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(Land Use / Cover Area Frame Survey)



Technical reference document C-4:
Quality Control procedures

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1 SCOPE

This LUCAS Reference Document addresses one of the most important topics within LUCAS: Data Quality Control. Below detailed instructions are given on which data and the way how data will be controlled, and by whom.

The current version of the document reflects the state of play on 12 February 2009 with regards to the Data Management Tool (DMT). Possible changes / additions of automatic control procedures embedded in the DMT will be taken into account in a next version.

2 THE ACTORS AND THEIR ROLES WITHIN THE DATA QUALITY CONTROL PROCEDURES

2.1 ROLE OF THE SURVEYOR (SU)

The surveyor's task is to carry out the field survey according to the LUCAS instructions. He is in charge to fill in the field form and keep it until the end of the survey respectively to hand it over to the regional/central office. Hereby, the surveyor needs to respect the instructions given during the surveyor training and those provided in the LUCAS documentation.

The surveyor has to enter the data in the Data Management Tool (DMT), to export the data and to forward the data to the responsible regional or central office of the field work contractor. The surveyor controls all data regarding completeness, correctness and consistency during data collection at the point and during data entry, including the correctness of the photos and the tracks. The built-in controls of the DMT support the surveyor in this task. Any problem or inconsistency identified during data entry or data export needs to be verified with the original field form and other means at hand and corrected immediately.

If there is a feedback from the regional/central office, the surveyor corrects or completes the data. If necessary to do so, he has to go back to the field and to survey the (missing parts of the) point again.

2.2 ROLE OF THE REGIONAL/CENTRAL OFFICES (RO/CO)

The regional/central office receives the data from the surveyor, including the photos and the GPS tracks. The RO/CO imports the data into the DMT and initiates the quality control. Since there are many built-in error correction features integrated in the DMT, data should be formally correct, complete and free of formal errors when received from the surveyor. This means that RO/CO shall concentrate

on the trueness of the data content (e.g. LC corresponds to the reality shown on the crop photo etc.). Detailed control procedures are listed in Chapter 3.

If any mistake or error is identified, RO/CO corrects the data directly if possible or returns the data to the surveyor and asks for correction / clarification. The RO/CO shall give advice and guidance to the surveyors on how to avoid in the future the type of identified mistakes or errors.

In the case of any formal or content error which cannot be corrected, it is mandatory to add a remark. If these remarks are missing, data will not pass the QC carried out by LuxSpace or Eurostat.

2.3 ROLE OF LUXSPACE

LuxSpace will have a similar role to play as the RO/CO: LuxSpace anticipates formal correctness of data and assumes that data already went through RO/CO quality control.

Almost identical cross checks are done as those specified for the RO/CO.

If any error in the submitted LUCAS data is detected by LuxSpace, data are sent back once to the RO/CO for correction. LuxSpace accepts only one resubmission of data. After that correction round, the data sets are directly forwarded to Eurostat with a status indicating that the data contains errors.

2.4 ROLE OF EUROSTAT

Eurostat supervises the whole quality control process and intervenes if systematic errors are detected at any step.

Eurostat will visit the Field Work contractors to control the application of the proposed quality assurance measures.

Eurostat also makes random checks to the data received from Luxspace according to the criteria presented in detail in Chapter 3. .

3 CONTROL PROCEDURES

In the following more details are provided on control procedures to be applied.

Please note that this is not an exhaustive list and other additional checks can and will be carried out.

3.1 Data import/export

DMT shall be used as the only tool for data entry, import and export. Automatic control procedures embedded in the DMT are described in the DMT Manual.

3.2 Surveyor ID (Field A)

To be defined by Central offices. For each surveyor an individual ID should be assigned to enable tracing the surveyor and "his/her" data.

3.3 Point_ID (Field B)

Fixed through the sample design. Correctness checked automatically by means of the GPS geographical coordinates and the "Observation Distance" entered by the surveyor.

3.4 Date (Field 1)

| Role | Check |
|----------|--|
| DMT | Checks that the survey date is within the specified survey period |
| QC SU | Check correctness. |
| QC RO/CO | Cross check with photo shooting (creation date of photo file) if questionable. |
| QC LXS | Cross check with photo shooting (creation date of photo file) if questionable. |

3.5 Start time and End time (Field 2, 3)

| Role | Check |
|----------|--|
| QC SU | Check that the survey time is more than 25 min and less than 1 h 15 minutes. Give reasons for a shorter or longer time in the remarks (Field 15). |
| QC RO/CO | Duration of survey/point < 25 min: check remarks and field documents and have a close look to the data, particularly the transect.. |
| QC LXS | Duration of survey/point < 25 min: check remarks and field documents and have a close look to the data, particularly the transect. Add surveyor on the watch list in |

| | |
|--|-------------------|
| | case of problems. |
|--|-------------------|

3.6 Type of Observation (Field 4, 5), Latitude/Longitude (Fields 6, 7, 8, 9, 10), Distance (Field 12) and Direction (Field 13)

| Role | Check |
|----------|---|
| QC SU | <p>Check that lat/long is in six decimal degrees.</p> <p>Check together with distance to the point whether point ID, lat/ long, W/E are correct.</p> <p>If Type of Observation is 2, 3 or 4 add comment.</p> |
| QC RO/CO | <p>Check whether lat/long is given in six decimals.</p> <p>Checks whether observation position/location is reasonable in the given context: check with Distance to the point (Field 12), and Observation Direction (Field 13), as well as with the field documents and orthophotos.</p> <p>Check with GPS tracks/waypoints on orthophotos.</p> <p>Check with previous LUCAS survey data.</p> <p>Add any comment if necessary.</p> |
| QC LXS | <p>Check whether lat/long is given in six decimals.</p> <p>Checks whether observation position/location is reasonable in the given context, together with Distance to the point (Field 12), and Observation Direction (Field 13), as well as with the field documents and orthophotos.</p> <p>Check with GPS tracks/waypoints.</p> <p>Check with previous LUCAS survey data.</p> |

3.7 Elevation (Field 11)

| Role | Check |
|----------|--|
| DMT | Automatically checked with elevation derived from public datasets used during stratification in 2006 |
| QC SU | none |
| QC RO/CO | none |
| QC LXS | none |

3.8 Description of the way to the point (Field 14)

| Role | Check |
|----------|--|
| QC SU | Check that the comments are understandable. |
| QC RO/CO | <p>Check if free text can be transformed in standardised comments.</p> <p>Provide translations in English if the comments are important for the QC carried out</p> |

| | |
|--------|---|
| | by LXS and Eurostat. |
| QC LXS | Check whether comments are needed and useful. |

3.9 Remarks about special circumstances (Field 15)

| Role | Check |
|----------|---|
| QC SU | Check that the comments are understandable. |
| QC RO/CO | Check if free text can be transformed in standardised comments. Provide translations in English if the comments are important for the QC carried out by Eurostat (e.g. why the point was not observed etc.). |
| QC LXS | Check whether comments are needed, useful and understandable. |

3.10 Land Cover and Land use: LC1 (Field 16), LC2 (Field 17), LU1 (Field 26) and LU2 (Field 27) and Plant species (Field 22, 23)

| Role | Check |
|----------|---|
| QC SU | Check LU and LC combination for consistency. Check with LC/LU from the previous survey (if available) for consistency. Add a remark if necessary. |
| QC RO/CO | Check LC and LU with all photos and ground documents for accuracy. Check LU and LC combination for consistency. Check consistency with 2006/2007 data if available. Add a remark if necessary. |
| QC LXS | Check LC and LU with all photos and ground documents for accuracy. Check LU and LC combination for consistency. Check consistency with 2006/2007 data if available. Check with LC/LU from the previous survey for consistency. |

3.11 Area Size (Field 19)

| Role | Check |
|----------|---|
| QC SU | Check with the landscape photos. Add remark, if orthophoto differs from reality (e.g. outdated). |
| QC RO/CO | Check with the landscape photos, orthophoto and remarks. |
| QC LXS | Check with the landscape photos, orthophoto and remarks. |

3.12 Height of trees at maturity (Field 20)

| Role | Check |
|----------|------------------------|
| QC SU | Check with the photos. |
| QC RO/CO | Check with the photos. |
| QC LXS | Check with the photos. |

3.13 Width of Feature (Field 21)

| Role | Check |
|----------|---|
| QC SU | Check with the orthophoto. Add remark, if orthophoto differs from reality. |
| QC RO/CO | Check with ground document, photos and remarks. |
| QC LXS | Check with ground document, photos and remarks. |

3.14 Percentage of land coverage LC1/LC2 (Field 24, 25)

| Role | Check |
|----------|---|
| QC SU | Check with the landscape photos/crop photo. |
| QC RO/CO | Check with the landscape photos/crop photo. |
| QC LXS | Check with the landscape photos/crop photo. |

3.15 Land management (Field 28)

| Role | Check |
|--------|---|
| QC SU | Check with the crop photo and landscape photos. |
| QC RO | Check with crop photo and landscape photos |
| QC LXS | Check with crop photo and landscape photos |

3.16 Presence of water management (Field 29)

| Role | Check |
|--------|--|
| QC SU | Check that the photo has been taken. |
| QC RO | Check whether photo taken and water management is visible on the photo. Check if the code coincides with feature the on photo. |
| QC LXS | Check whether photo taken and if the photo is of good quality. Check if the code coincides with the feature on photo. |

3.17 Source, Type of irrigation and delivery System (Field 30-32)

| Role | Check |
|--------|--------------------------------------|
| QC SU | Check that the photo has been taken. |
| QC RO | Check with photos if possible |
| QC LXS | Check with photos if possible |

3.18 Transect (Field 38)

| Role | Check |
|----------|--|
| QC SU | Check with the transect photo. Crosscheck with orthophoto for completeness if necessary. Add a remark if orthophoto differs from reality. |
| QC RO/CO | Check with orthophoto, ground document, landscape photos and GPS track for fundamental mistakes and incompleteness. Check if the first element coincides with rules (if transect starts with linear feature, look if N rule applied etc). Check whether visible structural elements in E direction appear in photos and transect. Check that the possible photo interpretation has been marked. |
| QC LXS | Check with orthophoto, ground document, landscape photos and GPS track for fundamental mistakes. Check if the first element coincides with rules (if transect starts with linear feature, look if N rule applied etc). Check whether visible structural elements in E direction appear in photos and transect. Check that the possible photo interpretation has been marked. |

3.19 Remarks to the transect (Field 39)

| Role | Check |
|----------|---|
| QC SU | Check that comments are understandable. If free text is used check whether they can be converted into standardized remarks |
| QC RO/CO | Check that comments are understandable. If free text is used check whether they can be converted into standardized remarks Translate into English if of relevance for QC. |
| QC LXS | Check if potential problems have been written down. |

3.20 Point, Crop, Landscape, Irrigation, Transect and Soil Photos (Field 40 - 48)

| Role | Check |
|----------|--|
| QC SU | <p>Check that all required photos are taken and of good quality. Rename the photos and take care that the photos are correctly assigned.</p> <p>Check whether photos need to be to be anonymised</p> <p>Check the physical size of the photo and compress if necessary.</p> |
| QC RO/CO | <p>Check completeness of photos, whether Taken/Not taken coincides with photos available.</p> <p>Check that the quality of the photos is good.</p> <p>Check whether photos have been correctly assigned to each category.</p> <p>Check whether not relevant fields are correctly ticked or whether photo should have been taken.</p> <p>Check whether photos are in correct format.</p> <p>Check the physical size of the photo and compress if necessary.</p> <p>Check whether photos have been multiplied/copied. It is not allowed to manipulate the photos.</p> <p>Check whether photos that need to be anonymised have been indicated.</p> |
| QC LXS | <p>Check completeness of photos, whether Taken/Not taken coincides with photos available.</p> <p>Check that the quality of the photos is good (focused, light conditions ok etc.).</p> <p>Check whether photos have been correctly assigned to each category (e.g. irrigation photo not taken as W landscape photo).</p> <p>Check whether not relevant fields are correctly ticked or whether photo should have been taken.</p> <p>Check whether photos are in correct format.</p> <p>Check whether photos have been multiplied/copied. It is not allowed to manipulate the photos.</p> <p>Check whether photos that need to be made anonymous, have been indicated.</p> |