and the M&E indicators on impact of climate change response.

Subsequent development and implementation of new KM tools for this function will depend on the progress of the KM activities in the first 1-2 years and the needs of the key stakeholders involved in these activities. The development of these tools is not part of the current functional design. Additional tools to be included in the future may be planning tools such as scenarios analysis software, trend analysis, scenario models.

Collaboration and Communication

The **K Portal** requires a proper design and development of online '***work spaces'*** that stakeholders can use for their work. At these online '*collaboration areas'* at the portal stakeholders can invite other partners and stakeholders to discuss, collaborate and develop information and knowledge products for CCR. Initially in year 1 the activities will be limited to a few pilots to showcase the collaboration functionality at the portal. Several stakeholders already showed interest to participate in these pilots. In the future also thematic communities of practice can be set up based on priority sectors or specific topics where registered users can get information and knowledge dealing specifically with their own sector.

Communication activities to raise awareness and communicate on climate change and climate change response to the general public and key other target groups (e.g. vulnerable groups) are being developed making use of the key information and knowledge products brought together at the K Portal in collaboration with stakeholders with specialized communication expertise and experience. When feasible collaboration work spaces will be used to prepare new communication products.

Learning and Innovation

Tools to share, develop, capture, discuss, use and share resources for Learning & Innovation: Lessons Learned, New Technologies and Good Practices. The KM Approaches for 'Learning and Innovation' (Application area 4) will initially use the functionality developed for the area 1 (IM) and 3 (Online Collaboration).

Any additional functionality will be developed and incorporated into the K Portal at a later stage in year 2 or 3, when required and needed by the stakeholders, and is not part of the current functional requirements. As the KM activities linking to learning and innovation are complex, any new tool will be introduced with proper training and facilitation in order to promote and support the use of the new functionality, e.g. e-learning platform and innovation tools.

3.   REQUIREMENTS FOR THE KNOWEDGE PORTAL

Existing (ICT) capacity with users

Users with different levels of ICT skills will be using the K Portal. This will require a *user interface (UI)* that is easy-to-use, even for users with less advanced ICT skills. In addition, the device choice of the users will be a key factor in the design of the K Portal. Most experts and practitioners are currently using their mobile phones as primary device for their work, although a number of them also using laptops and to a lesser extend desktop computers. The current technology developments will further increase the use of mobile phones and to a lesser extend tablets in favor of the use of laptops and desktops. This will add specific requirements for the K Portal.

Language – bilingual approach

Although English proficiency is growing and in the near future more and more people will be able to participate and collaborate in English at the K Portal, most stakeholders still advised on a bilingual K Portal, in Khmer and English. Smartphone and laptop/desktop interfaces of the K Portal will be available in the two languages, while the data (sets), information and knowledge will all be available in Khmer with the most important items also availbale in English. For the information not availbale in English at the K Portal, an automatic translation function can be provided for a 'rough' translation.

Usability

The users determine whether the K portal will be a success or not, so it will be important to keep it simple by creating a functional easy-to-use front-end (user Interface), and, where necessary, to build the advanced technical functionality at the back-end e.g. an advanced search engine and/or use of thesaurus for easy search and retrieval. The devices currently used to access the Internet in Cambodia are predominantly mobile phones. This will require a well-designed *responsive* user interface which will properly present the information depending on the device used with special attention to an easy-to-use interface for mobile phones.

Flexibility

The software package used for the network and information portal should be flexible that additional functionality can be added when required by the users. With as other requirement, the use of an open source CMS, a number of CMS packages can be used with Drupal 7 as one of the most suitable options. Modularity is seen as a key characteristic for the K Portal design. The principle for development will be 'not to re-invent the wheel' and to use, as much as possible, suitable distributions already available (see Annex 2)

Access Control System

The network portal needs to have a simple, but robust access control system that will manage access to the content stored at the network portal and the Information Portal for different user groups. An access control system is required with different levels of access for general public (no login and registration needed), registered users, information and workspace managers and portal administrators.

Personalization

Recognizing the importance of providing specific information to different users based on their preferences a 'personalized (user) dashboard' will be important where an individual user can subscribe to specific information and build up a personal library of selected content, and link to specific experts and colleagues. A personal profile (member page) can be used by the experts to present their own expertise at the K Portal.

Navigation

Well-designed navigation options need to be available to facilitate the use of smaller devices such as mobile phones and tablets. The application of maps for easy navigation and selection of information to be displayed is a standard functionality for the information and knowledge portals. Geo-referenced data for specific information items can included in the information captured for experts, organizations, resources and solutions in the network and information portal. This will allow use of maps as a navigation option. This mapping functionality can be easily added to a CMS as Drupal7.

4. DEVELOPMENT OF THE KNOWLEDGE PORTAL

Scope

The current functional requirements for the K Portal will focus on the basic functionality to manage the key information. The K Portal is not replacing existing systems and tools of other stakeholders dealing with climate technology innovation, but will try to establish linkages with these other web resources to exchange information ad knowledge where feasible. The online work spaces of the K Portal are a key functionality that will be developed as part of this new K portal. Another key functionality to be developed now will be web-based GIS functionality for mapping key indicators on climate change (response).
In addition, a changing context and new challenges in the field of climate change adaptation and mitigation may result in new activities to cope with and find solutions for these challenges. This may require new functionality for the K Portal. The new tools are to be developed in the future and are not part of the current development of the K Portal for Climate Change.

Users of the K Portal

The key users of the K portal will be the experts, practitioners and support staff of DCC and other stakeholders working on climate change and general public in Cambodia. The stakeholders will have

different roles and responsibilities. The proposed basic functionality of the K portal will be available to all users. The general public will mainly use the CamClimate website

Administrators

In order to support and facilitate the network and information portal, different support structures need to be in place at the DCC and stakeholders, e.g. (1) *information manager(s)* responsible for initial data entry and at a later stage support and quality control of the data entry by users, (2) *administrators* for the K Portal management and maintenance.

5.   FUNCTIONAL REQUIREMENTS SPECIFICATION

Software Choice for K Portal

The K Portal will be built with a flexible CMS of Framework Software. By using a well-developed CMS of framework package in combination with existing modules and distributions such as *Drupal CMS* and not built the K Portal from scratch will reduce the development time and keep costs for development of the K portal as low as possible. There are specific Drupal distributions, that already have specific modules added to provide extra functionality. These distributions can be used by the consultants to easily develop specific functionality in the K portal.

Hosting

Minimum IT requirements for a Drupal CMS website (or any comparable CMS software) are:
Disk space: minimum installation required for a website with many additional modules and themes installed: 100MB. And for the additional storage of documents 1GB for the first year, and each following year 0.5 - 1GB extra (depending on the #of documents submitted by the stakeholders.
Web servers: Apache (recommended and most supported) or Microsoft IIS.
Database: MySQL 5.0.15 (recommended and most supported) or PostgreSQL 8.3 or higher
PHP: PHP 5.4 or higher recommended
Hosting of a website with above requirements will cost about 500 US$/year at a dedicated web server in the Netherlands.

Data Specification – Main Entities of the K Portal

The K portal will work with a limited number of entities and capture information on experts, organizations, resources, projects and solutions (lessons learned, case studies, good practices, and examples of technologies).

Table 1: Overview of the main entities to be included in the K Portal

PROPOSED ENTITY	DESCRIPTION
EXPERT	
User	Information (Profile) on the registered user with contact details and expertise
ORGANIZATION	

Organization	Company/Institution/Organization with a legal status Organizations may have a hierarchical structure.
RESOURCE	
Resource	'Knowledge Resource' such as report, publication, project profile, article, blog, bookmark to web resource, photo, video, News item, Event
PROJECT	
Project	Activity with start and end date
SOLUTION	
Solution	Knowledge products, e.g. Lesson learned, Case studies, Good Practices, Technologies, Methodology, Business model etc.

In table 1 (above) an overview is given of the proposed entities for the information items to be included in the K Portal and a description of the content types.

Links

Links between the main entities is an important functionality to capture the relationships between the information items. There may also be hierarchical links ('parent-child') between two of the same entities, e.g. an organization may have sub-units.

Table2. Links (Roles) for the main entities

CONTENT TYPE	Expert	Organization	Resource	Solution
Expert	Person can have colleagues	Role of a person in org.: Manager, Staff member;	Role of a person: Author, Co-author Publisher	Role of a person: Author, Owner, Publisher
Organization	Organization can have personnel	Hierarchical Links: Parent Organization Sub-unit	Role of an organization: Producer/author Publisher	Role of an organization: Producer/ author Publisher
Resource	Publication can have 1 or more authors	Resource can be links to 1 or more organizations	Hierarchical Links: Book with articles (parent – child)	Role of resource: e.g. Report on Solution
Project	Project has project staff	Project has organizations participating in activities	Project produce reports	Project produce Solutions
Solution	Solution can have one of more owners/ describers	Solution can be linked to 1 or more organizations	Solution can be described in a publication	A Solution can be the source or follow-up of another Solution

Reference Tables and Taxonomy Lists

The above main entities have reference tables and taxonomy list to be able to groups experts, organizations, resources and solutions. An overview is given below in table 3.

Table 3. Reference tables and taxonomy lists

ENTITY	REFERENCE LIST
EXPERT	*Sector* *Adaptation solution* *Mitigation Option* *CC Adaptation and Mitigation Research Area* *Location (province)*
ORGANIZATION	Legal status Type of Organization Scope *Sector* *Adaptation solution* *Mitigation Options/Solution* *CC Adaptation and Mitigation Research Area* *Location (province)*
RESOURCE	Type of Resource Type of media *Sector* *Adaptation solution* *Mitigation Options/Solution* *CC Adaptation and Mitigation Research Area* *Location (province)*
Projects	Type of project Status (planned, ongoing, finished) *Sector* *Adaptation solution* *Mitigation Options/Solution* *CC Adaptation and Mitigation Research Area* *Location (province)*
SOLUTION	Type of solution *Sector* *Adaptation impact* *Mitigation Options/Solution* *CC Adaptation and Mitigation Research Area* *Location (province)*

In tables 4a-e five (optional) taxonomy lists are given that may be used for entities at the K Portal:

1. Sector
2. Adaptation solution
3. Mitigation Options/Solution
4. CC Adaptation and Mitigation Research Area
5. Location

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Table 4a. Sector list (draft list to be completed)

Sector
1. Agriculture and water
2. DRR and social protection
3. Education
4. Energy and mines
5. Environment
6. Forestry
7. Fisheries
8. Gender
9. Health
10. Industry
11. Infrastructure
12. Land management
13. Rural development
14. Telecommunication and ICT
15. Transportation
16. Tourism
17. Water and rural development

Table 4b. Adaptation Solution for

Adaptation Solution for
1. Agriculture
2. Forestry
3. Fisheries
4. Coastal Resources
5. Human Health
6. Transportation
7. Water Resources
8. Disaster Risk Management (DRM)
9. Crosscutting Technologies

Table 4c. Adaptation Solution for

Mitigation Adaptation option for
1. Energy Industries
1. Manufacturing Industries and Construction
2. Transport
3. Commercial/Institutional
4. Residential Sector
5. Agriculture

Table 4 d. Key climate change adaptation and mitigation research area

CC Adaptation and Mitigation Research Area
1. Climate resilience of food production systems
2. Policy relevant health risk assessment
3. Role of social protection and early warning schemes
4. Community/ecosystem based adaptation;
5. Assessment of adaptation technologies
6. Quantifying ecosystem services
7. Low-cost, low carbon, appropriate technologies for energy, industry and waste management
8. Decoupling development from carbon – reducing uncertainties in estimating national emissions and removals of greenhouse gases
9. Improving activity data and emission factors for the key sources
10. Land use planning in climate change adaptation and mitigation responses
11. Low carbon urban resilient development

Table 4 e. Location

Provinces in Cambodia
Batdambang
Kampong Cham
Siem Reab
Kampong Thum
Pouthisat
Kampong Spoe
Prey Veng
Kampong Chhnang
Takev

Kampot
Banteay Mean Cheay
Kandal
Kracheh
Kaoh Kong
Svay Rieng
Stoeng Treng
Mondol Kiri
Preah Seihanu
Preah Vihear
Rotanah Kiri
Otar Meanchey
Krong Phnum Penh
Pailin
Keb

Details of Main Entities

EXPERT

A User profile will be the 'public' presentation of a registered user at the K portal. The User Profile will have a number of metadata fields with a few of these fields being required fields (indicated with an *). Key *metadata* fields for the Expert entity are given below in Table 5. In addition links with other entities and taxonomy lists are given.

Table 5: The proposed fields for the 'USER Profile'

Fields (Metadata) * required	Relations & Taxonomy lists
PERSONAL AND CONTACT DETAILS Name * Gender (Male/Female) * Email * Profile Picture Mobile number Skype name Bio data (*About me*) (text) Expertise (text) Other: Phone/Fax Social Media (Links to LinkedIn, Twitter, Facebook) Language (English & local languages)	Relation: 1. Link to Organization 2. Link to Resources 3. Link to Project 4. Link to Solutions Taxonomy lists: 1. *Sector* 2. *Adaptation solutions* 3. *Mitigation Options/Solutions* 4. *CC research areas* 5. *Location (province)*

ORGANIZATION

The entity 'Organization' is proposed for information on the organization/institution/company. The entity 'Organization' has a limited number of metadata fields, links to other entities , reference tables, taxonomy lists and geo-reference data (for mapping) (Table 6, 7, 8 and 9).

Table 6: Proposed Content type 'Organization'

Organization	
Fields (Metadata) + Reference lists	**Relations & Taxonomy lists**

1. Full Name of organization (*)
 2. Acronym
 3. Email*
 4. Mobile nr*
 5. Address
 6. Province
 7. Country
 8. Website (URL)
 9. Summary description
  Legal status of organization -Table 7
  Type of Organization - Table 8
	Links:
	　1. Link to Persons
	　2. Link to Resources
	　3. Link to Solution
	
	 Taxonomy lists:
	
	　1. *Sector*
	　2. *Adaptation solutions*
	　3. *Mitigation Options/Solutions*
	　4. *CC research areas*
	　5. *Location (province)*

Table 7. Reference list 1 for entity Organization

Legal status
• Government   • Civil Society   • Private Sector   • International Organization

Table 8. Scope (more than one option possible)

Legal status
• Global – International   • National   • Sub-national   • Local

Table 8. Reference list 2 for entity Organization

Type of Organization
• Community-based Organization
• Credit and micro-credit institution
• Donor agency
• Financial institution
• Government institution
• Investor
• International development agency
• International NGO
• Large enterprise
• NGO
• Research Institution
• SME
• University

RESOURCE

For publications, reports, project profile etc. the entity 'Resource' is proposed with a number of metadata, (see Table 10). Additional tags can be added in selected vocabularies in order to capture new topics and trends.

Table 10. Proposed entity 'Resource'

Resources		
Resources	**Reference lists and taxonomy lists**	**Links**
Different resource types: *e.g. File; News item; Bookmark (URL); Blog a=item; Event; wiki etc* **Metadata** 1. Title (*) 2. Short Summary 3. Description 4. Document Status 5. Country	**Ref. list:** 1. Type of Resource 2. Multimedia type Taxonomy lists: 1. *Sector* 2. *Adaptation solutions* 3. *Mitigation Options/Solutions* 4. *CC research areas* 5. *Location (province)*	1. Link to Persons 2. Link to Organizations 3. Link to Projects 4. Link to Solution

The Reference List 'Multimedia Type' (Table 11) will indicate the type of media, e-document, images, audio or video file.

Table 11. Proposed list for 'Media type'

Resource - Media Type
1. E-document (in pdf, Word, excel etc.)
2. Audio
3. Image
4. Video

The draft reference list 'Type of Resource' (Table 12) can be used as basis for categorizing the 'resources'. Table 13 gives a list of policy and program/project documents.

Table 12. 'Type of Resource' (draft list)

Type of resource	
Announcement	Partnership Agreement/MOU
Annual Report	Policy document
Brochure	Poster
Case Study	Presentation
Data set	Press Release
Educational Material	Programme/Project document
Form/Template	Publication
Guideline/Toolkit/Manual	Report
Leaflet	Speech
Map	Social media
Meeting Document	Statistics Report
Memo	Treaty/Convention
News article	Website Post
Newsletter	

Table 13. 'Type of Policy and type programme/Project documents (draft list)

Type of policy document	Type of Programme document
Problem identification report	Change Management report
Agenda setting report	Programme/Project document
Policy Strategy	Programme/Project identification report
Policy Framework	Programme/Project planning document/LogFrame
Policy Action Plan	Programme/Project formulation
Policy M&E report	Programme Project plan
Impact Assessment Report	Programme/Project document
Policy brief	Programme/Project action plan
Fact sheet	Programme/Project progress report
	Programme/Project budget
	Programme/Project M&E report
	Programme/Project Score card
	Programme/Project status report
	Programme/Project Closing report
	Risk Management report

SOLUTION

Information on Solutions deal with a range of knowledge items such as lessons learned, good practices and technologies. The entity 'Solution' is proposed with a number of metadata (Table 14) and a reference table for Type of Solution (Table 15).

Table 14. Proposed Entity 'Solution'

SOLUTION		
Metadata	**Reference tables and taxonomy lists**	**Links- roles**

1. Title of Solution
2. Summary of Solution
3. Description of Solution
4. Published /Not published
 	
Upload File (document, images, video)
	Ref. list:
	Type of Solution
	
	Taxonomy lists:
	   1. *Sectot*
	   2. *Adaptation solutions*
	   3. *Mitigation Options/Solutions*
	   4. *Sector*
	   5. *Location (province)*
		1. Link to Expert(s)
		2. Link to resources,
		3. Organizations
		4. Related Solutions

Table 15. Reference table for entity 'Solution' (draft list)

TYPE of Solution
1. Experience, story
2. Case study
3. Lesson learned
4. Good Practice
5. New methodology
6. New technology
7. Innovative product
8. Innovative service
9. Innovative process
10. Business Model

Work space as collaboration entity

'Work space' is an online working area within the K Portal, where experts and practitioners can share knowledge and information, collaborate and interact and discuss with each other for project work, workshop, committee work etc.

Spaces have their own metadata and 2 reference tables (Space access - *public/private)* and Type of Space (*Organization/Thematic)* (see Table 16).

Work spaces are managed by an administrator who is also the owner of the work space. A Work space will have members (registered users) that participate in work carried out at the space. All members are able to add and share content (optionally moderated by a space facilitator). As people work together in different activities, thematic areas, geographic areas, it will be necessary to provide a clear overview of the existing spaces. This shall be facilitated by the links to the other entities.

Table 16. Entity 'Space'

SPACE		
Metadata	**Reference tables – Geo-ref - Taxonomy**	**Links- roles**
1. Name of Space 2. Description of Space and welcome message	Space Access *(public or private)* Type of Space *(Organization/Thematic)*	1. Experts (members) 2. Link to resources 3. Organizations 4. Projects, 5. Solutions 6. Related Spaces 7. Link to discussions (Space has # of discussions)

Discussion

Discussion is an online interaction activity to be used within a 'Work space'. Members of a workspace pace can interact and discuss at the discussion forum a specific topic, event, project etc. Metadata (text fields), actions possible at a discussion forum, and links to entities are given in Table 17.

Table 17. Proposed Entity   'Discussion'

DISCUSSION	
Metadata	**Links**
1. Title of discussion 2. Description (text) 3. Owner of discussion (member that started discussion)	1. Link to a SPACE 2. Link to related Space **Actions available for Discussion:** Add a post/comment to the discussion Cross-post Discussion to another (public) space

Access

The K Portal needs to be built with a CMS software system that allow multiple users to simultaneously access the portal. A public section of the K portal (the CamClimate website) will provide general information on the Climate change and Climate Change response in Cambodia. Staff of all stakeholders can become a registered use. The restricted access section of the K Portal will provide registered users with a number of supporting tools to carry out their work and collaborate with other stakeholders and upload and update information and Knowledge (I & K) products to the portal.

Higher access levels should be available for Information managers, KM facilitators and Administrators. The CMS software should allow the set-up of these access levels for registered users, information managers and administrators.

Registration

The Registration procedure should be an easy process allowing unregistered users to register at the web portal with their name, email and a limited number of required fields. Administrators will subsequently check the registration, using predefined guidelines for registration prepared by the KM Team and approve or reject the registration. A rejected registrant may receive an email with the request for additional information, in case not enough information is available to approve the registration.

After the approval by the administrator the registrant will receive a welcome email with the confirmation that the registration has been approved, and any additional support information to get started. Registered users will be able to access the restricted sections of the K portal and use the available system and tools.

User Interface

Information Management Tool – add, update, delete information items
The IM Tool at the K Portal will allow registered users to add information to their own user profile and add additional I & K products, e.g. publications, reports, project profiles, information on their own company or organization, solutions, and/or news and events to the K Portal.

A registered user will be able to update or delete only information at a later stage that he/she added to K Portal. Information items can at a later stage be made available at the overview page (personal dashboard) of one or more 'work spaces' at the portal. In addition work space owners will have the right to change and /or delete I & K Products based on pre-defined guidelines for quality control.

Search and Retrieval
The Search and Retrieval functionality of the K portal will be an essential tool for easy access to resources stored in the portal. Full text indexing of the uploaded resources combined with semantic search functionality needs to be available to provide users with a tool to quickly find specific information. There are a number of full indexing, semantic tools and selection of the tool will depend on the choice of the CMS software/framework for the information and network portal.

An important tool for aggregation of information at the information portal will be the *taxonomy* lists for sector, and adaptation and mitigation solutions, options and impacts, and the location list. Information will be brought together based on these lists.

In addition, an alternative tool to aggregate resources is the use of a *thesaurus* for an automatic assignment of climate change keywords to a specific resource. In this respect the REEGLE thesaurus may be an interesting tool that can be considered to be integrated into the information portal. For more information see www.Reegle.info.

Navigation
Navigation is another key tool for users to quickly find the information they are looking for at the K Portal.

The following elements of the user interface facilitating the navigation at the portal need ample attention:

- Easy-to-use menus for searching for information and adding specific information placed at consistent locations at the user interface with proper attention to the smaller screens of smartphones and tablets
- Maps with geo-referenced information for e.g. presenting technologies by sector on maps.

Additional functionality at the UI for users
1. **Rating Tool** for rating of solutions described and uploaded by registered users. In order to provide users with information on the quality of the submitted solution there may be set up an independent expert panel to evaluate the solutions plus in addition a general user rating by registered users.
2. **Pushing Tools**
   - *e-Alerts* - Pushing content to users who are most likely to use it - email alerts when a new resource or solution has been added.
   - *What's new button* that displays recently added content
   - *e-Alerts for quality control* - alerts to Information Managers of new submissions of resources.

Additional functionality at UI for ADMINISTRATORS

Statistics Tool for M&E on use of the portal to be used by administrators: Logs / reports for number of contributions, number of hits per repository / sub-repository, number of views / downloads per knowledge submission, details (name and dates) of employees visiting the portal, who has read / downloaded which knowledge-object, etc.

Web-based GIS Functionality

Mapping functionality can be set up in CMS software such as Drupal (see Annex 2), either by using a Drupal distribution or by using OpenLayers or GoogleMap, fairly easily and should be availbale for e.g. simple mapping of project locations.

However, when you need GIS for more advanced online analysis and mapping (dynamic maps) , it is best to develop this functionality outside the CMS and the best option is the develop this GIS functionality outside the CMS software, but display and use the functionality within the K portal.

Two options for web-based GIS functionality are available (excluding the option of licensed ARCGIS):

1. Cloud-based GIS such as MangoMaps (mangomaps.com) – with different pricing options (combined with offline QGIS)
2. Open Source GIS such as QGIS (QGIS.com) with GEOServer and develop own web-based GIS.

The cloud option does not have extra IT requirements as it will use the IT architecture of the cloud provider. The second option (E.g. QGIS + GeoServer) will require more RAM Memory (min 8 GB) at the server, so it will increase the costs of the web hosting of the portal (4GB RAM extra will cost some 600 US $ extra).

6.   ADDITIONAL OTHER REQUIREMENTS FOR THE INFORMATION PORTAL

A number of non-functional requirements important for the technical design of the K Portal are discussed below.

The non-functional Requirements are dealing with:

1. **Function of the K Portal**: Usability, Security and Reliability
2. **Performance of the K Portal**: Efficiency, Interoperability
3. **Future changes of the K Portal**: Maintainability, Flexibility and Expandability

Function of the K Portal

1. **USABILITY**

   1. Well-designed user interface with the following tools:
      - Simple instructions at screens when action is required from the user
      - Precise and constructive error messages for users (preferably with links to manuals)
      - User manuals for the key activities to be done at the K Portal (related to information management)

- Online Helpdesk with additional FAQ section at K Portal to support users.

2. SECURITY

1. CMS Software choice – secure software with regular updates
2. Regular updates of CMS software and of additional modules or tools installed
3. Regular backup of the complete CMS system whenever updates have been made and at regular intervals (once a week)
4. Regular back-ups of system database every 24 hours on a server at a secure location
5. No unauthorized access to the K Portal based on access permissions only to be changed by system administrator
6. Secure access management and user identification system.

3. Reliability

1. Speed of operation
   - Response times – screens should load relatively quickly (within seconds)
   - Availability: 24-7 (99%)
     (Availability is strongly depending on other factors such as power cuts and internet disconnection and internet bandwidth)

Performance of the K Portal

1. Efficiency
1. Resource utilization – K Portal should be able to run on different devices (mobiles, tablets, laptops and desktops) using one of the modern internet browsers (Chrome, Firefox, Safari and Internet Explorer) and using quickly loading templates for the different devices.
2. INTERFACING WITH OTHER SYSTEMS
   1. Ability of the CMS software to interface with/use information/data from other information/knowledge systems (e.g. REEGLE thesaurus).

Future Changes of the k Portal

1. MAINTAINABILITY
1. The K Portal should be easy to maintain by selecting a high-quality CMS software system.

2. FLEXIBILITY
1. The CMS system used for the K portal should be flexible to add additional functionality at a later stage based on the needs of the users.

3. EXPANDIBILITY
1. The CMS system used for the K Portal should be flexible to expand its functionality by incorporating additional modules and/or components at a later stage.

Annex 1. RESULTS FOR E-SURVEY ON KM FOR CLIMATE CHANGE IN CAMBODIA

List of key stakeholders invited to participate in the e-Survey on Km for Climate Chang

STAKEHOLDER GROUP - INSTITUTION	
GOVERNMENT - national level	
1	NCSD
2	NCSD
3	NCSD
4	NCSD
5	MAFF/GDA
6	MAFF/FA
7	MME
8	MOWRAM
9	Ministry of Interior
10	MEF
11	MPWT
12	MoP
13	MFAIC
14	MoEYS
15	MoH
16	MRD
17	MoWA
18	NCDM
19	FiA/MAFF
20	Ministry of Information
21	Council of Ministers/Dept. Agriculture
22	Council for the Development of Cambodia (CDC)
23	Cambodia National Mekong Committee (CNMC)
24	MoC
25	Ministry of Industry and Handicraft
26	MLMUPC
27	Department of Animal Production and Health
28	NCDD-S
29	Forestry Administration
30	MoE/GDANCP
31	MoE/Coastal zone
GOV-Sub-national level	
1	Provincial Department of Environment, Kampong Cham province
2	Provincial Department of Environment, Pursat province
3	Provincial Department of Environment, Kampot
4	Provincial Department of Environment, Battambang
5	Provincial Hall of Preah Sihanouk

14	Save the Earth Cambodia (STEC)
15	Oxfam Cambodia
16	Catholic Relief Service (CRS)
17	Children Development Association (CDA)
18	National Prosperity Association (NAPA)
19	My Village (Mvi)
20	Khmer Farmer Association (KFA)
21	Nak Akphivath Sahakum (NAS)
22	Building Community Voice (BCV)
23	Youth Resources Development Program (YRDP)
24	Cambodia Community Development (CCD)
25	Action for Environment and Communities (AEC)
26	East West Management (EWMI)
27	Caritas Cambodia
28	DanChurch Aid/Christian Aid (DCA/CA)
29	Save Cambodia's Wildlife
30	STAR Kampuchea
31	Highlanders Association- Ratanakiri
32	Srer Khmer
33	Live and Learn Environmental Eduction Cambodia
34	Southeast Asia Development Programme in Cambodia
35	Nexus Carbon for Development
36	Development and Partnership in Action
37	Community Resource Improvement for Development
38	People In Need
39	Action for Development (AFD)
40	Chetthor
41	The cooperation Environment Tourism Organization (CETO)
42	Community Resource Improvement for Development (CRID)
43	Neakpoan Organization for Development (NoD)

National NETWORKS/NGOs (continued)	
44	Sport and Agriculture Development Association (SADA)
45	Save Vulnerable Cambodia (SVC)
46	World Vision Cambodia (WVC)
47	Cambodia's Media Forum on Environment (CMFE)
48	Chamroeun Cheath Khmer (CCK)
49	Our Objective Organization (OOO)
50	Democracy resource centre for National Development (DND)
51	Peace Development Aids Orgnization (PDAO)
52	Green Vision Organization (GVO)
53	Cambodia Human Resource Development (CHRD)
54	Cambodia Community Development (CCD)
55	National Prosperity Association (NAPA)
56	Save the Earth Cambodia
57	Phum Baitong
58	Cambodia Research Center for Development (CRCD)
59	Conservation International (CI)
60	DHI
61	SPCR
62	National Biodigester Programme
63	Geres
64	International Institute for Rural Reconstruction
65	WCS
66	WWF
67	Birdlife International
PRIVATE SECTOR	
1	Chamber of Commerce
2	EuroChamps
3	Nexus Carbon for Development
4	SGFE - Cambodia (renewable energy/ biomass)
5	Acleda BANK (banking)
6	Solar Partners asia (renewable / solar)
7	Grandistimber (forestry)
8	IDE-Cambodia (agriculture)
THINKTANKS	
	Mekong Think Tank

RESEARCH INSTITUTES	
1	Cambodian Agricultural Research and Development Institute (CARDI)
2	Cambodia Development Research Institute (CDRI)
3	Learning Institute
ACADEMIA	
1	Royal University of Phnom Penh (RUPP)
2	Royal University of Agriculture (RUA)
3	Institute of Technology of Cambodia (ITC)
4	University of Cambodia (UC)
5	National University of Management (NUM)
6	International University (IU)
7	Prek Leap National School of Agriculture
8	University of Battambang
9	Mean Chey University
10	Chea Sim University of Kamchay Mear
National NETWORKS/NGOs	
1	NGO Forum on Cambodia
2	Mlup Baitong
3	Cambodia Climate Change Network (CCCN)
4	Women Organization for Modern Economy and Nursing (WOMEN)
5	Care Cambodia (CARE)
6	Partnership for Development in Kampuchea (Padek)
7	HelpAge International (HAI)
8	ForumSyd
9	Cambodian Center for Independent Media (CCIM)
10	Center de Development Agricol Cambogien (CEDAC)
11	Pact Cambodia
12	Women Organization for Modern Economy and Nursing (WOMEN)
13	The Asia Foundation (TAF)

INT NGOS	
1	PLAN INT.
2	OXFAM
3	CARITAS
4	HelpAge International
5	FORUMSYD
6	PACT
7	East West Management Institute
8	Southeast Asia Development Programme in Cambodia
9	People in need

INT DONOR & DEVELOPMENT AGENCIES	
1	UNDP
2	USAID
3	EU
4	DANIDA
5	UNEP
6	FAO
7	IFAD
8	SIDA
9	ADB
10	WHO
11	UNIDO

ACTIVE MEDIA	
1	The Cambodia Daily (Khmer & English)
2	Phnom Penh Post
3	Rasmei Kampuchea
4	Kampuchea Thmey
5	
6	Koh Santepheap
7	Daeum Ampel News
8	Fresh news
9	Bayon TV
10	CNC
11	CTN
12	SEATV
13	Hang Meas
14	Apsara TV
15	TV 9
16	NTV

List of organizations that filled out the questionnaire (in total 44 respondents).

Different staff members within one organization were requested to fill out the questionnaire, so some organizations are more than one time in the list.

Institution/Organization/company	Department (optional)
Nak Akphivath Sahakum	LNGO
National University of Management	
Community Resource Improvement for Development (CRID)	NGO
Partnership for Development in Kampuchea (PADEK)	
DCA/CA	
Council for the Development of Cambodia/ Cambodian Investment Board	Environmental Assessment
NGO Forum on Cambodia	
Learning Institute	
Save the Earth Cambodia	Climate Change and Disaster Risk Reduction (CC &DRR)
Action for Development (AFD)	N/A
CCCA	DCC
CCCA	DCC
CCCA	DCC
CCCA	DCC
CCCA	DCC - Result 2 Team
CCCA	DCC
Our Objective Organization (OOO)	CBO in Takeo Province
Mean Chey University	Faculty of Agriculture and Food Processing
Chetthor Organization	NECA
Cetthor Organization	NECA
Mean Chey University	Academic Affaire
Chetthor Organization	NECA
Ministry of Environment	DCC

Institution/Organization/company:	Department (optional):
NCDD Secretariat	Programme Management and Support Division - LG and Climate Change
Royal University of Agriculture	Center for Agricultural and Environmental Studies
National University of Management	
The Learning Institute	
Cambodian Center for Independent Media (CCIM)	Marketing
CCCA	DCC
The Cambodia Climate Change Network	
People In Need (PIN) Cambodia	Livelihood and Environment Program Renewable Energy
Women Organization for Modern Economy and Nursing (WOMEN)	Local NGOs
NUM	School of Graduate Studies
Institute of Technology of CAMBODIA	Research and Innovation Center
Women Organization for Modern Economy and Nursing (WOMEN)	N/A
Ministry of Health	Department of Preventive Medicine
Mean Chey University	Faculty of Agriculture and Food Processing
Mean Chey University	Faculty of Social Science and Community Development
Mean Chey University	Faculty of Agriculture and Food Processing
EU	Donor
WOMEN	NGO
Meachey University	Social science and community development
Institute of Technology of Cambodia	Research and Innovation Center
Forum Syd Cambodia	Programme Team - Environment and Climate Change

Section 1. General information on your organization

1. Type of organization/institution/company

	Response (%)	Responses
Government (national, sub-national, local)	30.77	12
Civil Society	33.33	13
Private sector	0.00	0
Academia	20.51	8
International donor/development agency	10.26	4
Local community/Community-based organization	5.13	2
Answered Question		39
Skipped Question		6

2. Main scope of you work

	Response (%)	Responses
Global	7.69	3
Regional (S.E. Asia)	2.56	1
National	53.85	21
Sub-national	17.95	7
Local	17.95	7
Answered Question		39
Skipped Question		6

3. How many staff members has your organization/institution/company?

	Response (%)	Responses
1-10	10.26	4
10-50	61.54	24
50-100	10.26	4
>100	17.95	7
Answered Question		39
Skipped Question		6

4. How many staff members in your organization have dedicated information/knowledge management, learning or innovation tasks?   (e.g. librarian, knowledge manager/coordinator, information manager, database manager, Community of Practice facilitator)

	Response (%)	Responses
no staff member	10.26	4
1-2 staff members	46.15	18
3-5 staff members	12.82	5
>5 staff members	30.77	12
Answered Question		39
Skipped Question		6

Section 2. IT Infrastructure, hardware and software used at your organization

5. Do all the staff members at your organization have access to the Internet?

	Response (%)	Responses
YES	94.59	35
NO	5.41	2
Answered Question		37
Skipped Question		8

6. How is your organization connected to the Internet?

	Response (%)	Responses
Fixed Broadband (ISDN, DSL, leased lines, cable, Power-line Internet etc)	75.68	28
Mobile broadband (3G, 4G)	8.11	3
Satellite broadband (VSAT)	0.00	0
Other (slower) connection (dial up modem, 1G, 2G)	16.22	6
Answered Question		37
Skipped Question		8

7. Indicate IT hardware used at your organization/institution/company

	Response (%)	Responses
Office network (LAN; with cabled internet or wifi)	23.53	28
Desktop computer in an office network (with cabled internet or wifi)	20.17	24
Stand-alone desktop computer	2.52	3
Laptop in an office network (with cabled internet or wifi)	19.33	23
Laptop (stand-alone)	13.45	16
Ipad or tablet	5.04	6
Mobile phone	15.97	19
none of the above	0.00	0
Answered Question		37
Skipped Question		8

8. Indicate software used at your organization/institution/company

	Response (%)	Responses
Word	24.50	37
Excel	24.50	37
PowerPoint	24.50	37
Other Office packages (e.g. Open Office)	8.61	13
SPSS & other statistical packages	7.28	11
Project Management software	2.65	4
GIS software	4.64	7
Other software not in this list	3.31	5
Answered Question		37
Skipped Question		8

Other software packages used
QuickBook
We have a partnership agreement with a Software Application Development company abroad. So we have an opportunity to practice different types of tools and techniques for different level project management and other software. We are testing a software for Monitoring and reporting, complete project management and information and knowledge management for decision making processes. Once it is ready to market, we will demonstrate to all our valued partners mainly CCCA.
Publisher, and all office software
Ms. Visio, Adobe Acrobat, Adobe Photoshop
STATA, R program
Adobe Audition Adobe Premier Adobe Creative Suite
Photoshop, Publisher
Progamming, Mathlab, Mike 21
Photoshop, Adobe Illustrator, Quakexpress....Quickbook, Peachtree....
MS. Outlook, Internet Explorer, Mozila Firefox, Google Crome

9   Does your organization/institution/company have a public website?

	Response (%)	Responses
YES	97.30	36
NO	2.70	1
	Answered Question	37
	Skipped Question	8

websites:
www.womencambodia.org
www.moh.gov.kh
Www.mcu.edu.kh
www.mcu.edu.kh
www.mcu.edu.kh
http://www.eeas.europa.eu/delegations/cambodia/index_en.htm
womencambodia.org
www,mcu.edu.com.kh
www.itc.edu.kh
http://forumsydcambodia.org/ and http://www.forumsyd.org/InternationalStart/

10. Does your organization have an Intranet for internal administration and content management?

	Response (%)	Responses
YES	71.43	25
NO	28.57	10
	Answered Question	35
	Skipped Question	10

11. Does your organization have an online web space to collaborate with partners and stakeholders outside the organization?
 (e.g. Extranet, Community of Practice, project work space, network space)

	Response (%)	Responses
YES	30.56	11
NO	69.44	25
Answered Question		36
Skipped Question		9

URLs:

- https://dca.adobeconnect.com/actclimate/

- http://capacity4dev.ec.europa.eu/

- http://Moys.gov.com.kh
- http://jcci-cambodia.org/

12. Does your organization encourage the use of the following interactive and collaborative tools?

	Response (%)	Responses
Instant messaging (e.g. WhatsApp, Google Chat)	19.79	19
Skype or other video-conferencing	30.21	29
Collaboration tools (Google+, wiki, Dropbox, GoogleDrive)	18.75	18
Social media (LinkedIn, Facebook, Twitter)	31.25	30
Answered Question		36
Skipped Question		9

13. Are staff members at your organization participating in an online workspace or Community of Practice (CoP)?

	Response (%)	Responses
YES	23.53	8
NO	76.47	26
Answered Question		34
Skipped Question		11

If YES, give name of workspace/CoP and links

I am not sure, but I think they are probably participating.

CCA/DRR CoP by https://dca.adobeconnect.com/actclimate/

Internal software called DIRA AND SOPAL

Section 3. Information and Knowledge needs for specific user groups

Your function within the organization. Different functions within the organization determine the kind of knowledge products required for your work.
In this section staff members can indicate their information and knowledge needs focusing on their own work.

14.   What is your position within your organization?

	Response (%)	Responses
Decision-maker	20.59	7
Policy/Programme advisor	11.76	4
Project Officer	29.41	10
Researcher	11.76	4
Communication, training, KM staff member/officer	0.00	0
Support staff	8.82	3
Local community member	0.00	0
Other,………………	17.65	6
Answered Question		35
Skipped Question		10

15.   Select the information and knowledge products that you need for your own work

	Response (%)	Responses
1.1. Information on existing datasets on Climate Change (adaptation and mitigation)	4.49	34
1.2 Information on CC experts and expertise in in various sectors	2.77	21
1.3 Information on organizations, institutions and companies working on climate change in Cambodia	3.96	30
1.4 Information on importers/exporters/national suppliers of technologies/materials	1.98	15
1.5 Information on climate change projects in Cambodia (map with locations, project summary, contact info)	3.69	28
1.6 Information on key R&D organizations and testing facilities for technology development	2.24	17
1.7 Information on providers of technical support for climate change response	2.51	19
1.8 Information on sources of funding for climate change response	3.30	25
1.9 Publications and reports on Climate Change (Response)	3.43	26
1.10 Cambodia Climate Change Strategic Plan 2014-2023 (CCCSP) and sectoral Action Plans (CCAPs)	2.90	22
1.11 Information on laws, regulations, tax incentives for technology development	2.51	19
1.12 Weather and weather forecast information	3.03	23
1.13 News and events on Climate Change Adaptation and mitigation in Cambodia	3.43	26
2.1 Climate scenarios for Cambodia	3.30	25
2.2 Trends/developments for various sectors/areas	2.11	16

2.3 Policy briefs on priority themes and new developments in CC (national/international)	2.64	20
2.4 Estimated climate impacts in various sectors/areas (specify sector/area in textbox below)	2.51	19
2.5 Vulnerability mapping and/or analysis in various sectors/areas (specify in textbox below)	3.03	23
2.6 Progress reports on outcomes of CCAPs for various sectors	2.90	22
2.7 M&E reports on performance of CC programmes and projects	3.17	24
2.8 Outcomes of (innovation) research projects on CC (national/international)	2.64	20
2.9 CC adaptation and mitigation options/technologies in various sectors (national/international)	2.51	19
3.1 Lessons learned on climate change response in Cambodia	2.90	22
3.2 International/regional lessons learned on climate change response	2.11	16
3.3 (Expert) networks for Knowledge sharing on CC adaptation and Mitigation (national/regional/international)	2.11	16
3.4 Awareness materials on climate change (response) for various sectors (specify sector in textbox below)	3.17	24
3.5 Training materials on climate change (response) for various sectors (specify sector in textbox)	3.30	25
3.6 Good practices on CC Response for local communities (booklets, videos, posters etc. for offline use)	3.56	27
3.7 Good practices on CC Response in various sectors (specify sector in textbox below)	2.37	18
3.8 Awareness raising and training materials for local partners in various sectors (specify sector in textbox below)	2.51	19
3.9 Climate change training manual for ToT in local community	2.77	21
3.10 Training in preparing Lessons Learned and Good Practices on CC adaptation and mitigation	2.77	21
3.11 Available CC adaptation and mitigation options/technologies in various sectors in Cambodia	2.11	16
3.12 Results of testing and adapting regional and international CC adaptation and mitigation options/technologies in various sectors in Cambodia	2.37	18
3.13 Case studies on successful investments in new CC adaptation and mitigation interventions in other countries	2.90	22
Answered Question		34
Skipped Question		11

16. Information and Knowledge products that your organization is providing to other stakeholders working on Climate Change in Cambodia

	Response (%)	Responses
1.1. Information on existing datasets on Climate Change (adaptation and mitigation)	7.66	18
1.2 Information on CC experts and expertise in in various sectors	5.11	12
1.3 Information on organizations, institutions and companies working on climate change in Cambodia	3.83	9
1.4 Information on importers/exporters/national suppliers of technologies/materials	1.28	3
1.5 Information on climate change projects in Cambodia (map with locations, project summary, contact info)	4.26	10
1.6 Information on key R&D organizations and testing facilities for technology development	0.43	1
1.7 Information on providers of technical support for climate change response	3.40	8
1.8 Information on sources of funding for climate change response	2.98	7
1.9 Publications and reports on Climate Change (Response)	6.38	15
1.10 Cambodia Climate Change Strategic Plan 2014-2023 (CCCSP) and sectoral Action Plans (CCAPs)	4.26	10
1.11 Information on laws, regulations, tax incentives for technology development	1.70	4
1.12 Weather and weather forecast information	1.70	4
1.13 News and events on Climate Change Adaptation and mitigation in Cambodia	5.96	14
2.1 Climate scenarios for Cambodia	2.98	7
2.2 Trends/developments for various sectors/areas	0.85	2
2.3 Policy briefs on priority themes and new developments in CC (national/international)	2.13	5
2.4 Estimated climate impacts in various sectors/areas (specify sector/area in textbox below)	0.43	1
2.5 Vulnerability mapping and/or analysis in various sectors/areas (specify in textbox below)	1.70	4
2.6 Progress reports on outcomes of CCAPs for various sectors	2.13	5
2.7 M&E reports on performance of CC programmes and projects	2.55	6

2.8 Outcomes of (innovation) research projects on CC (national/international)		1.70	4
2.9 CC adaptation and mitigation options/technologies in various sectors (national/international)		1.70	4
3.1 Lessons learned on climate change response in Cambodia		5.53	13
3.2 International/regional lessons learned on climate change response		1.70	4
3.3 (Expert) networks for Knowledge sharing on CC adaptation and Mitigation (national/regional/international)		1.70	4
3.4 Awareness materials on climate change (response) for various sectors (specify sector in textbox below)		3.40	8
3.5 Training materials on climate change (response) for various sectors (specify sector in textbox)		4.68	11
3.6 Good practices on CC Response for local communities (booklets, videos, posters etc. for offline use)		3.40	8
3.7 Good practices on CC Response in various sectors (specify sector in textbox below)		0.85	2
3.8 Awareness raising and training materials for local partners in various sectors (specify sector in textbox below)		2.98	7
3.9 Climate change training manual for ToT in local community		3.83	9
3.10 Training in preparing Lessons Learned and Good Practices on CC adaptation and mitigation		2.98	7
3.11 Available CC adaptation and mitigation options/technologies in various sectors in Cambodia		0.43	1
3.12 Results of testing and adapting regional and international CC adaptation and mitigation options/technologies in various sectors in Cambodia		0.43	1
3.13 Case studies on successful investments in new CC adaptation and mitigation interventions in other countries		2.98	7
		Answered Question	33
		Skipped Question	12

Add any other I&K products that your organization is providing to other stakeholders
Most of the issues are address but not organized so way so i just selected one. 4.1. Knowledge Management GEF Advisory grop member since October 2015. It gives us an opportunity to disseminate huge knowledge products to our line partners and collaborators; 4.2 Information and Knowledge UNISDR Advisory Group member since September 2015. It gives us another opportunity to access to and disseminate huge DRR documents to our collaborators In addition, Save the Earth is the Elected SEA Regional Focal Point of GEF CSO network 4.3 It worked as the SEA Regional Coordinating Organization to monitor the HFA implementation progress at local government and civil society levels. So we could share number of knowledge and information management mainly DRR documents to stakeholders
JCCI outputs and publications

Section 4. KM systems and tools that you already are using/want to use in the future

Online and offline ICT systems and tools help you to collect, find, store and share information and knowledge; face-2-face interaction is important and is also added to the list. Staff members can indicate the online and offline they are currently using and want to use in the future in this section.

17. Select the ICT systems and tools that you are currently using for your work

		Response (%)	Responses
1. Websites on Climate Change in Cambodia (e.g. CamClimate website) and abroad		9.06	31
2. Google Search (or other search engines)		9.36	32
3. Online libraries (e.g. of universities, int. organizations and resource centres)		4.68	16
4. e-Newsletters (online or sent by email)		5.85	20
5. Email & documents sent by email		8.77	30
6. RSS feeds from websites		1.46	5
7. Social media (Twitter, Facebook, LinkedIn, others)		8.19	28
8. Online Communities of Practice (CoPs), e.g. UN Teamworks, DGroups		1.46	5
9. Online conferencing, chatting and messaging (e.g. Skype, GoogleTalk)		4.09	14
10. e-Learning website(s)		3.51	12
11. Online databases and repositories (e.g expert database, Organization database, Publication repository)		2.34	8
12. GIS applications for mapping (e.g. ARCGIS, QGIS, GoogleMaps etc)		2.63	9
13. Books and reports (received at workshops/conferences)		7.02	24
14. Library of your organization		4.09	14
15. Calls (phone/mobile) with colleagues		5.85	20
16. Face-to-Face meetings, workshops, conferences, project meetings		7.31	25
17. Face-to-Face Training, Brown Bag meetings, awareness raising meetings		4.68	16
18. Face-to-Face Helpdesk/Training		2.34	8
19. Face-to-Face Mentoring /Peer assist		2.05	7
20. Face-to-Face Informal meetings/talks with colleagues		5.26	18
	Answered Question		36
	Skipped Question		9

Add any other tools/offline channels/F2F interaction that you use, that are not in the list

We are testing a **Virtual Learning Tool**. It is an advanced software that can better help in Training and Capacity Building. It can support 100s participants/institutions from different sties. It is like One Teacher teaches and any number of participants can learn. We will be happy to demonstrate how the Virtual learning Tool can serve decision makers in capacity building of their subordinates like how MoE can build capacity of its provincial counter parts from Phnom Penh and many more functions

18. Indicate the ICT systems and tools that you want to use (more) in future for your work ('wish list')

	Response (%)	Responses
1. Websites on Climate Change in Cambodia (e.g. CamClimate website) and abroad	9.14	31
2. Google Search (or other search engines)	5.60	19
3. Online libraries (e.g. of universities, int. organizations and resource centres)	6.78	23
4. e-Newsletters (online or sent by email)	5.90	20
5. Email & documents sent by email	5.90	20
6. RSS feeds from websites	2.36	8
7. Social media (Twitter, Facebook, LinkedIn, others)	6.49	22
8. Online Communities of Practice (CoPs), e.g. UN Teamworks, DGroups	5.01	17
9. Online conferencing, chatting and messaging (e.g. Skype, GoogleTalk)	4.72	16
10. e-Learning website(s)	5.60	19
11. Online databases and repositories (e.g expert database, Organization database, Publication repository)	5.31	18
12. GIS applications for mapping (e.g. ARCGIS, QGIS, GoogleMaps etc)	5.31	18
13. Books and reports (received at workshops/conferences)	5.60	19
14. Library of your organization	3.83	13
15. Calls (phone/mobile) with colleagues	2.95	10
16. Face-to-Face meetings, workshops, conferences, project meetings	6.19	21
17. Face-to-Face Training, Brown Bag meetings, awareness raising meetings	3.83	13
18. Face-to-Face Helpdesk/Training	3.24	11
19. Face-to-Face Mentoring /Peer assist	2.95	10
20. Face-to-Face Informal meetings/talks with colleagues	3.24	11
	Answered Question	36
	Skipped Question	9

Add any other tools/offline channels/Face-to-Face interaction that you want to use that are not in the list
21. Virtual Learning Tool 22. Multimedia Library (it is the latest version of library) 23. CSO-Government Dialogue Platform (face-to face, online and cross connections). There is a gap between the CSOs and Government institutions, GEF CSO has been working on it to find a solution to reduce the gap to enable enhanced collaboration and partnership as trusted partners.

Section 5. Any remarks or questions?

Thank you for taking the time to participate in this KM e-Survey. In this section staff members can add any additional remarks or comments.
Your contribution is highly appreciated and will be important for the development of the Knowledge Management Framework and the Knowledge Portal on Climate Change.

We will keep you informed on the progress of the Knowledge Management activities for climate change response in Cambodia.

Best regards,

Dr. Heng Chan Thoeun
Deputy Director
Department of Climate Change, General Secretariat, National Committee for Sustainable Development
Result 3 Team Leader, Cambodia Climate Change Alliance (CCCA)

20. REMARKS:

Responses (9)

I appreciate this survey, and would like to follow and result as well as CCCA and Department of Climate Change/MoE works and attend the event.

Thank you very you very much for your survey about climate change I happy to joint with government teams for sharing the information about climate change and adaptation. Best wish Chea Sarith President of WOMEN 855 12 949 982

Dear Dr. Chan Thoeun, I would very much appreciate if you can also share me the final result of the survey. It is really help to identify what is the key potential activities of the coming future. Kindly regards, Chapho S. Chittra

On behalf of Chetthor Organization will lining up to work actively in the development and reducing the climate change in Cambodia.

I am Hoeun Houn, the representation of Our Objective Organization "OOO" would like to say deeply thank and appreciated for your survey and make me learn more on what the new for Climate Change. Best wish. Hoeun Houn

I will be grateful to consult on the following ICT items: 1) Virtual Learning Tool for training and capacity building to support the country wide programs 2) Application on M&E/Monitoring and Reporting 3) Multimedia Library 4) Total project Management solutions etc. Many thanks.

Good luck and look forward to further cooperation. Thank you.

Dear DCC, Firstly thank for your survey, I am please to taking your survey, If this survey with both version (Khmer and English version are so good) Best Regards Chhet Tehong

ANNEX 2. LIST OF GLOBAL WEBSITES AND PORTALS DEALING WITH CLIMATE CHANGE AND GREEN TECHNOLOGY

Institution/Community	Knowledge Information Portal	Information / Knowledge
GCCCA EU programme on climate change adaptation/mitigation	http://www.gcca.eu/	Publication repository (technical and training documents)
WEADAPT	https://www.weadapt.org/	a collaborative platform on climate adaptation issues. It allows practitioners, researchers and policy-makers to access credible, high-quality information and connect with one another.
CIP	http://cip.csag.uct.ac.za/webclient2/app/	web interface that integrates two important information sources. 1. a climate database that stores and manages queries to a large suite of observational climate data as well as projections of future climate. 2. collection of guidance documentation that facilitates the best use of the climate data
Regional Climate Change Adaptation Knowledge Platform for ASIA	http://www.climateadapt.asia/	The Adaptation Knowledge Platform is a response to the demand for effective mechanisms for sharing information on climate change adaptation, and for developing adaptive capacities in Asian countries. The initiative supports research and capacity building, policy making and information assimilation, generation, management and sharing; Repository with publications
AIT (Thailand)	www.ait.th	higher education, research and outreach on climate change adaptation and mitigation
APAN – Asia Pacific Adaptation network	http://www.asiapacificadapt.net/	APAN is to build climate change resilient and sustainable human systems, ecosystems and economies through the mobilisation of knowledge, enhanced institutional capacity and informed decision making-processes, and facilitated access to finance and technologies.
Adaptation Learning Mechanism	http://undp-alm.org/	knowledge-sharing platform on country led programmes and projects financed by the Least Developed Country Fund (LDCF), Special Climate Change Fund (SCCF), Adaptation Fund (AF), bi-lateral donors and through decentralized

		cooperation supported by UNDP's Down to Earth: Territorial Approach to Climate Change (TACC) project; Resources section with publications
SEA Change	http://www.seachangecop.org/	Community of Practice (CoP) focused on the monitoring and evaluation of climate change interventions in Asia, and beyond.
World bank	http://sdwebx.worldbank.org/climateportal/index.cfm	The CCKP provides a web-based platform to assist in capacity building and knowledge development. The aim of the portal is to help provide development practitioners with a resource to explore, evaluate, synthesize, and learn about climate related vulnerabilities and risks at multiple levels of details
European Institute of Innovation and Technology (EIT) - Climate-KIC (Knowledge and Innovation Community)	http://www.climate-kic.org/themes/adapting-to-climate-change/	Portal with targeted navigation for students, entrepreneurs, business and public bodies Entrepreneurs focus on ideas; businesses focus on market accelerator
Climate Technology Centre and Network (CTCN)	http://ctc-n.org/	Network with technical assistance (to dev countries) and capacity development (webinars, incubator programme, Knowledge sharing programme, regional for a) Knowledge Management System
WorldWideEnergy	http://worldwideenergy.org/wwe/	a federated search application giving users a single entry point to find targeted energy-related content.
Sustainable Energy for ALL (WB-UN)	http://www.se4all.org	SE4ALL programme focusing on universal energy access, renewable energy and energy efficiency with regional hub led by ADB.
Copenhagen Centre on energy efficiency (SE4ALL EE Hub)	http://www.energyefficiencycentre.org/	Copenhagen Centre on Energy Efficiency (C2E2) is dedicated to accelerating the uptake of energy efficiency policies and programmes at a global scale. Database on EE institutions and EE initiatives Accelerators Network (registration required)
ClimateTechWiki	http://www.climatetechwiki.org/	Drupal website with information on technologies, technology implementation and investment options, national technology frameworks and publications on Technology Transfer
CTI PFAN - Private Financing Advisory network	http://www.cti-pfan.net/	

WRI - Vulnerability & Adaptation Database (projects)	http://projects.wri.org/adaptation-database	Database with 135 adaptation projects, policies, and other initiatives from the developing world.
Asia Pacific Adaptation Network - Resources	http://www.apan-gan.net/resource	DB with 1287 resources
InfoDev – Climate technology	http://www.infodev.org/climate	InfoDev portal on Climate Technology Program: Innovators in developing nations are devising bold new answers to climate change. At our Climate Innovation Centers, we help clean-tech entrepreneurs launch companies, create jobs, and provide their communities with cleaner energy, water, food and air, while using fewer resources.
Solutions Library | Engineering for Change	https://engineeringforchange.org/solution/library/viewAll/Water.action	With Solutions on water, energy, health, structures, agriculture and sanitation
World Intellectual Property Organization - GREEN	https://webaccess.wipo.int/green/	GREEN database for technology and IPR assets: administrative aspects, agriculture and forestry, alternative energy production, energy conservation, transportation, waste management + a NEEDS database (57 needs identified)
REEEP - Vienna	REEGLE - Clean Energy Info Portal http://reegle.info	• Country energy profiles including key statistics, policies and actors • Clean energy search of the most authoritative sources • Free tool for intelligent tagging and providing related content • Map search of energy statistics and potentials • reegle blog with insights and background information
Start-up Commons	http://www.startupcommons.org	Part of the Growvc Group (http://group.growvc.com), the world leading, global pioneer of securities crowd funding, peer to peer marketplaces, new investment models and global business development. Startup Commons provides services to bring companies and investers together as a solution for governments to develop, manage and measure start-up ecosystems. To increase innovation, create new jobs and cater information for international investors and big companies.

		Startup commons is an issuer-side support platform (the side of the companies that want to market an innovation)
Global Innovation Commons	http://www.globalinnovationcommons.org	The Global Innovation Commons (G.I.C.) provides a world-wide repository of all innovations which, while possibly protected in one or more countries, have the ability to be used in the rest of the world due to patent expiration, abandonment, invalidity, or failure to file in-country protection. The G.I.C. enables the immediate "open source" generic production of most technologies – even those considered most cutting edge – in markets where patent holders failed to seek or gain protection.

ANNEX 3. EXISTING DISTRIBUTIONS OF THE DRUPAL CMS AND TWO OTHER SOFTWARE PACKAGES THAT MAY BE USEFUL FOR THE DEVELOPMENT OF THE K PORTAL

	Software	Description	Website/URL
	Drupal 7	Open source CMS, also used by UN Teamworks	http://www.drupal.org
	Drupal distributions		
1	Cartaro	Cartaro is the web mapping platform that brings the power of the best open source geospatial components into Drupal. With Cartaro you are able to set-up and run your own geo-enabled and OGC standards-compliant website with not more than a few clicks. The geospatial components used in Cartaro are PostGIS, GeoServer, GeoWebCache and OpenLayers. Cartaro is for organisations and individuals that need to run a light-weight spatial data infrastructure (SDI) without the need for extensive configurations and much individual programming. Cartaro is also for all websites that focus on CMS features while also having to handle geospatial data.	https://www.drupal.org/project/cartaro http://cartaro.org/
2	OpenScholar	Drupal 7–based website application builder; A multitenant architecture that allows academic institutions to host thousands of websites in a single instance of the application. Built on top of Drupal and a full stack of open source tools and technologies and used by many academic institutions worldwide.	http://theopenscholar.org/
3	OpenPublic	OpenPublic is an open-source, content management system (CMS) based on Drupal and tailored to the needs of government. For government and public policy organizations, open source only works if it's built for the security, accessibility and flexibility requirements of the public sector. OpenPublic provides a content management system specially designed for open government goals -- without compromising accessibility, security or usability. OpenPublic is the most accessible and secure open source CMS for government available.	http://openpublicapp.com/ https://www.drupal.org/project/openpublic

	Software	Description	Website/URL
4	OpenAtrium (Version 2 for Drupal 7)	Open Atrium is an intranet in a box that has group spaces to allow different teams to have their own conversations and collaboration. A new architecture for Drupal 7 that is built upon **Panopoly** and intended as an extensible collaboration framework. Adds the ability to have private "sections" within a collaboration space with granular access control.	https://www.drupal.org/project/openatrium
5	Opigno LMS	Opigno LMS is a full-fledged Learning Management System based on Drupal. It allows to: (1) manage training paths organized in courses and lessons; (2) assess students thanks to varied quizzes; (3) award certificates to successful students; (4) sell your trainings online; (5) facilitate interactions thanks to live meetings, forums and chats. And more….	https://www.drupal.org/project/opigno_lms
6	Open Outreach	Outreach is an adaptive, CSS-based, multi-column layout, recolorable theme that uses HTML5 and CSS3 and has drop-down menu support via Superfish. Outreach is an AdaptiveTheme 3.x subtheme that ships with the Open Outreach distribution for nonprofits but can be used on any Drupal site. Via AdaptiveTheme, it fully supports mobile devices using modern responsive design methods - this gives you *instant support for the mobile web*. Outreach makes it easy to change things like the sidebar layout, sidebar width, page width and you can have it fluid or fixed width also. Customize the fonts, menus, breadcrumbs, search results, colors and many others aspects of your Drupal site - all with easy to use theme settings.	https://www.drupal.org/project/outreach
7	Drupal Ecological Information Management System (DEIMS)	An installation profile for storing, editing, and sharing data and information about your biological and ecological research. DEIMS provides user-friendly forms to describe all contextual information about your data. DEIMS produces automatically Ecological Metadata Language to share your records with other networks and metadata clearinghouses such as the ORNL-DAAC and the Knowledge Network for Biocomplexity. DEIMS allows you to query external databases using the Data Explorer feature.	https://www.drupal.org/project/deims http://www.lternet.edu/

	Software	Description	Website/URL
	Exhibit 3	Publishing Framework for Large-Scale Data-Rich Interactive Web Pages; Exhibit lets you easily create Web pages with advanced text search and filtering functionalities, with interactive maps, timelines, and other visualizations. The Exhibit 3.0 software has two separate modes: Scripted for building smaller in-browser Exhibits, and Staged for bigger server-based Exhibits.	http://www.simile-widgets.org/exhibit3/
	The DATAVERSE Project	A repository for research data that takes care of long term preservation and good archival practices, while researchers can share, keep control of and get recognition for their data. Supports the sharing of research data with a persistent data citation, and enables reproducible research.	http://thedata.org/