EU LIFE Programme project
"Demonstration of climate change mitigation potential
of nutrients rich organic soils in Baltic States and Finland"

Annex 2

User manual for the model "Functional land management model - a tool for climate change mitigation and sustainable management"

1. About the model

The model is developed in the MS Excel environment using the following tools:

- Standard tools for creating tables and performing calculations using calculation algorithms available in the MS Excel;
- Visual Basic application (VBA), which is used to automate the operation of model calculation algorithms.

The model has a structure in which the following spreadsheets are responsible for performing certain functions related to the operation of the model:

- Data entry spreadsheet (title "Data_entry"), in which the land type of the land plot to be assessed is selected;
- Results spreadsheet (title "Results"), which outputs the results of the scenario being evaluated;
- Help spreadsheet (title "Help") showing the model user guide;
- Threshold checklist (title "Limit_values"), which shows the thresholds of the selection criteria required for the implementation of the scenarios;
- Additional data entry spreadsheet (named "Additional_data_entry") with links to data entry pages for individual scenarios;
- Model section spreadsheets (page titles consists of the section number and the text "section"), in which the verification of the selected land types (page "0.section") and the selection criteria limiting the operation of the scenarios is performed;
- Model language spreadsheets (page titles consists of the section number and the text "language"), in which the translated text necessary for the operation of the model is entered. The model supports up to five different language versions. The translated text is entered exclusively in the spreadsheet's columns D: H (also in the blank white fields);
- The following four spreadsheets are used in the model to describe each calculation scenario:
    - Scenario data entry spreadsheet (the page title consists of the scenario number and the text "data_entry"), in which the data required for calculations are entered. Data entry is password protected and performed by the model administrator;
    - Scenario language spreadsheet (the page title consists of the scenario number and the text "language"), in which the text required for the operation of the specified scenario is entered;

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- o Scenario calculation spreadsheet (the page title consists of the scenario number and the text "scenario"), in which the calculations related to the implementation of the scenario are performed. No information is entered or other changes are made on the page, except when the model is improved, for example, by changing the calculation algorithms;
- o Scenario output output spreadsheet (the page title consists of the scenario number and the text "results"), in which the scenario calculation results are output.

Model performance limitations

The model has the the following limitations related to the operation of the MS Excel:

- Any changes that take place outside the intended cells (colored in yellow), incl. adding or deleting new rows, can cause permanent model errors;
- Model protection (macro code, separate spreadsheets) is limited by the technical capabilities of the MS Excel software.

2. Data entry

Additional data entry

Additional data entry is performed by activating the "Additional data entry" menu on the model's index page (spreadsheet "Data entry") and entering the access password.

Additional data entry allows to enter data required to evaluate individual model scenarios or changes to data already entered. Additional data entry takes place exclusively in the yellow colored cells of the data entry spreadsheet for individual scenarios.

The model provides the following two types of data input:

- Numerical values (revenues, costs, time cycle reference values);
- References for attributing certain costs (YES / NO options for attributing maintenance and renewal costs).

The names of the cost items required for the calculation (the model provides for the input of a maximum of five sub-items) are added to the language page of the respective scenario (using the relevant yellow cells). Important: cost item names must be added or deleted for all language versions added to the model at the same time.

When you have finished entering data required for calculations, select option 1 in cell B5. In cases when the amount of data entered is not sufficient for correct calculations, select option 2 in cell B5, thus disabling calculations for the specified scenario (which will be reported to the model user by the respective text message).

Entry of language versions

The model supports the five different language versions. The translated text is entered exclusively in the following model spreadsheets:

- Spreadsheet "0.languages". On this page, the text (buttons, menus, explanatory texts) necessary for the operation of the model is entered, incl. text that applies to all scenarios, such as individual scenarios in the "Data Entry", "Scenarios" and "Results" spreadsheets;
- Spreadsheet "1.languages". On this page, the text specific to the land type "Agricultural land" is entered;
- Spreadsheet "2.languages". On this page, the text specific to the land type "Forest land" is entered;
- Spreadsheet "3.languages". On this page, the text specific to the land type "Wetlands" is entered;
- Scenario language spreadsheets (with indices 1.1 - 1.7, 2.1 - 2.9, 3.1.a., 3.1.b.). On these pages text specific to certain scenarios is entered.

Access to spreadsheets "0.languages", "1.languages"; "2.languages"; "3.languages" is only possible by using the model's macro settings, which are activated with the key combination "Alt + F11" or by activating the View> Macros tab. The model macro settings are located in the "VBAProject "*model's file name*" folder, which is password-protected and can be found at the Project Explorer window, which is activated by going to the View> Project Explorer tab or activating the key combination " Ctr + R ". To open the model language spreadsheets, open the Properties Window (by going to the View> Properties Window tab or activating the F4 key) and activate the specified spreadsheet in the Microsoft Excel Objects folder (in the Project Explorer window) by clicking on it with a left mouse button. In sequence, select the "-1 -xlSheetVisible" option in the "Visible" section of the "Properties Window". When you have finished entering text, close the open language spreadsheets by selecting the "2 - xlSheetVeryHidden" option in the "Visible" section of the "Properties Window".

To add an additional language version, use the following steps:

- In the "0.languages" spreadsheet, enter the name of the language version to be entered in the next blank cell of the range B7: B9. The same name must also be entered in the appropriate cell of the range F1: H1, replacing the name entered there, for example "Language version No.3", with the name of the language version to be entered;
- The translated text must be entered in all language input spreadsheets (language version 3: column F, language version 4: column H, language version 5: column G). The text must be entered according to other language versions, such as the lines of text entered for the English version;
- Add the language version you have entered to the language menu by following these steps:
  - Activate (by right-clicking the mouse buton) cell C4 in the spreadsheet "0.languages";
  - Go to the Data> Data validation tab and select the Data validation option. In the window that opens (on the Settings tab), select the List option from the Allow menu, and when activating the Source menu (by right-clicking the up arrow icon), select the range from cell C5 to cell (including that cell) that

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matches the name of the language version you have added, such as C5: C7, if language version 3 is added, and click OK.

Important:

- Do not modify tables created in spreadsheets by adding or deleting rows and columns there;
- Editing options for individual scenarios language pages are password protected. To unlock a spreadsheet, right-click the spreadsheet title tab in the toolbar at the bottom of the window, select Unprotect Sheet, and enter an access password. When you finish entering text, set the spreadsheet protection by selecting the Protect Sheet option;
- When entering data in language spreadsheets, please follow the descriptions which are added in column A;
- Files containing macros do not allow data to be copied from other MS Excel files. Therefore, if you need to copy information from an MS Excel file, please use the MS Office tool Notepad (before transferring the data to the model file spreadsheets, convert it using Notepad).

3. Model transformation

Modification of the model is possible in the following two ways:

- Modification of model control and automation algorithms by changing the VBA macro code;
- Modification of model calculation algorithms by changing the calculation algorithms to be performed in model spreadsheets using the MS Excel standard tools (table creation, formula input).

Modification of model control and automation algorithms

By changing the VBA macro code, the model control and automation algorithm can be modified.

Important:

- When making changes, make sure that the changes you make do not change the position of the reference cells in the model spreadsheets that are required for the model to work. When necessary, associate macro actions with correct spreadsheet cells.

Modification of model calculation algorithms

By using standard MS Excel tools in individual scenario spreadsheets, the model's calculation algorithms can be modified.

Access to model scenario calculation and output spreadsheets is only possible through model macro settings. To open the model spreadsheets, open the Properties Window on the model's macro settings page and activate the specified spreadsheets in the Microsoft Excel Objects

folder (in the Project Explorer window) by left-clicking on them. Select the "-1 -xlSheetVisible" option in the "Visible" section of the "Properties Window" in sequence. When you have finished working with the spreadsheets, close the open spreadsheets by selecting the "2 - xlSheetVeryHidden" option in the "Visible" section of the "Properties Window".

Important:

- When making changes, make sure that linked pages (Data Entry, Languages, Scenarios, Results) are not affected.
- Changes to individual scenario spreadsheets are limited by the following conditions:
  - Scenarios 1.1. - 1.7. (land type: agricultural land) rows 1:50 cannot be changed (changes made in these rows may affect the correct operation of the model);
  - Scenarios 2.1. - 2.9. (land type: forest land) rows 1:34 cannot be changed (changes made in these rows may affect the correct operation of the model);
  - Scenarios 3.1.a., 3.1.b. (land type: wetlands) rows 1:52 cannot be changed (changes in these rows may affect the correct operation of the model).