ANNEX II: TERMS OF REFERENCE

LIST OF ABBREVIATIONS

AOI	Area of Interest
AP	Accession Partnership
ATS	Abstract Test Suite
CAP	Common Agricultural Policy of the European Union
CFCU	Central Finance and Contracts Unit
DEM	Digital Elevation Model
EQC	External Quality Control
ETS	Executive Test Suite
EU	European Union
EUD	Delegation of the European Union to Turkey
FTP	File Protocol Transfer
GDAR	General Directorate of Agricultural Reform
GDP	Gross Domestic Product
GIS	Geographical Information System
GISD	Geographical Information Systems Department
HW	Hardware
IACS	Integrated Administration and Control System
LPIS	Land Parcel Identification System
MIPD	Multi-annual Indicative Planning Document
MoFAL	Ministry of Food Agriculture and Livestock
MMM	Monthly Monitoring Meeting
PCU	Project Co-ordination Unit
PSC	Project Steering Committee
QC	Quality Control
R, G, B, NIR	Red, Green, Blue, Near Infrared
RS	Remote Sensing
SPO	Senior Programme Officer
SPS	Single Payment Scheme
STATIP	Determination of Problematic Land and Rehabilitation Project
SW	Software
TAT	Technical Assistance Team (of Contractor)

1. BACKGROUND INFORMATION

1.1. Beneficiary country

Republic of Turkey

1.2. Contracting Authority

Central Finance and Contracts Unit (CFCU)

1.3. Country background

The Republic of Turkey is geostrategically the bridge between East and West. Total land surface is about 78 million hectares. More specifically Turkey's area, inclusive of lakes, occupies 779 452 km^2, of which 755 688 km^2 are in Southwest Asia and 23 764 square km^2 in Europe, making Turkey a transcontinental country. Turkey's area makes it the world's 37th-largest country. The territory of the country is more than 1 600 km long and 800 km wide, with a roughly rectangular shape. Turkey is encircled by seas on three sides: the Aegean Sea to the west, the Black Sea to the north and the Mediterranean Sea to the south. Turkey is bordering the Black Sea, between Bulgaria and Georgia, and also bordering the Aegean Sea and the Mediterranean Sea, between Greece and Syria. Turkey also contains the Sea of Marmara in the northwest.

The European section of Turkey, in the northwest, is Eastern Thrace, forms the borders of Turkey with Greece and Bulgaria. The Asian part of the country, Anatolia, consists of a high central plateau with narrow coastal plains, between the Köroğlu and East-Black Sea mountain range to the north and the Taurus Mountains to the south. The uneven north Anatolian terrain running along the Black Sea resembles a long, narrow belt. This region comprises approximately one-sixth of Turkey's total land area. Eastern Turkey has a more mountainous landscape and is home to the sources of rivers such as the Euphrates, Tigris and Aras, and contains Lake Van and Mount Ararat i.e Turkey's highest point (5,165 m).

Turkey is geographically divided into seven census regions: Marmara, Aegean, Black Sea, Central Anatolia, Eastern Anatolia, South-eastern Anatolia and the Mediterranean. According to Address Based Population Registration System in 2009, Turkey's population counted 72.5 million persons where 17.7 million of them are living in villages. This implies that EU accession will have economic and social impacts on the Turkish Agriculture. Besides supplying raw material to industry, it is also important as a market for industry. Agriculture is one of the most important sectors in the Turkish economy both in terms of its share in total GDP (10.1% in 2010) and employment about 24,7% of the whole labour force in 2010.

A large fraction of the rural population in Turkey is employed on subsistence and semi-subsistence farms. Subsistence and semi-subsistence farming is an important characteristic of Turkish agriculture. The pattern of land ownership is highly skewed and varies regionally due to differences in incomes and the crops grown. According to the 2001 Agricultural Census-Agricultural Holdings Survey, there are just over 3 million agricultural holdings with average size of 6 hectares. 83 % of the total number of holdings has land smaller than 10 hectares. The average holding size is approximately 6 hectares. 59,5 % of the agricultural holdings in Turkey has 3 or more patches of land (parcels). Many of these holdings are, however, very small – about 33% are less than 2 hectares but represent only 5.3% of the total field crops area of 18.4 million hectares. 20.7 million hectares part of Turkey's surface area (26%) is forest area. 99 percent of forest areas administered by the Government. However, individuals, other institutions and legal entities are encouraged to grow and own forests. Within or around forestry areas, 7.6 Million people live in 20.550 forest villages.

In the arable crops sector, Turkey is a major producer. In 2009 the production of cereals in Turkey was 33.6 million tones, which represents 11.4% of the EU-27. Turkey is one of the world's biggest wheat and barley producers. Country is also a major producer and net exporter of fruit and vegetables. Its level of production is around 60% of EU-27 production of fruit and vegetables. As regards nuts, in particular for hazelnuts Turkey is the largest world exporter. Besides cotton and tobacco, sugar beet is another important industrial crop.

In addition to the importance of agriculture; stability of existing agricultural land, and furthermore the continuous decrease in total area due to use of land for non-agricultural purposes or misuse, increased the importance of existing agricultural land registry (detailed inventory).

Integrated Administration and Control System (IACS) as a system, covers mechanisms composed for the right administration and control of agricultural supports; while securing correct payments to farmers and preventing false declarations, enable real farmers, particularly the farmers who cultivate their lands, to be supported regarding their lands.

Land Parcel Identification System (LPIS), as one of the components of IACS, has been used for the identification of agricultural land in EU. LPIS is a tool especially for the administration and control of area-based subsidies (direct payments, production in less favoured areas, agri-environmental measures, participation of farmers to specific programs like organic farming, decreasing nitro pollution, reforestation etc.). Country-wide execution of cross checking will be reached through the help of fully functioning LPIS. In this regards LPIS shall be used for all submitted applications.

In general all the measures taken on the agricultural sector (direct payments, environmental and rural developing actions) are managed through IACS. As the most of the measures are related directly or indirectly with land, LPIS is a crucial component of the process.

1.4. Current situation in the sector

With its economic, social, political and technical aspects, agricultural sector has indispensable importance with different characteristics than the other sectors. The Republic of Turkey is energetically determined to fulfil the acquis communautaire especially in the political field of agriculture and rural development.

Turkey carried out a restructuring of the Ministry of Agriculture and Rural Affairs (MARA). A decree concerning the organisation and duties of the Ministry of Food Agriculture and Livestock (MoFAL) entered into force in June 2011 where it has found as an important step in developing the administrative structures necessary to implement Common Agricultural Policy (CAP) as stated in Turkey 2011 Progress Report.

Accession Partnership (AP) is a European Council Decision that establishes the main priorities (short and medium term) Turkey should focus on in the context of its pre-accession strategy. This is of key importance as AP serves as a basis for future political reforms. In this regards, medium term priority defined in AP for Chapter 11: Agriculture and Rural Development, read as: *continue developing the system of land identification* and the NFRS to prepare for controls on agricultural land. In this context, Turkey prepared a Strategy Paper on how it intends to further develop the system of land identification and the National Farmer Registration System (NFRS) to prepare for controls on agriculture land. Additionally, Multi-annual Indicative Planning Document (MIPD) identifies (Section II) agriculture as one of the priority areas for support.

The recent CAP (Common Agriculture Policy) reform (Council Regulation No 73/2009) generalized the Single Payment Scheme but maintains the key role of the IACS – GIS (Geographic Information System) and provides a general frame for the integration of specific coupled support schemes: Durum Wheat, Rice, Protein Crops, Energy Crops, Dairy Premium, Starch Potatoes, but also Dry Nuts (Nuts, Almonds, Hazelnuts, Pistachio, Locust Bean) which are very important in Turkey. With regard to institutional building, in order to adopt the Direct Support System and

others into new systems similar to those of the EU, it is planned to establish an efficient and up to date LPIS, as a basis for farmers declarations, used not only for the administrative cross checks but also for the spot controls of area based applications. In this context, LPIS represents crucial horizontal information that appropriate and important choices have to be anticipated.

All Member States are obliged to have their LPIS established with regard to a number of basic requirements defined by the European legislation and by related technical documents. Therefore Digitization of Land Parcel Identification System Project attempts to create LPIS through digitization and establishing the relevant database. In the first instance, ortho images covering whole Turkey shall be used as the main input for acquiring parcel-related geographic information. In practice, orthophotos shall be based on aerial photographs or satellite images of a territory, which are subsequently, processed using advanced computer technology. The resulting maps shall be used as a precise background for agricultural land mapping. Creating digital geographical database of reference parcels shall include creation of unique, homogenous, reliable and accurate LPIS database as reference system for administration of aid applications.

1.5. Related programmes and other donor activities

The External Quality Control Component of the Project is directly in relation with the Digitization of LPIS Component, together with the Orthophoto Production Component which will be providing the base maps to Digitization of LPIS Component. Within the External Quality Control Component, the outputs of the two contracts of Digitization and one contract of Orthophoto production will be evaluated and their quality control process will be performed to verify whether the deliverd products within these 3 contracts fulfil the requirements defined.

1.5.1. Technical Assistance for the MARA for the design of a functioning IACS and LPIS in Turkey

The aforementioned EU funded Project (TR. 0402.08/002 - Europeaid/121151/D/SV/TR) was implemented in order to define the institutional, legislative and investment requirements for the establishment and implementation of a phased functioning IACS in line with Council Regulation No.73/2009 and its integration with LPIS.

The project made an overall assessment, introduced the method and methodology and determined the investment requirements, aimed to increase the capacity of the MOFAL on legislative and institutional issues in line with EU legislation and practices. The project completed in September 2007. Further legislative and administrative actions concerning the identification of agricultural lands are recommended and assistance for the preparation of future project proposals for nationwide implementation of LPIS and IACS are provided. In this context, a preliminary methodology for LPIS digitization suited for Turkish conditions was also elaborated.

Project on Digitization of LPIS in Turkey, will seek to build on the methodology developed in the above mentioned project implemented in 2007 (TR0402.08/002) for the development of LPIS throughout the country. Outcome of previous project revealed that use of physical blocks has been selected as reference parcel for primary digitization and for creation of the geodatabase of eligible land which suits with Turkey's conditions. Physical block shall be used as reference parcel at the initial step of future planned LPIS work. After completion of physical block digitization and during the first year of an operating IACS implementation, procedure for the annual aid application process will be supported with the consultation procedure in order to make the farmers familiar with the new reference system. For farmers, the data contained in LPIS will represent reference information, which they use when filling the aid applications. Agricultural parcel locations shall be related to the physical blocks during this stage (after 2013). MoFAL personnel will assist the farmers to identify and locate the current declared agricultural area using the new reference system.

1.5.2. Determination of Problematic Land and Rehabilitation Project (STATIP)

Financed from the national budget, aims at preventing land deterioration as a result of misuse, through determining and solving the problems caused by patterns of use, and providing land use information for all stakeholders.

Under the project, the village borders taken into account for the first time; agricultural land and its qualification are determined on the basis of villages, districts, provinces and system will be served to the users/country and nationwide agricultural land inventory will have been prepared. Thus, the first step of down top planning is planned to be made as the basis for sustainable and viable development possible with the provision of continually updated and healthy information under macro planning arising from the local planning.

2. OBJECTIVE, PURPOSE & EXPECTED RESULTS

2.1. Overall objective

The overall objective of the project of which the contract will be a part is as follows;

To contribute to the objective of Turkey for having an area based agricultural support system in line with EU best practices and EU acquis through the full establishment of Integrated Administration and Control System (IACS) and establishment and implementation of Land Parcel Identification System (LPIS) in the whole country where through such system, all available agricultural land in the country will be recorded, un/misclaimed areas will be identified, the payments will be directly addressed to the farmers together with creating a base for the management of environmental and rural developing actions.

2.2. Purpose

The purposes of this project is to provide External Quality Control (EQC) services to assure the same level of geographical data quality and consistency, support the Beneficiary with monitoring and evaluating of the delivered products of orthophoto creation and LPIS digitisation contracts covering the whole country which will be used for further implementation of IACS and as background data for other related measures (protection, environmental assessment, rural developing measures, planning etc.)

2.3. Results to be achieved by the Contractor

- WEB based application for monitoring and evaluating the orthoimages and LPIS digitization is developed
- Final version of photointerpretation guideline is prepared
- Detailed analysis/control/documentation regarding the quality and accuracy of the deliverables and elaborated materials used/submitted by the orthophoto (1st component) and digitization contractors (3rd component) and the consolidated outputs of the whole project are delivered. In this regards;
  - EQC of delivered products of ortho contract is executed and QC reports are prepared
  - Orthos and DEM provided by Orthophoto contractor is checked and approved before delivery to LPIS digitization contractors
  - Inspections at the working locations of all LPIS digitization contractors are made in order to verify if the organisation of activities, training programs, workflow are respected

- EQC of products provided by LPIS digitization contractors is executed and QC reports are prepared
- Mean height and mean slope of all physical blocks are calculated

- Delivery of the information covering whole Turkey concerning the need for assuring the same level of geographical data quality and consistency satisfying the technical requirements at nationwide scale. (All data within the Project on Digitization of LPIS in Turkey will flow from EQC contractor in addition to the control and evaluation responsibilities)

3. ASSUMPTIONS & RISKS

3.1. Assumptions underlying the project

–MoFAL will be responsible for organization and call for steering committee meetings and regular monitoring meetings with ortho creation and digitization contractors, EQC Contractor and other relevant institutions

–MoFAL will set up the access rights and user groups of web based application

–MoFAL will provide topologically consistent administrative boundary on district and province level and the grid of the delivered orthophoto tiles to be used as input data for web based application

–MoFAL will provide support, consultation and supervising the EQC provider

3.2. Risks

Respecting the general IACS/LPIS implementation process in Turkey is a critical factor and the success of the physical block digitization depends on MoFAL's efficient monitoring and coordination of all the inputs and outputs of the various lots.
The three components of the overall project are interdependent and so good cooperation will be Important to ensure effective and smooth implementation

4. SCOPE OF THE WORK

4.1. General

4.1.1. Project description

External Quality Control (EQC) of the products delivered by orthophoto and LPIS digitization contractors for the whole country, developing an integrated WEB/GIS application as a monitoring tool within the implementation framework of IACS in Turkey.

The quality control will be realized throughout clearly specified tasks that scrutinises all or a sample of the items created during or even at the end of the orthophotos production and LPIS digitization process, in order to ensure that the final product is of satisfactory quality. The scrutiny involves review, inspection or quantitative measurement, against well-defined pass/fail criteria which are set out in the relevant specifications.

The EQC will be a qualitative quality control that will cover the activities of orthophoto production and LPIS digitization as a whole. The information used in the EQC will mainly be provided by quality control records (QCRs) which are generated during the work. QCRs will take a variety of formats, such as paper forms completed manually, printouts or computer files recording the result of a particular procedure available also through a WEB/GIS application.

Assignment includes the implementation of the following tasks:

- Develop a simple WEB/GIS application that will serve for monitoring progress, evaluating and coordinating outputs from orthophoto creation contract with data inputs and outputs of LPIS digitization contracts. This GIS instrument must be accessible via internet, in order to be able to exchange information regularly and in real time between MoFAL, orthophoto, LPIS digitization contractors and other involved institutions if required.
- Support MoFAL in coordinating the orthophoto contract and provide EQC on delivered products. Quality Control will cover the full production cycle including acquisition of images through Aerial flights or Satellites, external orientation of images, geodetic field measurements, DEM production, Orthorectification, mosaicking and tile's production. The geometrical accuracy of the final products also will be checked.
- Support MoFAL in coordinating the physical block digitization contractors and preparing the final photointerpretation guideline to be used during the digitization process. Within the digitization process, all the agricultural parcels in Turkey, of around 780,000 km2, in physical block format will be produced where, the photointerpretation guideline will be defining the terms for such digitization. Consequently the photointerpretation guideline will be prepared in line with EU acquis together with taking the previous applications as reference.
- Executing EQC on the results that are to be delivered by LPIS digitization contractors. Quality Control will cover the correct applied of photointerpretation rules, the geometric correctness and accuracy as well the topological consistency.

4.1.2. Geographical area to be covered

Whole country will be taken into account in order to generate a seamless, updated and homogeneous dataset at nationwide scale through combination of ortho images attained from multiple sources (Aerial and Satellite), collateral products used for accuracy improvement and the produced LPIS layers.

4.1.3. Target groups

The primary target group will be Ministry of Food, Agriculture and Livestock (MoFAL) at central and provincial levels.

4.2. Specific work

The Contractor should elaborate in detail how they would address the required activities in their proposed organisation and methodology. He should give illustrative explanation/examples he would use and approach they intend to adopt for each of the activities below as well as any other activity they consider necessary for a successful implementation of the project. The Contractor is free to offer additional activities as necessary in their proposal bearing in mind that the mentioned activities under this Terms of Reference are the minimum requirements that the Contractor should meet. All activities are to be carried out in close cooperation with Beneficiary and the Contracting Authority.

The following activities will be held within the scope of this project while the detailed technical requirements for the below activities are described in the subsequent sub-sections;

- Developing the WEB/GIS instrument
- Technical and methodological coordination support
- Executing the external quality control

All different phases of EQC on ortho production and LPIS digitization have to be carried out in accordance with the best practice approaches defined in JRC document *Guidelines for Best Practice and Quality Checking of Ortho Imagery, v 3.0* (Appendix 1) and *LPIS QA Technical Documentation v 5.2* (Appendix 2) respectively More specific, for the resulted LPIS polygons, an

Acceptance Quality Limit inception process will be applied in line with the ISO 2859-1 specifications.

The Contractor should present a detailed work plan for the Project (timing, duration and sequence of the activities) in their proposed organisation and methodology, together with the estimated number of working days per activity. Milestone calendar, including a reporting plan should also be included. All activities should be addressed by means of measurable units, in order to evaluate how the tenderers envisage the timing and allocation of activities based on expert mandays. In this regards, a broad overview of the project activities broken down by task is required to be included, with attention to planning and management of inputs and outputs.

The copyright of all the outputs produced within the context of this contract will be the property of the Contracting Authority and of the Beneficiary. The Contractor shall not use any of the outputs produced via this contract for commercial, private and/or any other purposes.

4.2.1. Developing the WEB/GIS instrument

The instrument to be developed is required to serve a simple WEB-GIS system where vector and raster layers such as the map tiles of the delivered orthophotos, administrative borders, orthophotos, DEM, etc. can be visualized and simply analysed on a user friendly platform.

The contractor will define the exact structure of the alphanumerical database depending on the inputs made available by MoFAL. The database will be updated regularly to allow monitoring the progress of the related contracts.

WEB-GIS application will have to be designed and created so that the access of various involved users is provided and information is supplied from/to the other interested parties. This application shall cover at least:

- An analysis of the functions requested by MoFAL and the involved regional structures as regards contractors work schedule, monitoring work progress and evaluating the delivered results.
- The application will allow to visualize at least the following data in a GIS environment by authorized personnel of MoFAL, orthophoto and digitization contractors and other involved authorities:

  - Territory coverage status by;
    - acquired/proper new or archive images
    - created orthophotos and DEMs
    - orthophotos and DEMs delivered to EQC
    - accepted/rejected orthophotos and DEMs
    - digitized units
    - digitized districts delivered to EQC –Accepted/rejected digitized districts

The WEB-GIS application will have to provide an efficient interface for the project related parties and must provide a number of functions:

- Automatic generation of reports or thematic outputs for the project related parties including notification regarding the delivery or availability of orthophotos and DEMs plans, execution of digitization, quality control reports, etc.
- Manage specific information access levels for various users
- Monitor the program abatements, delays and other elements that could endanger finishing the whole project components on time

The contractor will provide a file protocol transfer (FTP) service for data exchange to assure communication of geodatabase files between the digitization contractors, MoFAL and the contractor. Procedure regarding FTP data exchanges with the digitization contractors will be proposed and the FTP server will be kept as permanent service until the contract is terminated to avoid time losses of data flow.

Contractor will provide its own infrastructure (servers, connections, etc) during the whole duration of the contract for supporting the operation of WEB-GIS application and FTP services where in case required the Contractor will be responsible for providing any licences concerning the GIS engine for the application. Contractor will be responsible for training MoFAL personnel, orthophoto and LPIS digitization contractors on using the application. System will be installed to the computer(s) of admin(s) assigned by MoFAL and EQC Contractor.

4.2.2. Technical and methodological coordination support

During the time overlapping of the current project with the projects of orthophoto production (24 months) and LPIS digitization (17 months), the Contractor will be responsible for the following tasks:

4.2.2.1. Input/Output management

- Take over the delivered data from orthophoto production contractor (TR2010/0311.01 - 01/001)
- Verify whether the media contain the correct data and if they are readable
- Execute geometry control to evaluate the horizontal precision of delivered orthoimages and the height precision of delivered DEMs . The controls will cover a percentage of 5% - 10% of the total delivered orthoimages and DEM. They will be realized with the use of independent control points with higher precision than the ones which are required for the production of orthoimages either using existing control points or determining news via measurements in the field. The coordinates that will result from the measurements of independent control points will be compared with those that result from the orthoimages and DEMs with a view to calculate the relative statistical figures which determine the level of precision of final products.
- Execute radiometry controls to evaluate the photo interpretation quality of delivered orthoimages, and assure that the biggest possible degree of optical information is available. The controls will be realized using the statistical elements of histogram for each tile, as well as the optical evaluation of their distinctness and quality.
- Update the GIS database with the ortho coverage plan, current status and provide reports to MoFAL
- Assure the systematic archiving of the data and make them accessible to MoFAL
- Prepare collection of orthophotos for digitization contractors, assure the data distribution and exchange (Hard Disks or FTP)
- Ensure that MoFAL is in possession of all delivered Orthos and DEMs
- Take over the delivered data from digitization contractors
- Verify whether the media contain the correct data and if they are readable.
- Control methodology applied on LPIS digitization.

4.2.2.2. Methodological support and supervising

- Contractor will participate in the Initial Briefing, in which the digitization contractors presents the draft photointerpretation guidelines

- Contractor will provide services related to creation of final version of photointerpretation guideline in close cooperation with MoFAL
- If necessary, the contractor will finalize the detailed specifications regarding the GIS databases structure and architecture
- Make inspections at the working locations of all digitization contractors to verify activity organization, the training program of operator's staff, customization of digitization SW and internal quality control system implementation. The Contractor will draft an evaluation report with the conclusions of these inspections and make recommendations

4.2.2.3. Technical support and maintenance

The Contractor will assist or provide support to the MoFAL throughout the entire duration of the contract by means of personnel that will execute all the activities responsible with the technical coordination and support, WEB-GIS application maintenance, managing, updating and periodical back-up the database. MoFAL shall arrange work locations equipped with internet access at centre available to the contractor. Relevant experts of the contractor will also participate to the initial briefing, and also to the monthly progress meetings. In case some additional problematic cases with photointerpretation will occur, Contractor shall provide expertise.

Regarding the WEB-GIS application database maintenance and updating, the Contractor will be responsible to provide up-to-date data to MOFAL regarding;

- Territory coverage status by;
  - acquired/proper new or archive images
  - created orthophotos and DEMs
  - orthophotos delivered to EQC
  - accepted/rejected orthophotos and DEMs
  - digitized units
  - digitized districts delivered to EQC accepted/rejected digitized districts
- Other relevant data sets on MoFAL request

4.2.3. Executing the external quality control

4.2.3.1. EQC of delivered orthophotos

The services of EQC shall start 12 months after the Orthophoto creation contract is started. EQC of delivered Orthophotos and DEMs should ensure the high quality level in the produced data. In the first stage of quality control, the contractor shall provide following controls of Orthophotos and DEMs delivered to beneficiary:

- Controls of the geometric precision of orthoimages and DEMs (see SUPPLEMENT I)
- Controls of the radiometry of orthoimages (see SUPPLEMENT II)

4.2.3.2. Implementation supervising

Although the main activity of the Contractor will be the inspection of batches of production output and providing related feedbacks, in the framework of definitions of the requirements especially on working locations concerning the Digitization and the orthopohoto production projects; contractor will also make random inspections at the working locations of all digitization contractors to verify the SW implementation/customization and to check the training of digitization personnel on photointerpretation together with the working locations of the Orthophoto contractor to verify whether they obey the working location requirements defined.

Furthermore the contractor shall verify if workflow organization and internal quality control systems are implemented not limited with the commitments submitted within the relevant technical

proposal but also in line with the inception report which need to be brought into a common line between digitization contractors. The Contractor will draft evaluation reports with the conclusions of these inspections and will make recommendations.

4.2.3.3. EQC of digitization results

After implementation supervising phase, the contractor will be responsible to execute EQC of digitization results. External quality control will be conducted in two stages:

- data integrity and homogeneity control
- data quality control

Data integrity and homogeneity control consists from following steps:

- Check of the structure, integrity and existence/completeness of directories and files on the data store media received from the digitization contractors
- Data delivery shall respect the administrative unit (district) as basic unit
- Checks of all polygons supplied by the digitization contractors, in order to verify that all technical specifications of requested fields are filled-in and are in compliance with data type and length. Contractor may elaborate automating database verification procedures.
- Applying an Abstract Test Suite (ATS) to test data model conformance and an Executive Test Suite (ETS), if relevant data are available, to verify actual data value conformance. The proposed methodology was imbedded in Regulation 2010R146, amending the CAP regulation 2009R1122

Contractor shall draft report. All polygons having database homogeneity errors or inconsistency shall be listed in the report and the entire administrative territory shall be proposed for rejection and delivered in corrected form back to the EQC contractor.

Data quality control includes at least the following checks:

- Polygons must cover whole delivered area within administrative unit. No area to be left non digitized
- Majority of area have to be checked on borders polygons to proper adjacent to administrative units
- All polygons will be checked for geometrical and topological rules (see SUPPLEMENT III)
- Randomly selected representative sample of polygons will be check for digitization and photointerpretation rules (see SUPPLEMENT IV)
- Randomly selected representative sample of polygons will be checked for proper land cover category, land cover subcategory, max area and estimated number of agriculture parcels within them.
- No overlay/gap of polygons between different delivered districts and at the LOT's border (to be ensured by digitization contractors and controlled by EQC contractor)

Only agricultural eligible areas and selected landscape features will be subject to the detailed control of digitization and photointerpretation rules of randomly selected polygons. Consequently some changes may occur concerning eligibility due to revision of the regulation. Contractor shall propose the entire control procedure and methodology for statistically representative sample selection and condition for acceptance/rejection of the data delivered.

For each delivered unit to EQC (district), contractor shall provide quality control report, containing a list of polygons selected to verification and results from control.

If, within the EQC, the Contractor finds errors, not enough to cause rejection of the delivered unit, in line with ISO 2859-1 regulation, data will be returned to the digitization contractor via FTP with the quality control report containing the errors found. Latter necessitate the obligation of executing the required corrections and retransmitting the corrected data back to the contractor. The Contractor shall then execute a new quality control on the corrected data.

If, following external quality control, the Contractor finds errors enough to cause the rejection of the entire delivery unit, in line with ISO 2859-1 regulation data will be returned to the digitization contractor via FTP with the quality control report. Latter necessitate the obligation of correct the entire administrative territory and retransmitting the corrected data to the contractor. The Contractor shall then execute a new quality control having the same sized sample as if it is a new delivery.

Contractor shall provide the data quality control as soon as possible, not exceeding 30 working days following the data upload and written notification from the up loader. WEB-GIS application should be up-to date with all the delivery evaluation and results, within 5 working days at the latest.

All the quality control reports will also be given to the Beneficiary. Finally verified and accepted data will be delivered and implemented into MoFAL structure. Contractor shall also provide systematic back-up of delivered data]Project management

4.3. Project management

4.3.1. Responsible body

The Central Finance and Contracts Unit (CFCU) will be the Contracting Authority and will be responsible for all procedural aspects of the tendering process, contracting matters and financial management including payment of project activities.

Geographical Information System Department (GISD) under General Directorate of Agricultural Reform (GDAR) of the Ministry of Food, Agriculture and Livestock (MoFAL) is the Beneficiary of the Project. GDAR is responsible for the technical implementation of the project.

4.3.2. Management structure

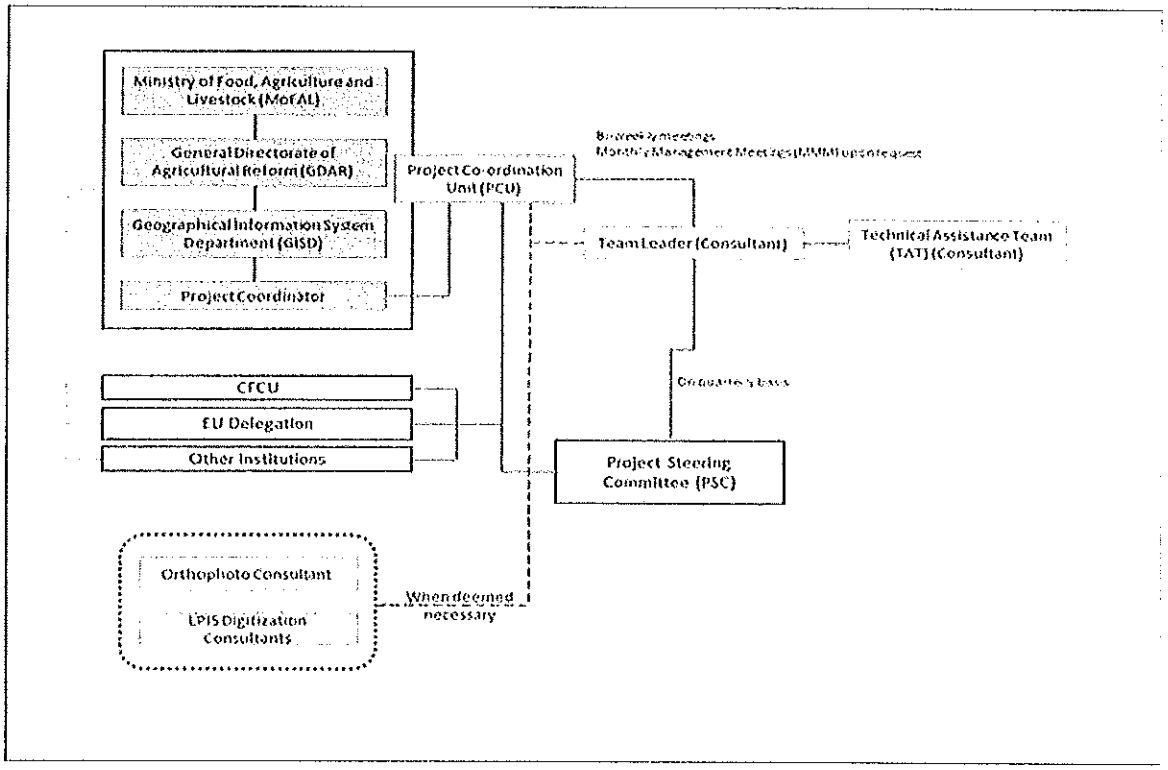
The Beneficiary will establish a Project Co-ordination Unit (PCU) which will operate in MoFAL premises. GDAR will appoint a Project Coordinator to assist and follow the project development. The PCU will be composed of the Project Coordinator and enough number of personnel. The purpose of the PCU will be to; ensure effective communication between the technical assistance team (TAT) and the Beneficiary, to coordinate the project activities on an ongoing basis, assure coordination between digitization, orthophoto and external quality control (EQC) contracts/contractors being the components of the same project fiche. Monthly management meetings (MMM) will be organised in the premises of Beneficiary. PCU, TAT, CFCU and EQC Component's Contractor will meet monthly to see the progress of the project. All the secretarial works of the MMM will be conducted by the TAT under the coordination of PCU. There will be continuous interaction between MoFAL (PCU) and Contractor (TAT) through project.

Monthly progress reports shall also be prepared and submitted to Beneficiary, prior to the monitoring/co-ordination meetings between TAT and PCU and shall describe the current status of digitized area, area after IQC, area after EQC and finally delivered data on district base and the estimation of planned work for next month.

For the purpose of this Technical Assistance Component, Steering Committees will be chaired by the MoFAL in a quarterly basis. Steering Committees will be consisting of representatives from MoFAL and the CFCU as member. Representative of EUD will also attend to the Steering

Committee meetings as observer. SPO, when necessary, may invite other relevant participants in the Steering Committee meetings. Steering Committee will meet to discuss the progress of the project, verify the achievement of the outputs and mandatory results and discuss actions to be undertaken at quarterly intervals or whenever deemed necessary by its members. The responsibility for the organization of the Steering Committee meetings including preparation of minutes lies with Technical Assistance Team.

Below is a simple flow diagram representing the Project Management Structure:



4.3.3. Facilities to be provided by the Contracting Authority and/or other parties

To fully implement the general assignment, the Beneficiary will provide the Contractor with appropriate support. The latter includes notably;

- The Beneficiary manages the coordination of data delivery with EQC contractor.
- Internal coordination with other components' contractors (LPIS and orthophoto) for timely data flow/collection and facilitation of the contacts that might be deemed necessary for the performance of specific tasks (pre-coordination with provincial directorates, local associates/farmers etc in advance, prior to field control/measurement) Show best endeavour for the provision of the set of documents/collateral data required for implementation of the assignment
- Provide an office to the key experts of the Contractor within MoFAL premises in Ankara. The logistical support within these offices will include access to internet, telephone, fax will be provided by the Beneficiary. However, Contractor will bear the expenses regarding the use of those equipments/cost of lines.

In order to complete the execution of EQC efficiently, Contractor will be responsible for:

- Overall project coordination,
- Design and develop WEB-GIS application for monitoring and evaluating
- Train the MoFAL staff in use of WEB-GIS application.
- Executing quality control of delivered orthophotos/DEMs and prepare quality control reports

- Providing the final version of photo interpretation guideline and database structure in cooperation with digitization contractors and MoFAL
- Provide inspection at the working locations of all digitization contractors
- Providing consultation services to MoFAL with regard to special photointerpretation cases
- Executing quality control of digitization results, prepare quality control reports
- Verify data delivery regularity
- Cooperation with Orthophoto and digitization contractors
- Data implementation in MoFAL infrastructure

5. LOGISTICS AND TIMING

5.1. Location

Base of operation will be in Ankara, Turkey.

5.2. Start date & period of implementation

The intended start date is September 2014 and the period of implementation of the contract will be 26 months from this date. Please see Articles 19.1 and 19.2 of the Special Conditions for the actual start date and period of implementation.

6. REQUIREMENTS

6.1. Staff

Note that civil servants and other staff of the public administration of the beneficiary country cannot be proposed as experts, unless prior written approval has been obtained from the European Commission.

6.1.1. Key experts

Key experts have a crucial role in implementing the contract.

These terms of reference contain the required key experts' profiles. The tenderer shall submit CVs and Statements of Exclusivity and Availability for the following key experts:

Key experts will be fully responsible for the project during whole implementation period (26 months) of the project. On the other hand, they must spend minimum 60% of total implementation period in Turkey with beneficiary. Correspondence between the proposed methodology and the expert inputs is required to be contained in the Organisation and Methodology of tenderers

Note that civil servants and other staff of the public administration of the beneficiary country cannot be recruited as experts, unless prior written approval has been obtained from the European Commission

Minimum working days of the experts are expected as below;

Key Expert 1: Team Leader	**480 wd**
Key Expert 2: LPIS expert	**440 wd**
Key Expert 3: Orthophoto expert	**440 wd**
Key Expert 4: Quality Control Expert	**440 wd**

CVs must be provided in the standard EU format. The profiles of the key experts for this contract are as follows:

Key Expert 1: Team Leader

Qualifications and skills

- University Bachelor's degree in information technology, agriculture, land management or other technical fields closely related to the field of the contract. In the absence of indicated type of degree, a minimum of 15 years of relevant professional experience is required.
- Computer literacy.
- Master and/or PhD degree on GIS, Photogrammetry or Remote Sensing will be an asset.
- Certification on project management will be an asset.

General professional experience

- Minimum 10 years of professional experience in the field of the contract.

Specific professional experience

- Minimum 2 years of experience as project manager or other managerial role in internationally funded projects on data production projects covering experience on GIS, Photogrammetry and RS application. More experience would be asset.
- Minimum 2 projects of experience as technical personnel related to LPIS, cartography, GIS, RS, Digital Orthophotos production or independent quality assurance in the fields related to the contract.. More experience would be asset.

Key Expert 2: LPIS expert

Qualifications and skills

- University Bachelor's degree in engineering, information technology or agriculture, land management or other technical fields closely related to the field of the contract. In the absence of indicated type of degree, a minimum of 15 years of relevant professional experience is required.
- Good command of written and spoken English.
- Computer literacy.
- Master and/or PhD degree on above fields will be an asset.

General professional experience

- Minimum 10 years of professional experience in data production.

Specific professional experience

- Minimum 2 years' experience as a expert or similar positions related to design, creation, control or updating the LPIS database or similar databases. More experience will be an asset.
- Minimum 1 project experience in the field of LPIS database or similar databases. More experience will be an asset.
- Minimum 2 years of experience in the practical application of IACS/LPIS in EU member states or candidate countries. More experience will be an asset.

Key Expert 3: Orthophoto expert

Qualifications and skills

- University Bachelor's degree in Geodesy/Survey engineering or a related discipline In the absence of indicated type of degree a minimum 15 years of relevant professional experience required.
- Good command of written and spoken English.
- Computer literacy.
- Master and/or PhD degree on Geodesy, Photogrammetry, Cartography, GIS or RS will be an asset.

General professional experience

- Minimum 10 years of professional experience in the field of the contract.
- Experience in developing and/or coordinating and/or conducting training programs. (The relevancy is about the requirement of creating photointerpretation guideline)
- Experience on Orthophotos acquisition in EU member state of candidate country would be an asset.

Specific professional experience

- Minimum 3 years of experience working with digital photogrammetry, remote sensing and GIS technologies, technical coordination of similar projects. More experience would be an asset.
- Minimum 1 project experience as a technical personnel covering the responsibility of the whole circle of orthophotos production projects (aerial photography, field measurements, aerial triangulations, DEM and Orthos production). More experience would be an asset.
- Minimum 1 project experience in the field of orthophotos production. More experience would be an asset.

Key Expert 4: Quality Control Expert

Qualifications and skills

- University Bachelor's degree in a relevant field to the contract. In the absence of the indicated type of degree, a minimum 15 years of relevant professional experience is required.
- Good command of written and spoken English.
- Computer literacy.
- Master and/or PhD degree on GIS, Photogrammetry, Remote Sensing or Quality controls will be an asset.

General professional experience

- Minimum 10 years of professional experience in the field of the contract.
- Experience in the field of contract in any member state of the EU or in one of the EU accession countries will be an asset.

Specific professional experience

- Minimum 5 years of experience related to data creation and quality control procedure on spatial data (vector, raster).
- As an asset experience in the field of creation/update of LPIS or Orthophotos.

All experts must be independent and free from conflicts of interest in the responsibilities they take on.

6.1.2. Non key experts

CVs for experts other than the key experts are not examined prior to the signature of the contract. They should not be included in tenders.

The Contractor must select and hire other experts as required according to the profiles identified in the Organisation & Methodology. They must clearly indicate their profile so that the applicable daily fee rate in the budget breakdown is clear. All experts must be independent and free from conflicts of interest in the responsibilities they take on.

The selection procedures used by the Contractor to select these other experts must be transparent, and must be based on pre-defined criteria, including professional qualifications, language skills and work experience. The findings of the selection panel must be recorded. The selected experts must be subject to approval by the Contracting Authority.

6.1.3. Support staff & backstopping

Backstopping and support staff costs must be included in the fee rates.

6.2. Office accommodation

Office accommodation of a reasonable standard and of approximately 10 square metres for each expert working on the contract is to be provided by the Beneficiary.

6.3. Facilities to be provided by the Contractor

The Contractor must ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support their work under the contract and to ensure that its employees are paid regularly and in a timely fashion.

In particular the Contractor shall provide;

- All required patented/licenced SW including licence fees, royalties etc until the end of the Contractor's contract.
- All relevant operations with regard to public information, visibility and dissemination of project and its outcomes.
- Communication, interpretation and translation facilities required for a suitable implementation of tasks.
- Production of training materials.

6.4. Equipment

No equipment is to be purchased on behalf of the Contracting Authority / beneficiary country as part of this service contract or transferred to the Contracting Authority / beneficiary country at the end of this contract. Any equipment related to this contract that is to be acquired by the beneficiary country must be purchased by means of a separate supply tender procedure.

6.5. Incidental expenditure

The provision for incidental expenditure covers ancillary and exceptional eligible expenditure incurred under this contract. It cannot be used for costs that should be covered by the Contractor as part of its fee rates, as defined above. Its use is governed by the provisions in the General Conditions and the notes in Annex V to the Contract. It covers:

1. Travel costs and subsistence allowances for missions, outside the normal place of posting, undertaken as part of this contract. If applicable, indicate whether the provision includes costs for environmental measures, for example $C0_2$ offsetting.

2. Regarding the field controls; travel (most economical alternative based on the distance), accommodation, intercity travel, meals/beverages, costs of publish/dissemination of the documents required on field, translation expenditures of the experts and meal/beverage expenses of assigned staff in case an accompany is required from MoFAL during the field missions. Actual costs paid for travel and accommodation could be covered under the project budget, if applicable. However, no pocket money shall be paid to civil servants in any case.

The Provision for incidental expenditure for this contract is **EUR 200.000,00.** This amount must be included unchanged in the Budget breakdown.

Daily subsistence costs may be reimbursed for missions foreseen in these terms of reference or approved by the Contracting Authority, and carried out by the contractor's authorised experts, entailing overnight stays outside the expert's normal place of posting. Any subsistence allowances to be paid for missions undertaken as part of this contract must not exceed the per diem rates published on the website:
http://ec.europa.eu/europeaid/work/procedures/index_en.htm
at the start of each such mission.

The per diem is a flat-rate sum covering daily subsistence costs. These include accommodation, meals, tips and local travel, including travel to and from the airport. Taxi fares are therefore covered by the per diem. Per diem are payable on the basis of the number of nights spent on site by the contractor's authorised experts for missions carried out outside the expert's normal place of posting.

Prior approval by the Contracting Authority for the use of the incidental expenditure is not needed with the exception of for the items numbered 2 above.

6.6. Lump sums

Activities described in **section 4.2.1. Developing the WEB/GIS instrument** will be paid under lump sums.

6.7. Expenditure verification

The provision for expenditure verification covers the fees of the auditor charged with verifying the expenditure of this contract in order to proceed with the payment of any pre-financing instalments and/or interim payments.

The provision for expenditure verification for this contract is **EUR 30.000,00.** This amount must be included unchanged in the Budget breakdown.

This provision cannot be decreased but can be increased during execution of the contract.

7. REPORTS

7.1. Reporting requirements

Please see Article 26 of the General Conditions. Interim reports must be prepared every six months during the period of implementation of the tasks. They must be provided along with the corresponding invoice, the financial report and an expenditure verification report defined in Article 28 of the General Conditions. There must be a final report, a final invoice and the financial report accompanied by an expenditure verification report at the end of the period of implementation of the tasks. The draft final report must be submitted at least one month before the end of the period of implementation of the tasks. Note that these interim and final reports are additional to any required in Section 4.2 of these Terms of Reference.

Each report must consist of a narrative section and a financial section. The financial section must contain details of the time inputs of the experts, incidental expenditure and expenditure verification.

Name of report	Content	Time of submission
Inception Report	Analysis of existing situation and work plan for the project	No later than 1 month after the start of implementation
6-month Progress Report	Short description of progress (technical and financial) including problems encountered; planned work for the next 6 months accompanied by an invoice and the expenditure verification report.	No later than 1 month after the end of each 6-month implementation period.
Draft Final Report	Short description of achievements including problems encountered and recommendations.	No later than 1 month before the end of the implementation period.
Final Report	Short description of achievements including problems encountered and recommendations; a final invoice and the financial report accompanied by the expenditure verification report.	Within 1 month of receiving comments on the draft final report from the Project Manager identified in the contract.

7.2. Submission & approval of reports

3 copies of the reports referred to above must be submitted to the Project Manager identified in the contract. The reports must be written in English. The Project Manager is responsible for approving the reports.

All reports must be clear and concise, thus enabling decision-taking on this basis by the executive bodies concerned. All reports should also be prepared in Turkish for Beneficiary and submitted by both in hard copy and in electronic version (pdf and word formats).

Electronic submission of the reports will only be made through DVDs or equivalent medias and should conform to the templates/visual format specified in the latest version of *EU Visibility Guidelines*. Further information is provided in Section 9.

8. MONITORING AND EVALUATION

8.1. Definition of indicators

The project will be monitored through all reports, , all monitoring meetings, steering committee meetings and achieved results against the work programme by consideration of the following indicators;

- Fully working and operating WEB/GIS application is developed in order to monitor and evaluate the progresses and quality of image (orthophoto) delivery and LPIS reference parcel (RP) identification (vector and database).
- Set up the standards and procedure to execute quality control of orthos & DEMs and LPIS data
- Final version of photo interpretation guideline is submitted and approved by MoFAL. Draft version will be completed before the beginning of LPIS digitization process where the feedback from digitization contractors concerning the experience/observations on local landscape features will be integrated at later stages.
- Coordination and consultation services for MoFAL related to photo interpretation guideline, database structure, architecture and data delivery is provided in cooperation with digitization contractors and MoFAL
- Data flow between contractors of all other components are executed.

8.2. Special requirements

N/A

9. PUBLICITY AND VISIBILITY

The Contractor shall take all necessary measures to publicize the fact that the European Union has financed the Program.

In addition, the Contractor shall take the necessary measures to ensure the visibility of the European Union financing or co financing. These measures must comply with the rules laid down and published by the Commission on the visibility of external operations:

http://ec.europa.eu/europeaid/work/visibility/index_en.htm

All projects /contract implemented under this programme shall comply with the Visibility Guidelines for European Commission Projects in Turkey published by the EU Delegation to Turkey, at http://www.avrupa.info.tr/AB_Mali_Destegi/Gorunurluk,Visi.html

All communication and visibility activities should be carried out in close co-operation with the CFCU. The CFCU is the main authority in charge of reviewing and approving visibility-related materials and activities. Before initiating any information, communication or visibility material and activity, Contractors and implementing partners should seek the approval of the CFCU in writing.

The EU-Turkey cooperation logo should be accompanied by the following text:

"This project is financed by the European Union and the Republic of Turkey."

Whether used in the form of the EU-Turkey cooperation logo for information materials or separately at events, the EU and Turkish flag have to enjoy at least double prominence each, both in terms of size and placement in relation to other displayed logos and should appear on all materials and at all events as per the Communication and Visibility Manual for European Union External Actions. At visibility events, the Turkish and the EU flag have to be displayed prominently and separately from any logos.

Logos of the beneficiary institution and the CFCU should be clearly separated from the EU-Turkey partnership logo and be maximum half the size of each flag. The logos will not be accompanied by any text. The CFCU and beneficiary logo will be on the lower left-hand corner and lower right-hand corner respectively. The Contractor logo with the same size will be in the middle of the CFCU and beneficiary logo. If the Contractor is a consortium, only the logo of the consortium leader will be displayed.

Any publication by the Contractor, in whatever form and by whatever medium, including the Internet, shall carry the following or a similar warning: "This document has been produced with the financial assistance of the European Union". In addition, the back cover of any such publications by the Contractor should also contain the following disclaimer: "The contents of this publication is the sole responsibility of name of the author/Contractor/implementing partner – and can in no way be taken to reflect the views of the European Union".

APPENDICES:

TECHNICAL SUPPLEMENT I	:	CONTROLS OF THE GEOMETRIC PRECISION OF DELIVERABLE ORTHOIMAGES AND DEMS
TECHNICAL SUPPLEMENT II	:	CONTROLS OF RADIOMETRY OF DELIVERABLE ORTHOIMAGES
TECHNICAL SUPPLEMENT III	:	GEOMETRICAL AND TOPOLOGICAL RULES
TECHNICAL SUPPLEMENT IV	:	DIGITIZATION AND PHOTOINTERPRETATION RULES
APPENDIX 1	:	GUIDELINES FOR BEST PRACTICE AND QUALITY CHECKING OF ORTHO IMAGERY, V 3.0
APPENDIX 2	:	LPIS QA TECHNICAL DOCUMENTATION V 5.2

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