



**Manual for the use of the
DISforLADA WEB-DB TOOL**





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DISforLADA WEB-DB TOOL**

Claudio Zucca

Luca S. Percich

NRD – UNIVERSITY OF SASSARI

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DIS DATABASE USER MANUAL

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1. Introduction

1.1. Basic concepts for users and guests

DIS4LADA means “*DB Indicator System for LADA*”. It is a WEB hosted Data Base application created by the NRD of the University of Sassari (Italy), in collaboration with FAO.

Its main function is to store *indicators Fact Sheets for all the indicators developed by LADA at all levels of scale (Global, National, Local)*. So far, they mainly include project indicators (common to all LADA countries) but the site is intended to host also indicators specific to single implementing countries.

So, *indicators Fact Sheets* constitute the basic content of the system. They provide exhaustive methodological information aimed to the users of the indicators. The rest of the system components is basically made of an interface and of several kinds of relational tools. These are necessary to make the Fact Sheets easily available and to give an idea of their role in the context of the LADA system.

The system was originally developed within a European research project called DESERTLINKS and contains also the indicator system developed by that project, called DIS4ME. Although the two tools are independent and the interfaces different, many elements are common to the two, such as the home page and the help instructions.

The system interface and the Help information are fully available in three languages: English, French and Spanish.

ACCESS TO THE SYSTEM

You can have access to the system from the home page <http://nrd.uniss.it/dis/index.php> in two ways:

- as a *guest*, by selecting the project and simply clicking the corresponding logo
- or as a *registered user* through an access granted by the LADA team at FAO

Project	User name	Password	Login as registered user
DISforLADA	nrd		

As a guest you have access to all information made available by the Administrator (FAO) to the public audience and you are not allowed to edit it.

When you are in, you are in “DB mode”. Even if you are a guest, in DB mode you basically are in the same environment as the registered users, so you may “navigate” through the system in the same way, using all the options discussed below.

However, once inside you can also browse the DB content in “HTML mode” by clicking the “*Synthetic fact sheet list*” hypertext located on the indicators list frame.

Why two different options? Because we thought that the guest may be not very familiar with a DB and its query tools.... and that he may want just to browse the system like a WEB site. So, just having a long alphabetic list of indicators and scroll it up and down to find the good one.

This HTML text is a dynamic image of the DB content, so it is always updated.

In addition, it applies a filter to the fact sheet content, showing only the basic information related to each indicator.

LOCATING LADA INDICATORS inside the DB.

DIRECT ACCESS BY LADA GROUPS

For the LADA users, both registered and guests, the most direct way to locate the LADA basic indicators *common to all countries* is by clicking on INDICATOR GROUPS.

As the LADA experts of the six pilot countries already know, LADA developed several tenths of indicators, related to different levels (scale) and phases of the assessment. The groups defined in DIS4LADA reflect this organisation. So, if you click *indicator groups* on the left frame, you will see the following 15 groups (with the full list of “member” indicators for each of them):

GLOBAL (GLADA):

1. GLADA geospatial indicators

2. *GLADA LUS (socio-economic) indicators*

NATIONAL(Wocat QM):

3. *LADA-N Wocat - Land Use Systems indicators (state indicators)*
4. *LADA-N Wocat - Soil erosion by water (state indicators)*
5. *LADA-N Wocat - Soil erosion by wind (state indicators)*
6. *LADA-N Wocat - Chemical soil deterioration (state indicators)*
7. *LADA-N Wocat - Physical Soil Deterioration (state indicators)*
8. *LADA-N Wocat - Water degradation (state indicators)*
9. *LADA-N Wocat - Biological degradation (state indicators)*
10. *LADA-N Wocat - Direct causes of land degradation (pressure indicators)*
11. *LADA-N Wocat - Indirect causes of land degradation (indirect drivers)*
12. *LADA-N Wocat - Impact on ecosystem services (Impact indicator)*
13. *LADA-N Wocat - Land conservation (Response indicators)*

14. *LADA-N Socio-Economic indicators*

LADA BIO-PHYSICAL TOOLBOX

15. *Several general reference indicators from LADA technical documents*

Several local indicators from LADA Local Manual are also available, but not included in a formal group. They can easily be seen using the “LADA spatial scale” criteria from the scroll down menu “list by” option as described below¹.

Please remember that specific country indicators are not included in these groups, but they will be easily accessible using the “LADA Country” *List by* tool, as explained below.

OTHER OPTIONS FOR RETRIEVING INDICATOR

¹ Please note the field “spatial scale” refers to the DIS4ME coding system, as explained by the HELP text, and is not necessarily corresponding to the LADA scales, but it can be of help to refine the definition of the indicators scales.

If you are not familiar with the way LADA used to structure and organise the indicator sets, or you just want to explore them through a more cross-cutting approach, you have a number of options.

The most popular one is the nested ”*list by*” options in the indicators window. As an example you may chose “LADA spatial scale” and then “country” as criteria and this would list all the indicator by LADA scale first and, for each level of scale, by LADA country if applicable. Other criteria are based on *classification fields* included in the indicators fact sheets. These were in part inherited from DIS4ME. They are listed in paragraph 3.2 and the Appendix describes how to use and interpret them.

In alternative you may use the options offered by the *Search Tool* (accessible from the left frame). This tool, based on the same classification criteria (and some more), allows you to see the indicators in an environment simulating a *Windows Resource Explorer tree (or file system)*.

Finally, you can use the *Keywords* tool, based on keywords defined by the users.

The following chapters explain in more detail how to use these tools.

UPLOADING AND UPDATING INFORMATION

To be allowed to do it, you must be a registered user. You must ask the LADA team at FAO (System Administrator) and agree with them your *user rights*. Then you will be given a login and password, as usual.

When you login as registered user you are given *edit rights*. Basically, you can:

- create a new indicator fact sheet (this will be marked as “yours”);
- update an existing one (if it was created by you)

This manual provides exhaustive explanations on these and other data editing options. The *HELP system on-line* also provides more synthetic, but exhaustive information.

Please note that, unless the System Administrator takes a different decision, the indicators created by a users remain not visible to the wider guests community, until the **Administrator approves** them.

A further possibility you are given is to visit the DIS4ME side of the DIS system. There you may find that some indicators already available may be useful to you. As an example, some of them could match the specific requirements of LADA implementation in one LADA country. In this case, on your suggestion, the System Administrator could select them and make them visible to the LADA users: they can thus become, virtually, LADA indicators (in this case they will be marked as “selected from dis4me”).

1.2. About the DIS application

The indicators system has been turned into a public accessible database, in order to fully exploit the powerful combination of Relational Databases and Internet:

- Data is structured and subject to checks and constraints: this results in a better integrity and solidity of the whole indicators' system.
- The relational structure makes it possible to link different items (indicators, keywords, bibliography), which results in an hypertext interface to the database.
- Data is searchable and cross-referenced.
- Data is easily edited once in a single, centralized repository on which different and always up to date views may be created.

The web-db application is a tool aimed at cooperation and knowledge exchange.

2. Application interface

2.1. The application window layout

Overview

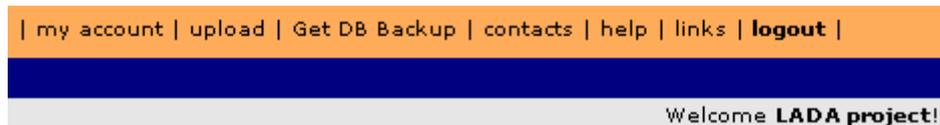
Apart from a different colour layout and small differences in the indicator description, the DISforME and DISforLADA applications have the same look and feel and behave the same way - yet they are the same application.

Once logged in from the DIS homepage, the main DISforME/DISforLADA application window opens, according to which project has been chosen during the login process.

The main window has a fixed layout, regardless of which section is being accessed: a toolbar frame, a menu and a document frame.

The toolbar

The toolbar is located in a fixed, horizontal frame on the top of the window. It contains the application text logo, the language selectors as well as a set of hyperlinks which can be used to activate different functions:



A welcome message showing the user name and editing rights is visible in the lower right part of the toolbar. On the lower left side of the toolbar, the login time for the current session and for the previous one are shown.

Toolbar commands:

my account	Available only for registered users: displays user data and preferences in the document frame.
upload	Available only for registered users: a tool for uploading images to the DIS server; such images can be referenced from within the indicators' forms ² .
Get DB	Available only for administrators: downloads a plain text SQL of the

² This functions is not available at present due to the higher security standard of the hosting server.

Backup	DIS database.
contacts	sends a mail to the DIS DB admin.
help	Opens the help window.
logout	Disconnects the currently connected user and closes the application window.
DIS-DB HOME	Same as above, but shown only when a guest user is connected to the system.

The language selector is made of three hyperlinks to the available languages: English, French and Spanish. The selection will affect the whole user interface, but not the *database content*, which is *in English only*.



The current language is highlighted and not selectable.

The menu

The menu is a fixed set of text buttons which can be found on the left part of the main window. When a button has been activated, it turns white and is no more clickable; otherwise, its text will turn underlined when mouse passes over it, indicating that an hyperlink can be activated.

The menu contains the following sections:

INTRO	A brief introduction text is shown in the document frame.
DATABASE VIEW	This button switches in to database view mode , giving access to the DIS database contents. The user can have direct access to the database tables by clicking on the table names buttons below: Indicators, Indicator groups, Bibliography, Keywords.
SEARCH TOOL	This button opens the search tool in the document frame.

Under the menu, a small panel shows the following pieces of information:

List of Acronyms

Last edited indicator:
14/11/09;
Online guests: 2.
Online users: 0.
132 published on 137
total indicators

- the last time an indicator has been edited*;
- the number of guests and users currently online;
- the number of published (approved) and total (approved and proposal) indicators.

[More info...](#)

The More info... hyperlink opens an info page with the list of the last 10 edited indicators*.

**Guests are shown the most recent approved indicators, while registered users see the most recent edits regardless of the indicator's status (proposal / approved).*

The document frame

The document frame is the large, white frame in the middle of the main window, where relevant pieces of text, data and database tools are being displayed.

Some tools and data are handled in popup windows.

2.2. The database view

The database view is like a window on the DIS database. When in database view, users are looking at database contents.

There are several ways a user can activate the database view. The first and more obvious is to click on **DATABASE VIEW** or on a table name in the **main menu**. But

the database view can also be activated indirectly, for example from within the **SEARCH TOOL** by clicking on a search result.

*When in database view, there's always a **current table** (e.g., Indicators, Indicator groups, Bibliography, Keywords), which name is highlighted in the left menu frame. Records from one table (i.e. Indicators) may contain links to records from other tables (i.e. Bibliography): as these links are navigated through in an hypertextual way, the current table changes.*

The table list

The menu items under the DATABASE VIEW main item can be used to open a **list view** on the corresponding DIS table:

- **Indicators**
- **Indicator groups**
- **Bibliography**
- **Keywords**
- **Project members**

2.3. List and detail views

List view

The list view loads in the document frame the contents of the **current table**, one **record** per row. Only few fields are presented to the user: the **name** field allows to identify the record and is always hyperlinked to the corresponding record's **detail view**. See below for further details.

	Cultivated sloping land (123, A)
	DEFORESTED AREA (22, A) (selected from DISforME)
	DROUGHT (SPANISH NAP) (25, A) (selected from DISforME)
	GRAZING INTENSITY (77, P) (selected from DISforME)
	Ground water level (131, A)
	GROUNDWATER DEPTH (CHANGE IN) (79, P) (selected from DISforME)
	LADA-G: ARIDITY TREND (227, A)

The  **lock** icon on the first column indicates that the record belongs to another user and cannot thus be edited. Only records marked with  open locks can be edited. Guest users will find no editable items. On the contrary, administrators are allowed to edit

records they do not own. Inside the parenthesis (for indicators only), the progressive number of record creation and the indicators status: Proposal/Approved).

Paging is set to 20 rows, so if the number of records in the current table is more than 20, the paging controls will be activated, and the user will be able to move along data pages.

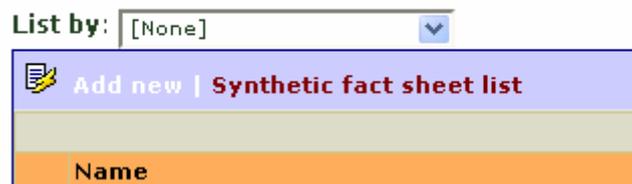
The **Paging controls** contain a record counter, which says the position of the currently displayed set of records within the current table, as a set of text buttons which point to the first, previous, next and last page.



They are located at the top and bottom of the list view table.

When a project member is logged in, an  **Add new** command appears in the list view table header.

DISforLADA DB :: Indicators - List



See **editing tables** (par. 2.4) for further details.

Detail view

The detail view shows a single record's details in a two-column table: the first column contains the field names, the second one holds the corresponding values.

Some fields may contain **references** to other records from different tables (i.e. bibliographic references in the indicators table). These fields are always hyperlinked to the detail view of the corresponding record. Following these hyperlinks may lead to change the current table.

In detail view, the table header contains a set of text commands.

DISforLADA DB :: Indicators - detail

 Edit  Add new  Clone  Delete...  List  Print Synthetic fact sheet	
Definition	
Name	ARIDITY INDEX
Brief definition	The ratio of mean annual precipitation to potential evapotranspiration : AI = P/PET
Units	P and PET must be expressed in the same units, e.g., in mm; numerical rating (ratio)
Other definitions	
Keywords	
Country	
Country	[Common to all countries]
Classification	
Operational objectives	Monitoring To identify and map areas prone to drought, vulnerable areas and drought-affected zones. To measure and map the degree of aridity of drylands. To determine average amount of available water for livestock and agricultural utilization in the drylands zones. To provide soil and crop management practices that can reduce the impact of water scarcity.
Position within D.P.S.I.R.	State

The  **List** command is always available, and switches back to **list view**.

When a project member is logged in, the  **Edit**,  **Add new** and  **Delete** commands appear in the table header. See the following **editing tables** paragraph for further details.

2.4. Editing tables

General concepts on database editing

DIS (DIS4ME/DIS4LADA) is a collaborative shared database system. Registered users may perform edits, thus changing the contents of the indicators database.

When table edits are enabled (see further on), the following editing actions will be available:

- editing the contents of a record;
- adding a new record;
- deleting a record;
- linking a record to another one (for instance, an indicator to a keyword);
- deleting a link between two records.

Enabling table edits

As told before, a DIS registered user must be logged in the system before he can perform database edits. Guest users are not allowed to change database contents.

When a user **creates** a record, he automatically becomes the **owner** of that record. He and only he will be able to perform further edits on that record, thus being responsible for its maintenance and contents. Nobody else has the permission to edit or delete that record, apart from **DB administrators**.

*A user may **link** a record he owns with **any** other record, regardless its ownership. See below for details.*

Editing a record in detail view

To edit an existing record, the following requirements must be met:

- the user is logged in the system;
- the user is the owner of the record;
- the record is in detail view.

A detail view for a record may be opened either clicking on a record name from the **list view**, or **following an hyperlink** from other records in detail view, or using the **SEARCH TOOL** and clicking on a search result.

Once in detail view, edit mode may be activated clicking on the  **Edit** hyperlink.

Edit mode is similar to detail view, but **field contents** are shown inside HTML text or list **controls** and can be thus modified.

Record status	A - Approved
Project *	I - DISforLADA
Visibility *	I - DISforLADA only
Date	14/11/09 16:39
Inserted by	Nucleo Ricerca Desertificazione
<input type="button" value="Save changes"/> <input type="button" value="Cancel"/> <input type="button" value="Restore field values"/>	

*When in edit mode, a warning with the **session expire time**³ is issued at the top of the page. The clock is reset after each save. All edits made after reaching the expire time (usually one hour) will be lost, so it's advisable to save often (at least 1-2 times per hour), especially when editing information-rich items.*

After modifying field values as needed, the user must press the "**Save changes**" button at the bottom of the form, so that the new values will be stored in the database; if the "**Cancel**" button is pressed instead, or the browser window is dismissed, the database will remain unchanged and all the edits will be lost.

Some fields cannot be empty: they are marked with a star sign (). A popup error window will alert the user if he tries to save a record with missing required data.*

The **Restore field values** button will restore the form values back to the beginning of the edit section.

The "Restore field values" command does not read again the database contents, but just restores data fields to the values they had when the form was opened for editing. Since there's a locking mechanism for preventing two users from modifying the same record, this difference is just theoretical.

If the user needs to make sure the page contents reflect database contents, he must close the edit view with the Cancel button and open it again with the Edit command

Adding a new record

Records can be added with the  **Add new** command, which is available from the detail and list view.

The add new command will bring up an empty edit form, which can be handled in the same way discussed in the previous section.

Cloning an indicator

Indicators (indicators only) can be cloned with the  **Clone** command, which is available from indicators' detail view. Cloning means creating a new indicator using the old one - from which the Clone command is issued - as a template: all the fields from the original indicator are copied into the new indicator; the Name, Authors and Notes

³ The function of the session expire time is to prevent unwanted locking of database records. When an user starts editing a record, a lock on that record is issued to prevent another user to modify the same data. The expire mechanism guarantees no lock remains from not properly closed edit sessions.

fields are modified with reminder text stating the new indicator is initially a plain a copy of the old one.

After cloning, the new indicator is shown in the edit form for further editing. This can be useful if the newly created indicator differs from the old one in a few features only.

*If the **Cancel** button is pressed, the new indicator will be discarded.*

Editing links with other tables

Linking two records means creating a **relation**, or cross-reference, between them. This relation is stored in a record in a separate table.

Relations can be created only between **existing** records. For example, if the user wants to add a bibliographic reference to an indicator, he must first check in the bibliography table that the desired reference has been defined. If this entry cannot be found, it has to be inserted. Once the bibliography record has been inserted, user can switch back to the indicator, and create a link with the bibliographic reference.

In DIS, the following relations are defined:

- Indicators :: Bibliography
- Indicators :: Indicator groups
- Indicators :: Keywords
- Indicator groups :: Keywords
- Bibliography :: Keywords

Although links are bidirectional, they usually might be edited from a single perspective: users can link keywords to an indicator, but are not allowed to link indicators to a keyword. The relation Indicators :: Indicator groups can be edited form both sides.

The user-interface for editing links is a popup window which can be started from **edit mode** (i.e.: indicator record edit mode) by clicking on the appropriate command (i.e.  **Keywords**): the window will allow to edit links from the **current record** to the selected table (“**destination table**”).

DISforLADA DB :: Indicators - detail

Warning: your session will expire at 16/11/09 17:05

Keywords Bibliography Indicator groups Related Indicators	
Definition	
Name *	Aridity index

The popup window can show a list of **already defined links**, each with a **Delete link** button; and a single row, with a set of controls for inserting link data and a **Create link** command button.

On the top of the window, the **source record** identifier (for example, the name of the indicator) for the relation is always highlighted.

To create a new link, a **destination record** must be selected from the dropdown list generated from the destination table (for example, the keywords table) pressing the **create link** button will create a permanent link between the source and the destination record.

*Only in the case of keywords, the relation can be created with a still non-existing record, because the keywords links window has a **New keyword** command associated with a text box, by means of which the user can create the keyword and link it to the current record at the same time.*

Once he's finished editing links, the user can dismiss the window pressing the **Close window** button.

Existing links cannot be modified, but have to be deleted and created again with the new values.

Linking two records don't affect their contents. Deleting a link will not delete the linked records, but just the reference between them.

2.5. The search tool

Introducing the search tool

The search tool has been designed for quickly finding an indicator or a list of indicators according to given criteria.

To access the search tool, click on **SEARCH TOOL** from the **main menu**.

Search: By LADA country and scale

This option is available in LADA project only. Clicking on "By LADA country and scale" will show the list of LADA countries and LADA spatial scales; clicking on an item will show the list of indicators which belong to the selected country or have the same spatial scale.

Search: by classification criteria

Clicking on "by classification criteria" will expand a list of defined classification criteria, which are in fact fields defined for the **indicators table**. The meaning and the theoretical bases of these criteria are explained in the Appendix.

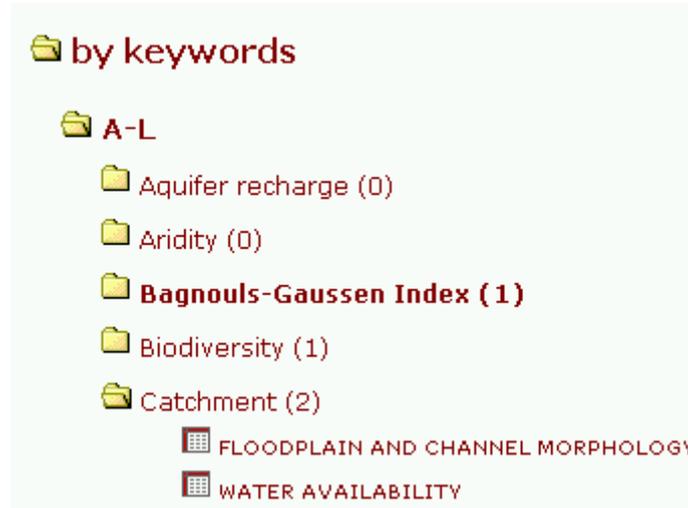
Clicking on a field name will expand a list of all its values, and clicking on a single value will list all the indicators which have the chosen value for the selected field.



Search: by keywords

This item gives access to two lists of keywords (one from A to L, the other from M to Z). Expanding a list will reveal all the keywords in alphabetical order. Clicking on a

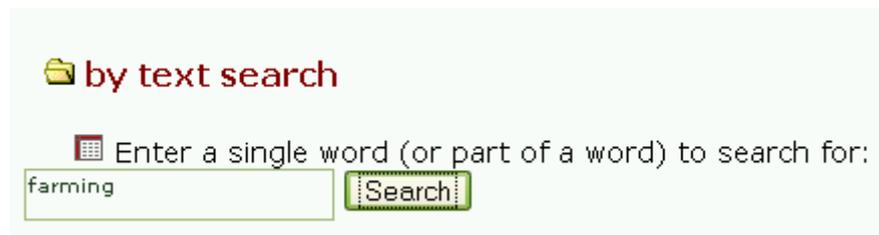
keyword will list all the indicators which have been linked to that keyword by a user. In bold, the last selected keyword.



Free text search

Selecting this item opens a text box and a Search button. The user may enter a single word, or part of it, in the textbox, and press the button. A list of the indicators containing the word in any of their fields will be shown.

The search is not case-sensitive, but spaces are important. Entered text is considered as a whole and not split into tokens. Two or more words might be searched for, but keep in mind that "sust" will match "sustainable" and "sustainable farming", but "sust farm" or "sustainable farming" (with two spaces in-between) will not match anything.



3. Database structure

3.1. Overall view on the DIS database

Entities and tables

The DIS application has been built over a MySQL database, made up from a set of **tables**.

Let's consider, for example, one table: Bibliography. A **table** is a database schematization of a "class" (i.e. **the** scientific paper), which represents a set of objects (i.e. all the scientific papers related to LADA project). Each **field** (or column) of the table describes a property of that class (i.e. Authors), and each **record** (or row) of the table represents a single object belonging to that entity class (i.e. **one** particular paper).

Relationships

A relationship is a semantically defined link between **two tables**. Only two types of relations are used in DIS database:

Only two types of relations are used in DIS database:

- **One to many**: each record from the first table can be linked to zero, one or more records from the second table. An example is "Project member owning Indicator": each project member may own different indicators, but each indicator may belong to one and only one member. This also implies that a Project member **may** own no indicators, but an indicator **must be owned** by a project member.
- **Many to many**: each record from the first table can be linked to zero, one or more records from the second table, **and vice versa**. An example of a many to many relationship is "Indicator belonging to an Indicator group": each indicator may belong to different groups, and each group may have different indicators.

Constraints

Constraints are additional rules that protect database integrity. Referential rules, as those seen before, constitute an example of constraints.

Field-level constraints might state that a certain field in a table cannot be empty, or must contain a value defined in a specific **domain**, or must be an integer number greater or equal to 0 and lesser or equal to 100.

3.2. Indicators

Basic concepts

Indicators are the main entity in the DIS database. Each indicator is stored in a row (one record) of the Indicators table, and may be linked to all other tables of the database.

Description of table fields

DEFINITION SECTION	
Name	Indicator's official name, uppercase.
Brief definition	A brief definition for the indicator.
Units	Units of measure used to quantify the indicator.
Other definitions	Other definitions available for the indicator (if any)
Country	Country in which the indicator has been defined (LADA project only)
Keywords	A list of keywords related to this indicator (if any)
CLASSIFICATION SECTION⁴	
Operational objectives	Mitigation, Monitoring or Prevention
Position within D.P.S.I.R.	Driving forces, Pressures, States, Impacts or Responses
Min spatial scale	Station, Local, Intermediate, sub-national to national, Regional
Max spatial scale	The same as above, but it cannot be "lesser than" the minimum one. If no range for spatial scale must be defined, this value must be null.
LADA spatial scale	LADA spatial scale
Min time scale	Daily or more frequent, Monthly or seasonally, Annual, Every 1-5 years, or Every 5 years or more.
Max time scale	Same as above, but it cannot be "lesser than" the minimum one; if minimum time scale is set to "Every 5 years or

⁴ Explained in detail in the Appendix.

	more", or no range has to be defined, Maximum time scale must be null.
Compon. involved	Climate, Socio-economic aspects, Soil, Vegetation, Water resources
Type of data	Data banks, Field or Remote sensing data
Classification	This field shows the resulting formula calculated from the previous fields, as defined in the Appendix. It cannot be edited.
<i>METHODOLOGICAL SECTION</i>	
Importance with respect to LD	Importance with respect to LD and Desertification. How this indicator can contribute to the assessment/monitoring of LD, in which conditions and contexts.
International conventions and agreements	International conventions and agreements, other than UNCCD, to which the indicator may be relevant.
Definition and basic concepts	Extended definition highlighting the conceptual bases and theoretical assumptions behind the indicator.
Benchmarks	Benchmarks, reference values or thresholds to be used to interpret the indicator values in relation to the specific objectives.
Methods of measurement	Detailed explanation of the specific methods of measurement to be applied.
Limits of the indicator	Methodological limitations of the indicator, constraints, drawbacks.
Related indicators	Linkages to related indicators; they can be edited with the *indicators link*.
Region of development and test	Geographical area, region, where the indicator was first developed and tested.
Groups of related indicators	A list of all the groups the indicator belongs to. This table can be edited with the *groups link*.
Data required for calculation	Data requirements according to the methodology described above.
Data sources	Typical data sources which can be exploited in relation to the above requirements, e.g.: direct field survey if the data are not normally available; country statistic records; RS databanks, etc.
Data availability from national and	Actual, specific availability of the required data from national and international sources. To be filled in when specific targeted info are available allowing the user to

international sources	easily retrieve and get the suggested data.
Authors	Author names.
Author's email	Author's email.
Contacts	Other contact details (mail address, etc.).
Other authors	Contributing authors (if any).
Bibliography	A list of all the bibliographic references which are related to the indicator. This table can be edited with the *bibliography link*.
Other references	Other references (if any).
Ext. page URL	External page URL.
Notes	Free text notes (if needed).
Record status	Record status: Proposal or Approved. Proposed indicators must be approved by the project administrator for being published.
Project	Project to which the indicators belongs: DIS or LADA.
Visibility	Visibility: DISforME indicators can be made visible in DISforLADA project and viceversa.
Date	Date the record was last modified.
Inserted by	User who created this indicator record.

List view and "List by"

In List view, only indicators' name are shown. As mentioned in paragraph 1.1, through the *List by* tool indicators may be grouped and listed by: *Operational objectives*, *Position within D.P.S.I.R.*, *Component involved*, *Type of data*, *Inserted by*, *Min spatial scale*⁵, *LADA spatial scale* and *LADA country*.

Links with other tables

The following "*many to many*" relations can be edited from Indicators detail view:

- **Indicator groups:** for linking an indicator with a group, the role of the indicator must be specified among its possible values: Compound indicator, Participant, Term for calculating a compound indicator (index).

⁵ Both spatial and temporal scales are to be defined, in principle, as a range. If applicable, both minimum and maximum values can be defined, by choosing one of the reference values available (these are discussed in the Appendix).

- **Keywords:** the user can link the indicator to existing keywords, or create a new keyword and link it at once.
- **Bibliography:** the user can link the indicator to existing references only. If needed, first add the reference from the Bibliography table.

3.3. Indicator groups

Basic concepts

Groups define Indicator's sets according to the following criteria:

- **Thematic** groups: they group otherwise unrelated indicators.
- **Compound** indicators groups: they group all the indicators which are needed to calculate a compound indicator (index).
- **Alternative** indicators groups: they group different indicators which can fit the same purpose.
- **Concurrent** indicators groups: they group indicators which are computationally unrelated, but might form a logical or computational chain in complex scenarios or problem solving situations.

Description of table fields

Description	Name of the group; it is intended to give also a brief description of it
Group type	One of these possible values: Alternative indicators, Compound indicator, Concurrent indicators or Thematic group
Visibility	A group can be visible only in the project where it was created, or can be transversal (i.e. visible in both DISforME and DISforLADA) if it may be relevant to more than 1 project
Keywords	A list of keywords related to this indicators' group
Date	Date the record was last modified
Inserted by	User who created this indicators' group
Related indicators	Indicators belonging to this group

List view and "List by"

List view shows the group name, along with a list of the indicators belonging to it.

Records may be grouped and listed by: Group type.

Links with other tables

The following "*many to many*" relations can be edited from the **detail view** of Indicator groups:

- **Indicators:** in order to link an indicator with a group, the role of the indicator in it must be specified. Possible roles are: “Result” of a compound indicator, “term for calculating” a compound indicator, or simple “participant” of a thematic group.
- **Keywords:** the user can link the group to existing keywords, or create a new keyword and link it at once.

3.4. Bibliography

Basic concepts

The Bibliography table contains all the bibliographic references for the DISforME/DISforLADA project.

Description of table fields

Title	Title of the document.
Authors	Author names.
Year	Year of publication.
Type	Type of publication, one of the following values: Book, Paper from scientific journal, Proceedings from symposia, Web site, Other
Reference	Publication, book or collection of papers which contain this document, if any.
Keywords	A list of keywords related to this bibliographic reference
Web address	Web address
E-mail	Authors contact E-mail

Phone	Authors contact phone number
Fax	Authors contact Fax number
Related indicators	Shows related indicators. The association between indicators and bibliography can be modified only when editing indicators.
Inserted by	User who created this bibliographic reference

List view and "List by"

Authors and title are listed in list view. Records may be grouped and listed by: Year, Type, Inserted by.

Links with other tables

The following "*many to many*" relations can be edited from Bibliography:

- **Indicators:** many indicators can point to the same bibliographic reference, and each indicator may have more references. This link can be edited only from within indicators detail view. Before editing this link, however, user should be sure that the required bibliographic reference exists in the database.
- **Keywords:** the user can link the reference to existing keywords, or create a new keyword and link it at once.

3.5. Keywords

Basic concepts

Keywords are simple text strings which may be linked to indicators, indicators' groups and bibliographic references: the same keyword can be linked to different records in different tables.

Although every user can add keywords, it is advisable that each new keyword is proposed and discussed before being added to the database.

Description of table fields:

Keyword	The keyword text. May be composed of many words, in which case a consistent style should be used: "soil quality" or "quality, soil" are an example of different styles
Type	Keyword type, one of the possible values: Country, Keyword, Sub-Issue.

	Country indicates a geographical context, Keyword a simple keyword, Sub-Issue indicates a keyword which must be used along with desertification issues, as “specifier”
Date	Date the record was last modified
Inserted by	User who created this keyword

List view and "List by"

Keywords are simply listed by keyword name, and can be grouped and listed by: Type, Inserted by, Initial.

Links with other tables

Keywords can be linked with: **Indicators**, **Indicator groups** and **Bibliography**. Links must be edited from these tables, and cannot be accessed from the Keywords table.

3.6. Project members and system administration

Basic concepts

Project members are the registered users of the DIS system, and their detail information is stored in the *Project members* table.

Each user is given a permission level for each DIS project, which can be:

- **guest**: read only access;
- **user**: add new indicators (proposals); modify or delete his own records;
- **project administrator**: same privileges as user, *plus*: create users and give them user rights; modify all the records in the project (even those from different users); approve proposed indicators; add keywords;
- **system administrator (root)**: same privileges as administrator, but not limited to the current project; give users project administrator rights.

Most registered users belong to one project only (DIS or LADA), and so behave as "guests" (read-only) when logging on the other project. Anyway, registered users are always able to access the project members list and detail for the current project.

Non-registered guests don't have access to the project members table in the database view.

Editing user account

Each user have access to his own record using the **my account** link. This function can be used to maintain contact information up to date, or to change one's password. Administrators can modify account data for other non-administrator users.

Changing password

The **Change password** command can be used to change a user's password. Users can change their own password. Project administrators can change the password of all the non-administrator users belonging to their project. The current password (for the logged-in user) must be entered in the Your Password field; the new password is entered in the *Retype new password* field and confirmed by retyping it in the New password2 field.

Adding new users and modifying user permissions

Only project administrators can add new users and modify their permissions. A new user can be created with the Add new command. By default the password will be set equal to the login name, so it should be changed immediately after user creation. Administrators can set user permissions for the current project only and up to a "user" level; only **root** can promote or demote administrators.

Links with other tables

When an user creates a new record, his user ID is automatically put in the **Inserted by** field.

DIS DATABASE USER MANUAL

APPENDIX

On the classification of LD indicators as implemented in DIS4LADA

1. Introduction

The OECD (1997) defines an environmental indicator as “a parameter, or a value derived from parameters, that points to, provides information about and/or describes the state of the environment and has a significance extending beyond that directly associated with any given parameter value.”

We can say that an indicator is a parameter, or an index⁶, providing concise and clear-cut information on a process it is sought to characterise, measure and monitor, and thus with reference to a specific objective.

An indicator contains quantitative information that helps to explain how processes evolve over time and vary in space.

An environmental indicator in particular provides information on the status and the trends of the state of the environment, of human activities influencing or being influenced by the environment and on the interactions between these two variables. (Gentile, 1998).

The distinction between parameters (sometimes also called “variables”) and indices should be pointed out: usually these terms are used to indicate respectively, a unit of primary or un-processed information (measured directly, therefore dimensional) and a unit of derived information (typically a-dimensional).

The parameter value, is the direct result of a simple and standardised measurement of a physical quantity, whereas the derived information, the index, is the result of a mathematical operation applied to the primary variable (for example a mathematical average), or on several variables at the same time (for example a ratio).⁷

⁶ We give the term “index” its general and most widely used meaning in scientific disciplines, i.e. “generally a-dimensional numeric quantity used to indicate a physical scale of magnitude” or more simply, a value derived from parameters.

⁷ The distinction is not always clear (probably more a conventional one) and it depends on the context. In fact even “primary” information can be sensitive to the tool and to the conditions of measurement or can require pre-treatment. For example with respect to a spot measurement of soil pollution undertaken according to widely used standardised methods, the data exists only as an average of several measurements; for some applications the temperature measurement itself is calibrated according to the type of thermometer and the conditions of measurement. Perhaps it could be said that the main difference lies in the different quantity of “meta-information” (information on the data) which completes and describes the data.

The term index also has another meaning, more commonly used in economics and statistics, where index provides highly aggregated information specifically designed to indicate in a synthetic but exhaustive manner the dimension of a state or process. In this sense of the term, indices are generally obtained from an aggregation of indicators: several indicators can be identified in relation to a given process and a single index obtained from the aggregation of these.

A few further considerations of a general order are required to clarify the role and the characteristics of environmental indicators:

1) bio-physical parameters that are easily and accurately measurable, cost little in terms of acquiring and processing data, are rich in information, and can therefore be considered truly efficient as indicators, are not so many.

2) Some of these can be highly significant, from many points of view, i.e. the same parameter or index can be a pertinent indicator of many relevant environmental aspects; for example, “% of organic matter soil content” is considered a significant indicator at least with respect to all the subjects listed below:

- general soil fertility
- soil moisture retention capacity
- soil structural stability and erodibility
- presence and biodiversity of edaphic fauna
- carbon cycle and potential for sinking atmospheric carbon dioxide.

This list illustrates some of the main functions attributed to the parameter in relation to soil ecology, sustainability of agro-ecosystems, balance of the biosphere.

3) Consequently what identifies a parameter or an index as an indicator (*indicating something specific*) is a set of characteristics, amongst which:

i) Objective: an indicator is such when it serves to characterise/measure/monitor a state or process in a determined context, for a specific purpose;

ii) Method: the method of measurement and/or calculation of the value of a parameter/index; level of accuracy required, number of repeats, periodicity, statistical processing, fields and contexts of application, spatial scale at which it is significant;

iii) Benchmarks of the parameter/index: (threshold values, reference intervals, etc., needed to interpret the indicator values in relation to the objective)

iiii) Type and quality of the final information; site-specific or distributed spatially; specific techniques for space/time interpolation of point data, accuracy required, etc.

To conclude, it could be said that an environmental indicator is not just a parameter/index, but a set defined by at least the following elements:

- parameter/index itself;
- specific objective;
- method of measurement;
- benchmarks;
- spatial and temporal scales
- type and quality of information input/output.

Considering the soil organic matter example, if we switch from one specific objective to another, we may expect that different specific methods, benchmarks, accuracy would be most appropriate.

A single soil property can thus originate several different indicators.

For this reason, the following paragraphs explain how the indicators must be characterised in relation to some major *classification criteria*.

These criteria have been implemented in DIS4ME/DIS4LADA. They constitute an essential part of the *indicator FACT SHEET*, which is, in turn, the complete set of methodological information needed to transform an indicator into *a tool ready to be used*.

2. Classification of LD indicators

There are numerous potential LD indicators. They are very heterogeneous, and could be classified according to various criteria.

Several criteria often coexist in hierarchical order in a single classification. The fact that there are many plausible criteria reflects the existence of issues at many different levels.

In the more classical approach, indicators are classified by first sub-dividing them into socio-economic and biophysical categories and the latter are then subdivided into climatic, soil, water, vegetation, biodiversity related, etc. In other words, indicators are usually organised and classified so as to reflect the fields of competence of individual disciplines and the experience gathered in specific experimental contexts.

In the specific programmes launched by various international or national agencies on the subject of environmental indicators, the need to resort to conceptual frames of reference arose, to ensure a more efficient organization of knowledge and greater ease of communication. This is how what the UN documents refer to as “assessing and reporting frameworks” came into being, amongst which the PSR (Pressure State Response) probably the best known.

The structure of these systems reflects conceptual model used to describe the complexity of the processes under study. Such systems, therefore, are not simple methods of classification but working tools.

The **DPSIR** (Driving force / Pressure / State / Impact / Response) is well known to LADA partners.

Introduced by the European Environment Agency as a basis for their programme on environmental pressure indicators, it is evolved from the PSR model, where two further elements of the chain are identified: the driving forces that determine pressures and the direct impacts of degradation of the state on society, impacts which in turn induce the feed-back.

Other criteria are sometimes used: for example in institutional contexts, indicators may be classified primarily according to the economic-institutional sector involved (agricultural, industrial, commercial policies...).

3. The classification framework implemented in DIS4LADA

The framework implemented in DIS4LADA is composed of five hierarchical levels, corresponding to as many indicator classification criteria. They provide an answer to the questions “what is it for”, “at what scale does it apply”, “what kind of data is it based on”.

These information are also essential part of the *indicator fact sheet*. It indicates and describes all the information necessary to qualifying an indicator as such and as a ready to use tool.

The five classification criteria are, in hierarchical order:

1. *Operational objectives;*
2. *Position within the DPSIR framework;*
3. *Spatial scale and time scale;*
4. *Component of the environmental or socio-economic system involved*
5. *Type of data and acquisition platform*

For each of these criteria a few subclasses are indicated, identified by a letter in bold type.

An indicator can thus be codified by a sequence of letters referring to the five subclasses they belong to. For example an indicator of type (P,S,L,V,R) is an indicator for Prevention, of State, applicable on a Local scale, referring to Vegetation, measurable by means of remote-sensed data.

In DIS4LADA, such a formula is generated automatically once the sub classes are defined by the user.

1. *Operational objectives;* by “operational objectives”, reference is made to prevention (**Pr**), monitoring (**Mo**), mitigation (**Mi**).

Indicators are sometimes grouped together according to the objectives for which they have been designed. As an example, in some documents referring to “UNCCD impact” indicators, such objectives reproduce the major issues defined by the UNCCD:

- knowledge of and monitoring of LD and drought processes;
- conservation, rehabilitation and sustainable management of natural resources;
- increased production and amelioration of living conditions;
- combating poverty;
- improvement of institutional organization

Alternatively, as DIS4LADA does, the classification can fulfil the three operational objectives of the struggle against LD, i.e.

- Prevention
- Monitoring
- Mitigation

Indicators targeting *prevention* should be based on an understanding of the degradation processes and of their causes. Those detecting how human activities degrade the environment are mostly of a socio-economic and cultural nature. Those linked to concepts of *vulnerability*, *sensitivity*, intrinsic *resilience* of natural systems with respect to processes causing degradation are mainly of a biophysical nature. They are both socio-economic and biophysical when the question of prevention is tackled from the point of view of *sustainability* of land use management.

Monitoring indicators should describe the status of natural resources or of the socio-economic systems that interact with them, and inform on the dynamics of evolution at different scales of temporal observation. These indicators must also assign a value to such dynamics, so they are linked to concepts such as *quality* or level of degradation which in turn may be linked to an evaluation either of the functional or absolute kind (i.e. referring to an ideal model of a perfect ecosystem) of the value of ecosystems. There are a great many indicators of this type, of very different origin (depending on the “what” and the “how” being monitored).

Indicators designed for *mitigation* may be regarded as indicators of the impact of activities implemented by man to alleviate the effects of LD and drought (they will therefore serve to decide on the necessity and efficiency of mitigation measures).

This family of indicators must be closely linked to the notion of *functions of an ecosystem*, in as far as it is assumed that every mitigation measure is aimed at reviving one or more of the environmental functions to which society attaches a value and which have to some extent been compromised. It may be possible in future to determine common sets of mitigation indicators once agreement is reached concerning what functions of natural ecosystems should receive priority attention and to the extent to which these functions are controlled by a limited number of universally valid factors (for example if the scope of a reforestation measure is only to reduce erosion risk, the evolution over time of the vegetation cover percentage is a simple but universally valid indicator).

Obviously certain parameters can be indicators for each of the three objectives, but the manner in which they will be considered, the methods of measure, the benchmarks, etc. may be different..

2. *Position within the DPSIR (D,P,S,I,R).*

As suggested by the LADA methodological framework, it is very important that the indicator be characterised in this way, because it presupposes a knowledge of the context (the physical and socio-economic system) within which the indicator was developed, its components, the interactions between them, the mechanisms causing degradation. It is an encouragement to adopt a comprehensive, multidisciplinary and integrated vision of the issues at stake.

Together with the context, the specific objectives of the indicators will be better defined too.

3. *Spatial scale and time scale*

The necessity of identifying indicators applicable to different spatial scales and to different environmental contexts is one of the fundamental problems of research on indicators. Indicators are often site-specific and not comparable; indicators focussing on processes are generally defined for a single spatial scale, but in some cases it may be demonstrated that a property of a system which at a scale of detail appears to be negative may be positive at a smaller scale. At other times, indicators at different scales are selected, but the relationships between the different scales of the environmental system are not clear, and consequently the resulting set of indicators cannot effectively be used to assess the state of degradation of the overall environmental system.

In general, with the same objective, different indicators are applied to the different spatial scales.

This is why indicators are often grouped together according to homogeneous scales. However, there is more than one way of subdividing spatial scale, either special to the different scientific disciplines or linked to specific objectives and /or to particular working tools (for example the different remote sensing platforms). Furthermore, systems based on criteria of physical regional sub-divisions are not really compatible with those of the geo-political type.

Spatial scale (S, L, In, Sn, Re)

One of the major problems in this respect is to determine intervals of scale able to represent both geopolitical processes (scale / geopolitical spatial levels) and physical ones (physical, regional divisions), especially as there are no universally accepted classifications either for one or the other.

In DIS4ME/DIS4LADA, for physical regional sub-divisions, the framework proposed by Mitchell, 1991 (reproduced in figure 1) was used as a reference, for the geo-political sub-division reference is made to certain administrative units.

The scales proposed are the following:

Station, Local, Intermediate, sub-national to national, Regional.

An indicator may be assigned to a given scale on the basis of the following criteria:

- a) the indicator “functions” only for specific contexts that can be identified or delimited only at a certain level of detail;
- b) the indicator needs data with a level of accuracy such as to require measurements and surveys above a certain level of detail.

- **Station (S):** indicators designed for studying extremely localised processes, for example, soil contamination by heavy metals in the proximity of a point source of pollution; their applicability can be linked to a specific context (for example to assess the behaviour of a certain type of contaminant in a certain type of soil, in well-determined microclimatic conditions); they require accurate and specific data, the validity of which is generally confined to the narrow field of the area under study. They are essentially indicators of state of a biophysical nature. The metric scale of reference can vary from very large scale of detail to large scale in the order of 1:5000.

Physical units recognisable at this scale (Mitchell, 1991): land element; land sub-facet.

Corresponding administrative unit.: cadastral plot.

- **Local (L):** Indicators designed to provide a detailed description of the mechanisms of LD processes in local contexts, (possibly in areas characterised by a high level of internal homogeneity), with particular reference to pressure factors, to the dynamics of the state of resources, to impacts on local populations. Often the local system cannot take the driving forces and response into consideration, nor the indirect impacts and the off-site impacts. Their applicability can be linked to a specific context (for example the study of “erosive processes on marly soils destined for extensive pasture”), or they can have a more general validity (for example a generic indicator of soil erodibility), but require a level of spatial detail such as to require measures and surveys with a level of detail of the local type. The metric scale of reference can vary from the large, in the order of 1:5000, to medium scale (1:50000).

Physical units recognisable at this scale (Mitchell, 1991): Land clump; land facet.

Corresponding administrative unit: municipal

- Intermediate (**In**): Indicators to describe the mechanisms of LD processes on a broader geographical scale than the local, characterised by a lesser degree of internal homogeneity (for example, indicators for a process at work on the scale of a catchment area which includes various kinds of landscapes) but which call for data with a level of accuracy that could not rationally be managed at a scale of lesser detail. Generally at this scale, which is the most important for land use planning, all the system of causes (DPSIR) determining LD processes can be described and each of the components, both bio-physical and socio-economic are manifested with equal importance, just as all the disciplines and data sources make a potentially equal contribution. The metric scale of reference can vary from medium scale in the order of 1:50000 small (1:200000).

Physical unit recognised at this level (Mitchell, 1991): land clump; land facet, land catena.

Corresponding administrative unit: district or province.

- Sub-national to national (**Sn**): these indicators are less appropriate for describing processes in all their complexity because the description of the natural components, in particular, at this scale becomes very simplified. It is a scale at which many indicators are defined for monitoring by means of remote sensing. The socio-economic component acquires increasing weight at this level, so this scale is suitable for indicators of driving forces, impact and response. The metric scale of reference is small, included between 1:200000 and 1:1000000.

Physical units recognised at this scale (Mitchell, 1999): land system (simple); Land region.

Corresponding administrative unit: country region to country.

- Regional (**Re**): At this scale considerations regarding the regional scale also apply, with an even greater importance given to economic factors of the structural type. Moreover, at this scale it becomes possible to take into account global processes, whether globalisation of markets or global climate change. The metric scale of reference is very small, below 1:1000000.

Physical units recognised at this scale (Mitchell, 1991): land region; land Province.

Corresponding administrative unit: national or supra national.

Time scale (**d, m, a, b, c**)

At least two pieces of information are required to characterise an indicator in terms of time-scale:

a) The lapse of time required for the indicator to provide the expected information.

Some indicators are designed to describe properties of a system under study that can reasonably be considered constant in time, like a slope, so the measurement can be made once and for all. Others measure properties whose averages are constant in time, so the final value of the indicator will be a mean value taken over a more or less long period of time (for example the climatic characterisation of a station requires a series over a thirty years period). Others measure properties that vary in time and at different speeds and the purpose of the measurement may be to compare the present value with a reference threshold or to determine the trend: these objectives can require very different time-spans. For example some degradation processes are very slow and must be assessed over a lapse of time in the order of about 10 years, while the average time required to evaluate the success of a reforestation measure may be of approximately 10^2 years. The time required for the regeneration of highly eroded soils in dry climates can be in the order of 10^3 years.

b) The frequency of measurements required to obtain information.

In addition to the total time required to obtain the final data, the frequency with which measurements have to be repeated is sometimes quite different, and can be hourly or more (for example to measure the instantaneous energy of precipitation), daily, seasonal, annual, etc. according to the specific requirements of individual indicators.

Obviously, for a classification designed to be practical there is no point in taking all possible cases into consideration and therefore we have restricted ourselves to a very much simplified classification, based exclusively on the frequency of measure, so as to give the user an immediate idea of the magnitude of the indicator's needs in terms of data sampling. The classes identified, designated this time by a lower case letter, are the following:

Very frequent, daily or more (d); monthly or seasonally (m); annual (a); Every 1-5 years (b); Every 5 years or more (c).

Figure 1. Hierarchical classification of terrain, soil, and ecological units (Mitchell, 1991).

Hierarchical classification of terrain, soil, and ecological units					
<i>Terrain unit</i>	<i>Definition</i>	<i>Soil unit</i>	<i>Vegetation unit</i>	<i>Mapping scale (approx.)</i>	<i>Optimal remote sensing platform</i>
Land zone	Major climatic region	Order	—	<1:50 000 000	
Land division	Gross continental structure	Suborder	Plant pan-formation; <i>zone écologique</i>	1:20 000 000 –1:50 000 000	Meteorological satellites
Land province	Second-order structure or large lithological association	Great group		1:5 000 000 –1:20 000 000	
Land region	Lithological unit or association having undergone comparable geomorphic evolution	Subgroup	Sub-province	1:1 000 000 –1:5 000 000	Landsat SPOT ERS
Land system (simple) *	Recurrent pattern of genetically linked land facets	Family	<i>Région écologique</i>	1:200 000 1:1000 000	Landsat SPOT, ERS, and small-scale aerial photographs
Land catena	Major repetitive component of a land system	Association	<i>Secteur écologique</i>	1:80 000– 1:200 000	
Land facet	Reasonably homogeneous tract of landscape distinct from surrounding areas and containing a practical grouping of land elements	Series	Sub-formation; <i>station écologique</i>	1:10 000– 1:80 000	Medium-scale aerial photographs, occasionally SPOT and Landsat
Land clump	A patterned repetition of two or more land elements too contrasting to be a land facet	Complex	Sub-formation: <i>station écologique</i>	1:10 000– 1:80 000	
Land subfacet	Constituent part of a land facet where the main formative processes give material or form subdivisions	Type		Not mapped	Large-scale aerial photographs
Land element	Simplest homogeneous part of the landscape, indivisible in form	Pedon	<i>Élément de station écologique</i>	Not mapped	

* A land system can be complex if it represents a combination of two or more geomorphogenetically related simple land systems, or compound if the combination is not geomorphogenetic. Complex and compound land systems are appropriate to the mapping scale of the land region.

Sources: soil units, USDA (1976); vegetation units, Howard (1970c), Long (1974).

4. *Component of the environmental or socio-economic system involved (C, S, W, V, SE)*

Here the traditional classification of indicators into the following categories is used:

Climate (**C**); soil (**S**); water resources (**W**); vegetation (**V**); socio-economic aspects (**SE**).

5. *Type of data and acquisition platform (B, F, RS)*

Indicators are often grouped together according to the tools used for acquiring data and sometimes according to measurement techniques.

The types of data are grouped into three major categories to help the user to immediately identify the type of data required by the indicator and consequently, to see at once whether it is available or not and at what cost:

- From data banks (**B**): data commonly found in the data banks of many governmental agencies or research institutes, such as data on climate, demography, socio-economic data and also other types, for example from mapping data banks, like the FAO Map of the Soils of the World, in case work is being done on a very small scale and that direct acquisition of data is totally out of the question.
- Field (**F**): data to be gathered by special data collection campaigns, either of the punctual or mapping type, when it is not already available.
- Remote sensing data (**RS**): with reference only to aerial photographs and satellite images.

6. *“LADA key Assets” (under development)*

This category exists only for LADA project. It includes: Soil Health; Biodiversity; Water Q&Q; Land Cover/Carb Biomass; Renewable Goods; Cultural Services.

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Recapitulative table of the classification codes:

Criteria		Classes and relative codes				
<i>Operational Objective</i>		prevention	monitoring	mitigation		
		Pr	Mo	Mi		
<i>Position in the logical framework</i>		driving force	pressure	state	impact	response
		D	P	S	I	R
<i>Scale</i>	<i>space</i>	Station	local	Intermediate	sub-national to national	Regional
		S	L	In	Sn	Re
	<i>time</i>	daily or more	monthly or seasonal	annual	Every 1-5 years	Every 5 years
		d	m	a	b	c
<i>Component of the system under consideration</i>		soil	water resources	vegetation	climate	socio-economic aspects
		S	W	V	C	SE
<i>Nature of data</i>		in data banks	direct gathering	remote sensing		
		B	F	RS		

Automatic creation of the synthetic “formula” by DIS4LADA.

Example:

Indicator for prevention, state, spatial scale local to intermediate, time scale seasonal, referring to vegetation cover, remote sensing data;

objective	dpsir	scale (s)	scale (t)	component	data
P	S	L/In	m	V	RS

NOTES:

Both spatial and temporal scales are to be defined, in principle, as a range.

If applicable, both minimum and maximum values can be defined, by choosing one of the reference categories (letters) available.

The system will put a slash between the two values, defining the corresponding range.

Within LADA project, the system substitutes DIS4ME spatial scale with LADA spatial scale.