FAO/TURKEY PARTNERSHIP PROGRAMME

UTF/TUR/060/TUR

Pilot evaluation:

Land Consolidation in Konya Region, Cumra District, villages Inli and Dinlendik (2010-2012)

Morten Kvistgaard with input from Morten Hartvigsen
16 October 2015

Final Report

Disclaimer

This report is prepared by international consultant, Mr. Morten Kvistgaard with input from Morten Hartvigsen, FAO REU land tenure officer, and the viewpoints, conclusions and recommendations expressed in this report do not necessary reflect the positions of Ministry of Food, Agriculture and Livestock of Turkey or FAO.

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List of abbreviations

EC	European Commission
EIA	Environmental Impact Assessment
EU	European Union
CAP	Common Agricultural Policy
Da	Decare (0.1 hectare = 1,000 m^2)
FAO	Food and Agriculture Organization of the United Nations
FTE	Full Time Equivalent (one man-year of employment)
GDAR	General Directorate of Agrarian Reform
GDP	Gross Domestic Product
GoT	Government of Turkey
GVA	Gross Value Added
Ha	Hectare (1 hectare = 10 decare = 10,000 m^2)
LC	Land consolidation
LCP	Land consolidation project
M&E	Monitoring and Evaluation
MoFAL	Ministry of Food, Agriculture and Livestock
PD	Project Document
RD	Rural Development
SEA	Strategic Environmental Assessment
TL	Turkish lira
TL	Team Leader
TUR	Turkey
UN	United Nations

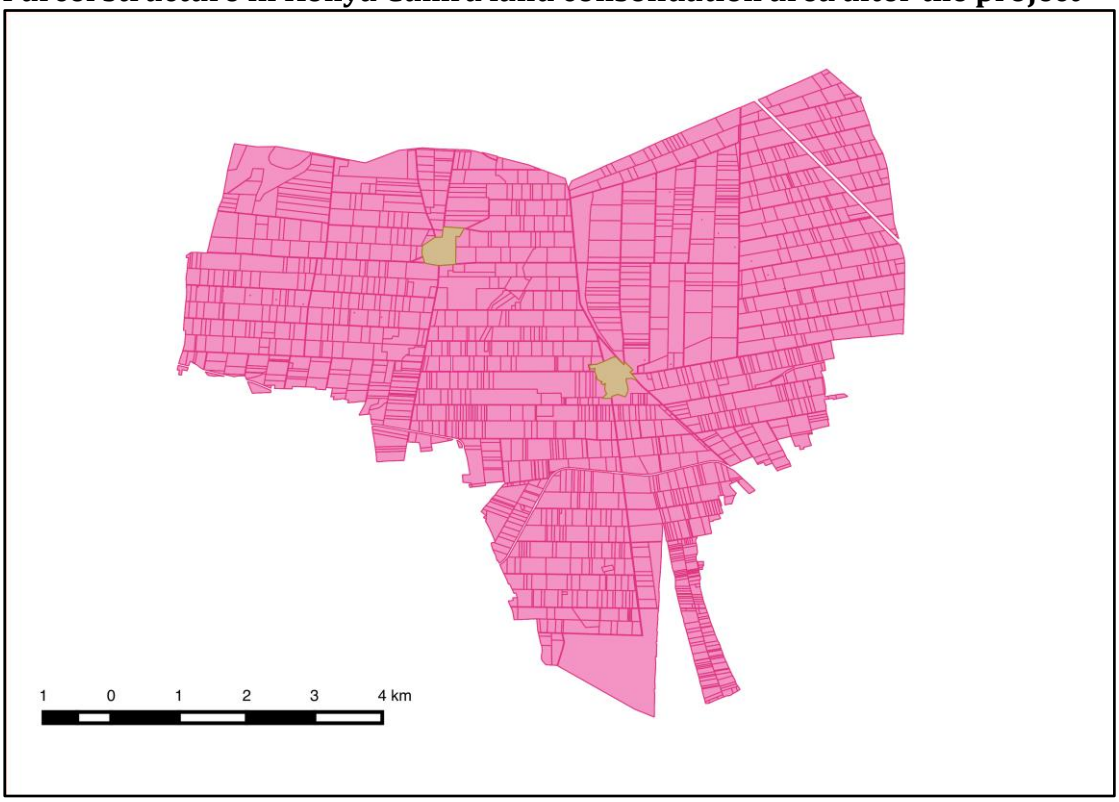
Maps

Turkey

Konya Region

Parcel structure in Konya Cumra land consolidation area before the project

Parcel structure in Konya Cumra land consolidation area after the project



1. Foreword

This Pilot Evaluation Report is prepared as the main outcome of the project "Strengthening of national and institutional capacity on land consolidation" (UTF/TUR/060/TUR). The project is implemented by FAO and funded by the FAO – Turkey Partnership Programme.

It is the hope that the report will give valuable input to the Turkish Ministry of Food, Agriculture and Livestock, the General Directorate of Agrarian Reform on the impact of the large Turkish land consolidation programme and provide input to setting up of monitoring and evaluation procedures for evaluation of projects and in the future of the complete programme as well.

Many countries in Europe have on-going land consolidation programmes. Few countries have, however, established thorough and systematic monitoring and evaluation of the land consolidation efforts, especially in terms of the economic impact for the beneficiaries and rural project communities. Thus, it is the hope that the pilot evaluation and the evaluation methodology designed in the project will be relevant outside of Turkey as well.

FAO REU is thankful to the following institutions and persons for their support in the preparation of the pilot evaluation:

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Without the support partly of technical character in terms of input about the content of land consolidation in Turkey in general and in the project area in Konya Cumra in particular, partly of work organisation, mobilization of staff, logistics and recruitment of farmers for the interviews, it would not have been possible to accomplish the pilot evaluation in the relatively short period of time from June to September 2015.

The international consultant Mr Morten Kvistgaard as well as FAO REU appreciate this support very much.

FAO REU

Morten Hartvigsen
16 October 2015

2. Executive summary

2.1. Objectives

This pilot evaluation of the Konya Cumra land consolidation project in the villages of Inli and Dinlendik (Cumra district) has three overall objectives formulated on the basis of the expected impact, results and output in the Project Document (PD):

1. To accomplish a *pilot evaluation* of one selected Land Consolidation Project (LCP) in order to provide knowledge and documentation about the economic and production related results and impacts of the land consolidation project and furthermore to prepare a *methodological description* on how the pilot evaluation was accomplished. This description shall contribute to capacity building of GDAR and serve as a methodological guideline for the implementation of other land consolidation projects by General Directorate of Agrarian Reform (GDAR)

2. To assess the *land consolidation procedures* and provide recommendation for improvements, if relevant

3. Prepare input to a *regional conference* on land consolidation (LandNet Conference 4 – 8 October 2015 in Ankara)

2.2. Methodology

The pilot evaluation is based on a number of steps from the table next page. The table provides a comprehensive list of steps to take as a suggested methodological guideline for similar evaluations:

Summary of suggested evaluation methodology

Step 1	Determine the objectives of the evaluation and the methodology to be applied (data collection, types of data)
Step 2	Determine the selection criteria for the project to be selected for evaluation and select the project
Step 3	Reconstruct the intervention logic for the selected project
Step 4	Determine the selection criteria for selection of a control area and select the area
Step 5	Determine the required statistical solidity of the survey, if quantitative data collection is needed
Step 6	Test questionnaires through pilot interviews of core respondents
Step 7	Adjust questionnaires based on step 6 and accomplish the needed number of interviews
Step 8	Select and describe evaluation criteria and evaluation questions
Step 9	Determine evaluation questions and criteria for dead weight and leverage effects
Step 10	Description of the selected project, including the baseline situation
Step 11	Analysis of current situation in agriculture as background and reference frame
Step 12	Reporting, presentation and dissemination of evaluation results
Step 13	Use evaluation results as input to adjusted and improved policy interventions

2.3. Conclusions

The main conclusions of the pilot evaluation are summarized below.

Outputs

Fragmentation
Reduced fragmentation was an important objective of the land consolidation project. The objective has been fulfilled. The number of parcels in the land consolidation area is reduced with 38% from 2,531 to 1,559, and the average size per parcel is increased from 2.38 ha to 3.87 ha equal to an increase of 1.5 ha or 63%. Furthermore, the surveyed farmers have reduced their number of parcels from 7.1 parcels before the LCP to 2.7 parcels in average after the LCP. This is a reduction of 61% and thus far more than the average for the project area (38%).

Rural roads
The objective is fulfilled. 100% of the parcels have now access to roads, against 63% before the LCP. In order to make this happen, the project has invested in new rural roads leading to an increase in the road network from 115,084 meters of roads to 193,729 meters of roads, equal to an increase of 68%.

Irrigation and access to water
The objective is fulfilled, since 100% of the parcels now have access to water for irrigation purposes. Before the LCP it was 21%. In order to ensure this, the irrigation system is increased from 111 km to 153 km, an increase of 38%.

Financial effectiveness
The project is operationally accomplished mostly within the planned implementation period, which is satisfactory. The budget was 1.9 million TL[1] and the account shows expenditures of 1.7 million TL. The budget was respected, and only 91% of the resources were utilized to fulfil the technical objectives 100%.

Results and impacts

Parcel pattern and related costs
The pattern of the parcels has been improved. The number of squared and rectangular parcels has increased from 789 of the parcels to 1,121 (42% increase), while the number of parcels with irregular shape went down from 862 parcels to 173 equal to a reduction of 80%. The costs related to ploughing and transport as well as to labour employed with these tasks are reduced from 3 million TL before the LCP to 2.6 million TL after the project - a reduction of 11%.

Water
The documented shift in irrigation principles/technologies from surface flooding to sprinklers, drip irrigation and automobile irrigation robots leads to increased effectiveness of water use. The method of irrigation was predominantly based on surface flooding for a limited area before the LCP, and has afterwards been changed to the pressurized types of irrigation for the whole area. The water consumption has increased with 28%, but the water use per hectare has also been reduced to 28% of the usage before the project. Increased irrigation effectiveness has increased yield and provided better product qualities as a consequence.

Land use
The LCP has contributed to an increase in hectares under crops. In total, the increase is 135 ha equal to 10%. In particularly the area with maize and sugar beet has increased, while a few crops have been reduced (sunflower and potato). The development and the change among the crops is to a large extent market and price driven, but the overall increase in the production of crops (number of hectares) must be considered a positive result of the LCP itself.

Productivity
Except for barley, all crops demonstrate an increase in yield per hectare from the year before the LCP compared to the year after the LCP in the range from 11% to 25 %. The yields of wheat (5.1 tons/ha) and sunflower (3 tons/ha) in the project area are both better than the Turkish 5 year average of 2.6 tons/ha and 2.3 tons/ ha respectively. Maize yield is almost on line with the Turkish average, and 11% higher than in EU.

[1] Exchange rate: 100 TL = 50.4 EUR september 2010. The budget of 1.9 million TL = 958,000 €.

The yield per hectare per man-year has increased from 2.26 tons (average crop) in 2009 to 2.8 tons in 2013. This is an increase in labour productivity of 24%.

Value of production
The farmers have increased the value of production with 30.2% from the last year before the LCP (2009) and to the first year after the LCP (2013). This is an average increase in production value of 7.5% per year. Inflation has taken 7.2% per year, but still the real growth has been positive with 0.3% per year, while the real growth in the value of production of Turkish agriculture and agriculture in EU was -0.8% and -0,4% respectively from 2010 to 2014.

Investments of farmers
The evaluation shows that the 67 farmers participating in the survey have invested 5.1 million TR[2] the first year after the finalization of the LCP. It is 76,500 TR in average per farmer. If all active farmers have followed the same investment pattern, the total investment level of the farmers in the two villages is then estimated to be 14 million TL (6.9 million €).

Efficiency

In summary it can be concluded that 1 million TR (492,000 €) in the LCP investment generates:

- Increased parcel size of 31%
- Reduced fragmentation (number of parcels) of 23%
- Increased number of optimal shaped parcels with 25%
- 45.700 meters of rural roads constructed
- Reduced farm work and transportation costs with 7.8%
- 24,300 meters of irrigation systems
- 8.2 million TL (4 million €) in private farmer investments in total
- 5 million TL (2.46 million €) in private farmer investments due to the LCP

Would the farmers have participated in re-parcelling on their own?
There are some variations among the farmers in their perception of to what extent they would have participated in land transaction activities also without the LCP. 51% would most likely have joined land swapping, while 57% most likely would have been involved in purchasing or selling of land. However, 46% would not do any land swapping and 40% would not do any buying/selling.

Procedures and administration
The land consolidation approach is comprehensive and compulsory. The LC project (re-allotment plan) is implemented when 2/3 of the landowners in the project area, representing more than 50% of the land, agree with the plan. The projects are implemented by private geodetic companies selected after a tender process and supervised by a project control engineer from the provincial department of MoFAL/GDAR.

[2] Exchange rate September 2013: 100 TL = 49.2 €. 5.1 million TL = 2.5 million €.

Farmers' satisfaction with LCP

The farmers' satisfaction with the LCP is outspoken. 84% of the interviewed farmers are to a large extent satisfied with the LCP. Only 9% are either not at all satisfied or not too much satisfied. The conclusion is clear: The LCP in Konya Cumra has been accomplished to big satisfaction of the farmers involved in the project.

The satisfaction among the farmers is also high regarding the various steps included in the land consolidation procedures, although a smaller group of farmers between 10% and 15% either are not at all satisfied or not too much satisfied. Thus, there is still some work to do in order to increase the level of satisfaction even higher, in particularly for the soil grading (land valuation), where 45% of the farmers are critical to some extent.

2.4. Recommendations

The following recommendations are provided to MoFAL/GDAR for consideration. It is recommended to:

- Elect a committee of local stakeholders to represent the general interests of the local stakeholders in the land consolidation process.
- Review and improve the land valuation process.
- Encourage and facilitate sales – purchase agreements as an integrated part of the land consolidation process.
- Introduce a State Land Bank to support land consolidation projects.
- Invest more in capacity development of staff involved in implementation of LC projects.
- Introduce systematic ex ante environmental impact assessment (or SEA for bigger projects) of land consolidation projects (EIA) as an integral part of the preparatory work.
- Establish a comprehensive baseline description before implementing the LCP, related to the objectives of the LCP.
- Conduct more pilot evaluations of land consolidation projects selected in mountain areas and with animal/livestock production and prepare for future programme evaluation.
- Let environmental impact assessments be an integral part of the ex post evaluation of land consolidation projects and of the programme as a whole.

3. Introduction

3.1. Background

The development of agriculture has a high priority of the Turkish Government (GoT) and of Ministry of Food, Agriculture and Livestock (MoFAL). Several reforms have been introduced during the period from 2002 to 2013[3], both on national initiatives and on initiatives of the EU as a part of the EU negotiation process. However, there is still a big need for a continued focus on the reform process of the sector.

The development of the agricultural sector in terms of value of production and of productivity (labour productivity) has to some extent been positive from 2010 to 2014, but the development has not been so strong and convincing as could have been expected, taking the many reforms into consideration (see also chapter 5 for more information about the state of development of Turkish agriculture).

One of the major challenges for the development of agriculture in Turkey is the dominating small scale and fragmented farming structure. In 2014, the number of farms in Turkey was 2,214,500 with an average size of 6.7 ha. Only 11 % of the farms have a size of more than 50 hectares, while 48 % have between 10 and 50 hectares. More than 41 % of the farms have a size below 10 hectares. The average number of parcels of each farm is 10 with an average parcel size of 0.6 ha. The structure of the farms reduce the possibilities for the farmers to invest in appropriate technologies and thus to increase productivity (labour and total factor productivity), reduce unit costs and improve quality of the products. Furthermore, the fragmented structure of the farms also implies that few of the farms have full access to the rural road network and to water and irrigation, which also is restricting the competitiveness of the individual farmers.

The overall consequence of this structure is that the farmers and the rural communities loose the possibilities to take advantage of the potentials of the land, which in many regions and districts is excellent and supported with good agro climatic conditions. Weak development leads to lower income and thus to a lower development of life qualities than could otherwise be the case. It is therefore of paramount importance that an effort to reduce fragmentation and to improve the infrastructural conditions for farming in Turkey are improved. The Land Consolidation programme of MoFAL and of GDAR is one important instrument in this context.

Land consolidation in Turkey began in 1961 and was in the initial stage supported by FAO. Since 1961 and until 2002, 450,000 ha were consolidated with the help of public investments and facilitation. From 2002 to 2013 additional 4.5 million ha were consolidated, and the DGAR is currently implementing its large-scale plan, where more than 14 million ha are planned to be consolidated from 2014 to 2023, equal to more than 1 million ha per year.

[3] Structural changes and reforms of Turkish agriculture 2003-2013, MoFAL, April 2013.

On the one hand, the structural need for land consolidation is obvious, on the other hand the land consolidation effort also represents a huge public investment, which maybe could be used better to other forms of support to the sector. Thus, it is important continuously to monitor and to evaluate, to what extent the praxis of land consolidation is optimal leading to the best results in the cheapest way, and to monitor and evaluate to what extent the land consolidation projects and the resources, they represent, generate the expected results and impacts for the farmers in the involved areas, in terms of increased productivity, quality and eventually in farm income and quality of life.

Even though land consolidation has been a priority for decades in Turkey, no comprehensive evaluation of the land consolidation projects has been conducted. This evaluation project is the first attempt to report broader results and impacts of the programme based on the evaluation of one specific land consolidation project. The evaluation project may thus be useful as inspiration for responsible authorities to initiate other evaluations, in Turkey as well as abroad.

3.2. Objectives of pilot evaluation project

This pilot evaluation of the Konya land consolidation project in the villages of Inli and Dinlendik (Cumra district) has three overall objectives formulated on the basis of the impacts, results and outputs stated in the PD:

1. To accomplish a *pilot evaluation* of one selected LCP in order to provide knowledge and documentation about the results and impacts of the land consolidation project and furthermore to prepare a *methodological description* on how the pilot evaluation was accomplished. This description shall contribute to capacity building of GDAR and serve as a methodological guideline for the implementation of other land consolidation projects by GDAR

2. To assess the *land consolidation procedures* and provide recommendation for improvements, if relevant

3. Prepare input to a *regional conference* on land consolidation (LandNet Conference 4 – 8 October 2015 in Ankara)

3.3. Working process

Based on a project formulation mission in May 2013, a draft Project Document (PD) was prepared by FAO and discussed between the parties. The final project document was bilaterally signed between MoFAL/GDAR and FAO-SEC as executing partner. The project is funded by the FAO – Turkey Partnership Programme.

The project was officially opened with a mission[4] from 2 - 6 June 2014, where workshop based training of staff in GDAR and other invited institutions about the principles of monitoring and evaluation (M&E) in general and of land consolidation projects in particularly took place.

The training included a session on selection of a land consolidation project as pilot project for this evaluation. In order to avoid biased selection of one project instead of another, a number of basic selection criteria were decided, and based on these criteria, the full portfolio of land consolidation projects in Turkey was assessed and one specific very typical project was selected.

The methodological approach for the evaluation was prepared during a mission to Ankara in May 2015[5], and draft questionnaires to farmers in the village of Inli, central and regional authorities and other stakeholders were tested through pilot interviews in the project area and in Ankara. Based on these pilot interviews, the draft questionnaires were adjusted together with staff from GDAR and finalized.

During July, August and September 2015[6], a number of interviews were accomplished with farmers in the project are, as well as with farmers in a selected control area. This control area is similar to the project area, with the main difference that no land consolidation has been accomplished in the control area. Comparing the results from the interviews in the control area with the results from the interviews in the project area, it is possible to assess the results of the impacts of the LC project in the pilot area against the development of central indicators in the control area.

Data from the interviews and data otherwise collected though databases and literature research were analysed in September and reported in a draft evaluation report by end of September 2015.

After consultations with GDAR, the final report was submitted to GDAR 7 October 2015.

Finally, the results of the evaluation were presented by international consultant Morten Kvistgaard at the regional LandNet Conference organized by MFAL/GDAR and FAO and accomplished in Ankara during 5 – 7 October 2015.

[4] On the first mission participated Richard Eberlin and Morten Hartvigsen, FAO REUT, international consultant Morten Kvistgaard, Denmark, and international consultant Jan van Rheenen, The Netherlands.
[5] On the second mission participated international consultant Morten Kvistgaard, Denmark
[6] A third mission was accomplished 31 August to 4 September. Morten Hartvigsen, FAO REUT and international consultant Morten Kvistgaard, Denmark, participated.

4. Evaluation methodology

This section of the report provides a description of the methodological principles applied in the pilot evaluation. Emphasis is put on how the sequential logic of the steps in the evaluation process should be implemented, and which decisions should be made and why during the process. All steps are not necessary and relevant in all projects and under all circumstances, and the specific evaluation design should be adapted to the context as well as to the resource situation.

4.1. Determining the focus of the evaluation activities

Point of departure for any evaluation activity or project is to determine the focus and the objectives of the evaluation project. The overall objective may relate to an ambition about mapping and documenting the benefit of the policy intervention and policy instruments at the micro level (farmers level), the meso level (the sector) and the macro level (the economy as a whole), or it may be related to improvement of administrative praxis or to enhanced accountability of the use of public money.

When the overall objective is determined, the next steps in the overall methodology can be applied.

In this pilot evaluation, the focus has been on assessing a) the economic results and impacts of the LCP and b) the land consolidation procedures, and resources have not been available for a comprehensive evaluation of environmental impacts. An Environmental Impact Assessment or a Strategic Environmental Assessment should be a part of the preparatory work before the LCP is initiated. Ex post, an assessment of the environmental impact should in future evaluations be part of the objectives hierarchy of the evaluation.

4.2. Selection of pilot evaluation project

It is difficult and also expensive to evaluate all projects in a given programme. This is also the case with the Turkish Land Consolidation programme, which includes around 200 projects implemented or ongoing since 2009. Thus, it is important to select one project or a group of projects representing the whole programme. The first step in the evaluation is to select the project to be evaluated.

4.2.1. Selection Criteria

During the mission of the FAO project team in June 2014, it was agreed with GDAR and FAO-SEC to select the pilot project based on the following criteria:

Table 4.1: Project selection criteria used in pilot evaluation project

1	Total costs of project (TL)
2	Total size of project area (ha)
3a	Total number of parcels before
3b	Total number of parcels after
3c	Fragmentation reduction index (3a/3b)
4	Number of landowners before project
5	Area type (plain, hilly, mountainous)
6	Main agricultural production (crops, fruits and vegetables, livestock and animal products, others)
7	Is improved irrigation part of project (yes, no)
8	Importance of existing nature in project area (high, medium, low)
9	Are measures to combat erosion included in the project (yes, no)

Source: Workshop on M&E of LCP, GDAR, June 2014

4.2.2. Selection process

In order to select the pilot evaluation project, the following selection process was followed:

1. An Excel sheet with selection criteria presented above was prepared. In order to define the typical land consolidation project in Turkey, data for all land consolidation projects in the country initiated in 2009 or later and already finalized by June 2014 was filled into the sheet using the GDAR land consolidation project database as source. The typical (average) project was identified for each of the 9 criteria.
2. All land consolidation projects started in 2009 or later and already finalized in a travel distance of 3 hours from Ankara were prioritized due to resource reasons.
3. The one project within 3 hours travel distance from Ankara with the best match with the identified typical project was selected for the pilot evaluation.

It is important to stress that the selected LC project in Konya differs from many other projects in spite of the criteria based selection process, among other things due to the additional 3 hours travel time criteria from Ankara. Major differences of the Konya Cumra project to others projects are that the agricultural production almost exclusively is industrial crops such as wheat, corn, barley, beets, beans, sun flower etc., while livestock and animal products as wells as larger scale of fruits and vegetables production is absent. Furthermore, the farms in the villages of Inli and Dinlendik are bigger than the average farms in Turkey. The average farm size in the project area is 15 ha[7], while it is 6.7 ha in Turkey in general. In this respect the pilot evaluation is biased towards bigger farms with industrial crops, and the evaluation results may not represent the complexity of LCP in areas with livestock production, fruits and vegetables and with a typical mountainous landscape contrary to the plains of Konya.

[7] The average farm size based on owned land before the LCP is 6 ha in Inli and 2.5 ha in Dinlendik, but many landowners do not utilize their land and rent it out to active farmers.

4.3. Reconstructing the intervention logic for the selected pilot evaluation project

Evaluating a project defined and initiated and maybe even also implemented several years ago requires that the rationale behind the project formulation is reconstructed. This is nominated the *reconstruction of the intervention logic* behind the project.

This was also accomplished in this evaluation through interviews with central persons in the LC Department of DGAR, in the regional directorate of MoFAL/GDAR in Konya and with other stakeholders. The GDAR pre-study outlining the problem analysis and the needs and challenges for the region/district/project area as well as the Project Document and tender documents related to the tender procedure of the LCP were also studied.

The intervention logic is presented as the objectives hierarchy of the project, meaning the overall, the specific and the operational objectives and the related quantified targets for outputs, results and impacts. The reconstructed intervention logic for the Konya Cumra project is presented in section 4.9 below.

4.4. Selection of a control area

In order to be able to map the results and the impacts of the LC project, a control area[8] similar to the LC project area in terms of production structure, agro-climatic zone, land fragmentation etc. was identified and included in the survey. A small number of selection criteria were used, but this is considered acceptable under the given resource conditions for the pilot evaluation project. Additional and more detailed criteria similar to the list of criteria in table 1 above may be used for other control areas in other evaluations. In the present pilot evaluation, the village of Arikoren 19 km from Cumra in Konya region was selected. GDAR and the LC Department together with the Regional Directorate of MoFAL/DGAR in Konya assisted the FAO project team in the identification of this control area in the region.

4.5. Statistical solidity

It was not technical and financial possible and not relevant for the FAO project team to make interviews will all farmers involved in the LC project in the Inli/Dinlendik project. Thus a sample of farmers was selected. The size of the sample was decided based on a decision on the required statistical validity of the survey results. The higher the statistical validity is required, the bigger the number of interviews must be. The decision on statistical validity will always be a trade off between the political importance of the results of the evaluation and the resources available for the survey.

[8] The introduction of a control area is in compliance with the basic criteria of methodological triangulation, where survey data are assessed against two other types/sources of data: Here the data from the control area, and data from the macro level of Turkish and EU agriculture.

The tables below shows how many accomplished interviews that was needed in order to have a certain statistical validity, due to the size of the full population of active farmers in the two villages.

Table 4.2: Number of active farmers in the project area

Total population of active farmers	*183*
Inli (information from interview in Inli)	122
Dinlendik (information from interview in Dinlendik)	61

Source: Data from interviews with water association management in Inli and Dinlendik, 2015

A 10 % statistical error (uncertainty) was accepted in this evaluation, and the required number of active farmer interviews in the two villages in the LC project area is 63, of which 42 are in Inli and 21 are in Dinlendik, see table 4.3 below.

Table 4.3: Needed number of interviews among active farmers

Decided level of statistical uncertainty, %, based on 95 % confidence interval	5	7.5	**10**	12.5	15
Total number of needed interviews	124	112	**63**	52	38
Interviews in Inli	82	60	**42**	32	25
Interviews in Dinlendik	42	29	**21**	14	10

The conclusion was that a statistical error of 10 % was acceptable, and considered feasible (63 interviews) with the available resources of the project, and with support provided by MoFAL/GDAR centrally in Ankara and regionally in Konya.

4.6. Pilot interviews

Drafted questionnaires for DGAR authorities (LC procedures and practice), Local authorities (project intervention logics), Village managements (overall perception of project objectives and benefits) and Farmers (outputs, results and impacts of the LC project as well as satisfaction with procedures and their management and implementation) were tested during the mission in May 2015. These test interviews were accomplished in Regional Directorate of MoFAL, İnli Village Watering Cooperative, by the İnli Village Headman and by İnli Farmers.

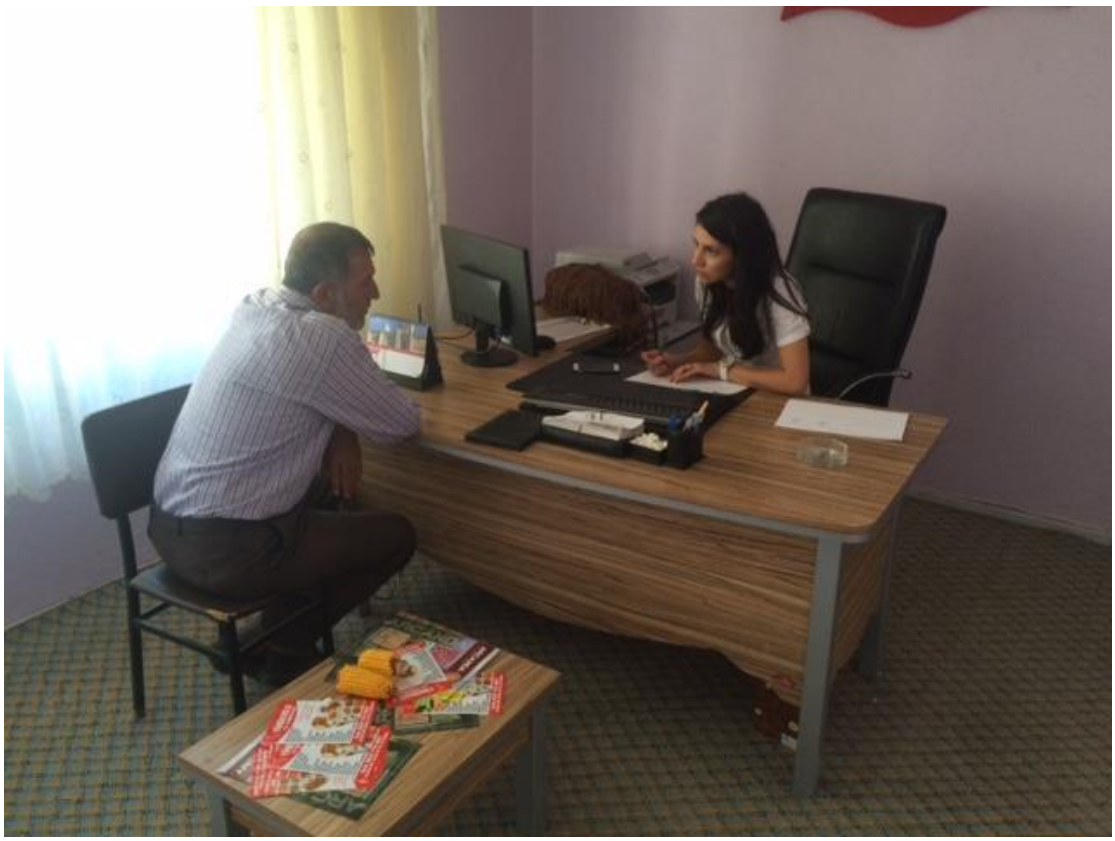
After the test interviews, the evaluation team adjusted the questionnaires in close cooperation with staff from DGAR, Land Consolidation department.

The test interviews were also used to test the interviewers, to make them familiar with the interview situation and thus to build up the needed competences partly to carry out the required number of interviews, partly to instruct additional interviewers. It is important to stress that the instructions of the interviewers is important to ensure the needed quality of the replies from

the respondents. Thus, the interviewers must understand the rationale of the survey and feel familiar with the meaning of the individual questions.

4.7. Interviews

Personal interviews were conducted with farmers in Inli and Dinlendik during July, August and September 2015 by the national consultant from the FAO project team and by instructed staff from FAO-SEC, DGAR LC staff and from the Konya Regional Directorate of MoFAL. Interviews were also accomplished in the control village Arikoren during September. In this evaluation personal interviews were used. Under other circumstances telephone or web-based interviews can be used, but these options were not considered relevant in this case (lack of email access among the farmers, relatively big complexity in the survey questions, evaluation of a project some years old etc.). The more expensive and time-consuming personal interview model was chosen. The table below summarizes the number of interviews needed and accomplished in order to ensure the evaluation the decided level of statistical solidity.



Landowner interview in Cumra in September 2015

GDAR in Ankara as well as Konya Directorate of MoFAL and the management of the water associations in the two villages were all very supportive and participated in the organization of the interviews, the mobilization of farmers to participate in the interviews, with transport and other logistic support as well as with important information of the project and its activities.

Table 4.4: Number interviews accomplished, total statistical uncertainty, %

Item	*Inli*	*Dinlendik*	*Total*	*Control area: Arikoren*
Active farmers	122	61	183	n.a.
Required	42	21	63	10
Accomplished	43	21	64	11
Statistical uncertainty, +/-	n.a	n.a	**10**	n.a.

Source: Own calculations

The required level of statistical solidity (uncertainty of the survey result of +/- 10 %) was achieved. Please observe that there was no decision in the project management and in GDAR on the level of statistical uncertainty in the control area, and it was decided by the FAO project TL to accomplish around 10 interviews in the area in order to establish a reference set of data. This goal was achieved with the 11 interviews. Principally, the number of accomplished interviews in the control area should reflect the population of active farmers and a statistical validity similar to the one decided for the project area. However, it was not possible to accomplish the required number of interviews in this evaluation due to time and resource constraints. Thus the information from the eleven control area interviews serves as reference data.

The recruitment of farmers to the interviews was accomplished by the village management and the Provincial office of GDAR/MoFAL. The TL had no direct control over the recruitment, and it may have influenced the validity of the replies. The farmers recruited to the interviews could be positively biased towards the LCP due to various reasons, and they could thus be more positive than other farmers in the project area.

4.8. Evaluation criteria

Internationally recognized evaluation criteria are used in the evaluation. These criteria are used to structure the evaluation and to make sure that all essential evaluation questions are answered. The evaluation criteria and the related evaluation questions are:

Relevance
The core evaluation questions are: To what extent are the accomplished activities of the Konya Cumra LC project relevant for the objectives of the project itself (internal relevance) and for meeting the needs and challenges in the project area identified in the pre-study and used in the tender document as justification for the project (external relevance)?

Effectiveness
To what extent has the objectives and the relevant quantified targets of the project been fulfilled?

Effects
What are the outputs, the results and the impacts of the project activities for the farmers involved, for the community/villages and for the agricultural sector as a whole?

Efficiency
What are the relationship between benefits (effects) achieved by the project and the costs spent on the activities (value for money)?

Sustainability
To what extent are the effects of the project lasting also after the termination/closing of the project activities? Sustainability is assessed from an economic, an environmental and a social perspective.

4.9. Dead weight and leverage effects

On top of these core evaluation criteria two additional criteria are used. They are dead weight and leverage effect.

Dead weight refers to the extent an investment also would be implemented if no public support was allocated to the project. In case that an investment also would have been accomplished without public support and with private money alone, the public support is considered to be dead weight. Dead weight is negative and should from a political perspective be avoided in order to optimize the public resource use towards the real needs in the society.

Leverage effects refer to the situation where public support to an investment attracts other sources of capital and contributes to lifting the investment level to a higher level than would have been the case without public support. Leverage effects are positive and signal that public support to a given investment has increased the investment and activity level on the economy beyond what would have been the case without public support.

4.10. Description of the Konya Cumra Land Consolidation project

The land consolidation project selected for this pilot evaluation is the project located in Konya Region, Cumra District covering the territory of the two villages Inli and Dinlendik.
Konya Region (Konya City) is located 260 km south of Ankara, and Cumra is located further 50 km south East of Konya. The villages Inli and Dinlendik are located additional 12 and 16 km further South East of Cumra.

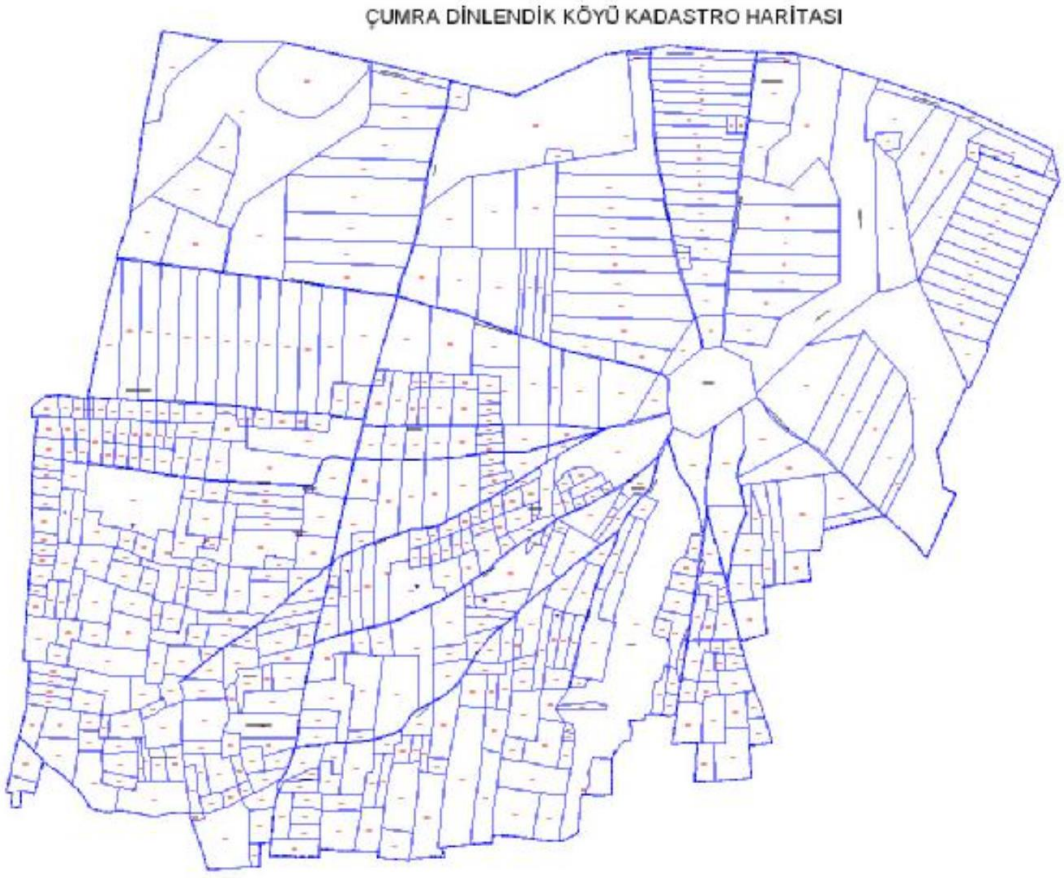
Due to the plains and the agro-climatic conditions, the area is appropriate for production of cereals and crops for industrial purposes (wheat, barley, corn, sugar beet, sun flower etc.), while commercial livestock production and

production of fruits and vegetables to a large extent is absent and only play a minor commercial role.

The population living in the two villages is small (only a few hundred people), and has been declining over the years. People are moving to Cumra, where the facilities and the living conditions are considered to be better. A total of 1,095 persons are registered unique landowners in the villages Inli and Dinlendik, but many of them live other places, in particularly in Cumra. The number of registered active farmers is 183. The project area coves a total of 6,588 ha distributed with 4,752 ha in Inli and 1,835 ha in Dinlendik.

The agricultural area is in total 6,031 ha. Before the LCP, the area was characterized of a relatively high degree of fragmentation with 1,987 parcels for agriculture each of 2.35 ha in average in Inli and 544 parcels each of 2.5 ha in average in Dinlendik. The cadastre map of the village of Dinlendik before the project is inserted below as figure 4.1 to illustrate the fragmentation problem. In addition, many parcels had an irregular shape.

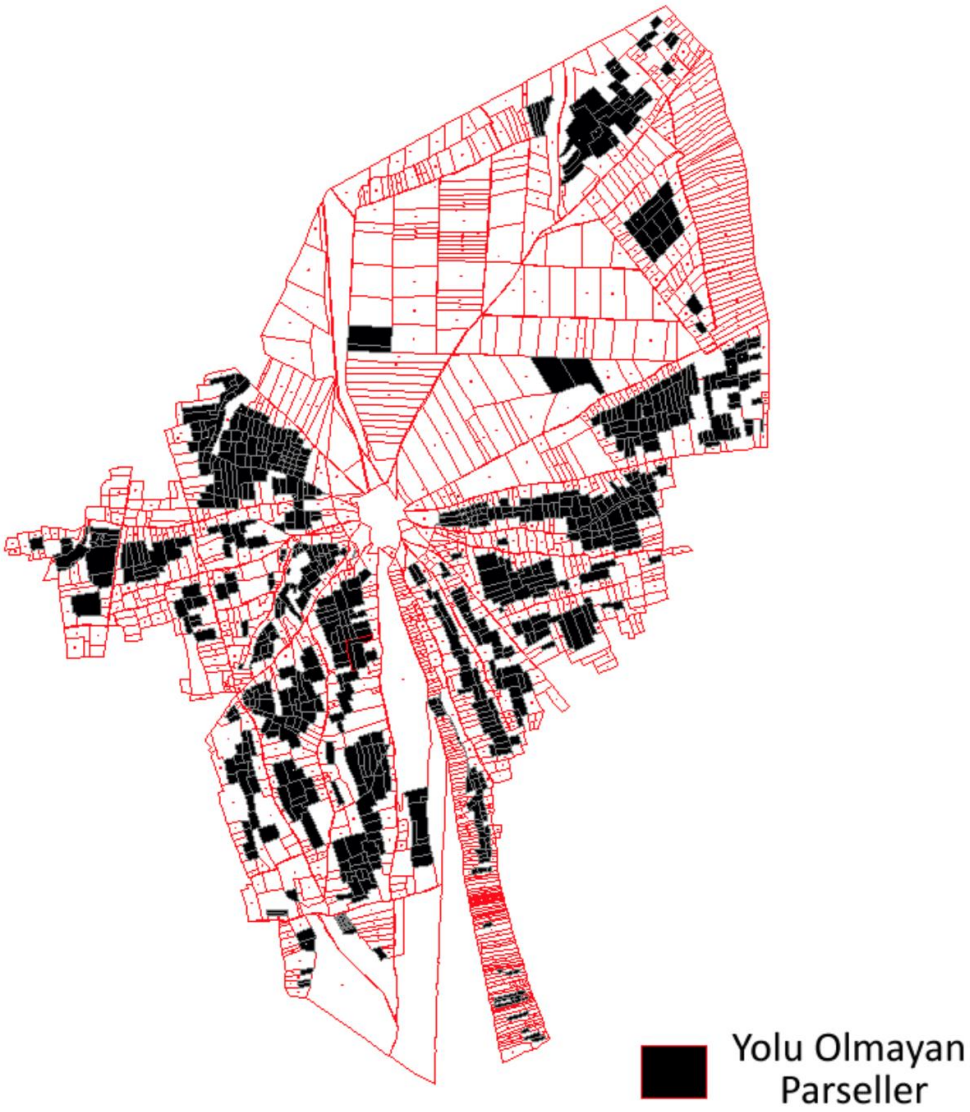
Figure 4.1: Cadaster map of Dinlendik, 2009



Source: Regional office of MoFAL/GDAR, Konya: Data from pre-study report 2009

The road network was before the project not fully developed, and only 63 % of the parcels had access to the local road network. See figure 4.2 illustrating the road access for parcels in Inli village prior to the LCP. Black parcels had no road access.

Figure 4.2: Parcels without road access, Inli.



Source: Regional office of MoFAL/GDAR, Konya: Data from pre-study report 2009

The common irrigation system was sprinkling and surface flooding, but only 21 % of parcels had access to water for irrigation. Wells were used both by the water cooperatives in the two villages and by private well owners, but the water level has been decreasing over the years. Now the pumping takes place in the depth of 100 meters.

Thus, the three main challenges for the project area were a high degree of fragmentation, weak access to roads and in particularly weak access to water for irrigation.

Based on these challenges, the intervention logic for the project is reconstructed here as follows:

Overall objective: To increase economic growth and income of the agricultural sector in the project area.

Specific objectives: To increase production, productivity, product quality and to reduce costs for the farmers in the area.

Operational objectives: To facilitate and implement through a number of specific activities a land consolidation project with the help of an active and participatory approach leading to reduced fragmentation, increased access to rural roads for parcels by investing in new rural roads and increased access to irrigation channels by preparation and renovating of irrigation channels.

Sprinkler irrigation in Konya Cumra project area after project implementation

The expected effects are:

Impacts: Increase in the value of production and income of farmers (no quantified targets).

Results: Increased production, productivity, product quality and reduced costs for the farmers (no quantified targets).

Outputs: Implementation of a number of project specific activities, (soil grading analysis/land valuation, participatory meetings/workshops individually and collectively, drafting of re-allotment plans and ensuring consensus of the final re-allotment plan leading to reduced fragmentation), investment in rural roads and water channels (no quantified targets).

It is one important objective of any evaluation, and also of this, to evaluate to what extent the objectives are fulfilled. The data for the LC project area is

summarized in table 4.5 based on information from MoFAL/GDAR Regional office, Konya:

Table 4.5: Konya Land Consolidation Project area, data before land consolidation

Item	*Inli*	*Dinlendik*	*Total*
Total area, ha	4,752	1,836	6,588
Agricultural area, ha	4,670	1,361	6,031
Registered unique land owners, numbers	776	850	1,626
Registered active farmers, numbers	133	72	205
Holding size, owned land, average ha	6.0	2.5	3.7
Number of parcels	1,987	544	2,531
Average size of parcel, ha	2.35	2.5	2.38
Road network, meters	90,968	24,116	115,084
Parcels with access to road, numbers	1,271	313	1,584
Parcels with access to road, %	64	57	63
Water channels, meters	73,338	37,685	111,023
Parcels with access to water channels, numbers	367	170	537
Parcels with access to water channels, %	18	31	21
Planned implementation period			Contract: 26.05.2010 Deadline: 03.08.2012
Budget, TL			1,897,157

Source: Regional office of GDAR, Konya: Data from pre-study report 2009.

4.11. Current state of sector: Analysis based on national data

A final methodological principle is the reference of the evaluation data to national data achieved through an analysis of the general trends in Turkish agriculture. The results and impacts for the farmers achieved through the land consolidation project in the villages in Cumra District, Konya Region, must on the one hand be assessed against the overall, general development in agriculture in Turkey and on the other hand assessed against the development in a control area similar to the villages in Cumra, also located in Cumra (see section 3.3 above). Thus, it is important that the development in for example labor productivity and investments in the pilot project are compared with the similar figures at the overall level of Turkish agriculture. Thus, a summary of the development of the agricultural sector in Turkey is presented based on the latest available data and analyses prepared by MoFAL and GDAR. This analysis is summarized in chapter 5 below.

4.12. Reporting, presentation and dissemination

The evaluation is formally finished with the reporting, the presentation of the results for the relevant institutions and authorities, and the evaluation results are disseminated to a broader audience, if so needed and deemed relevant.

Many evaluations are based on data and information collected from various stakeholders, who have invested time and resources in the contributions of these data. Thus, it is recommendable to pay respect for this effort from the stakeholders through an appropriate dissemination of the relevant evaluation results to these stakeholders. Farmers can for example be invited to presentation seminars in the project area, where also the interviews have been accomplished.

4.13. Adjustment of policy interventions

The final step is to take advantage of the evaluation results in adjustments and corrections of existing policy interventions and/or to develop new interventions based on the evaluation results and the lessons learnt.

The idea with all evaluations is to learn from experience in order to improve for the future. Thus, it is highly recommendable to consider how and to what extent the lessons learnt from the evaluation can be used in revised policy action, if so needed. This is the ultimate goal and may contribute considerably to improved efficiency in policy interventions to the benefit, not the least for the farmers and the rural dwellers needing optimal interventions the most.

4.14. Summery of methodological principles

The evaluation methodology used in this evaluation and discussed in the section above is summarized in the steps below.

Table 4.6 Summary of the suggested evaluation methodology

Step 1	Determine the objectives of the evaluation and the methodology to be applied (data collection, types of data)
Step 2	Determine the selection criteria for the project to be selected for evaluation and select the project
Step 3	Reconstruct the intervention logic for the selected project
Step 4	Determine the selection criteria for selection of a control area and select the area
Step 5	Determine the required statistical solidity of the survey, if quantitative data collection is needed
Step 6	Prepare and test questionnaires through pilot interviews of core respondents
Step 7	Adjust questionnaires based on step 6 and accomplish the needed number of interviews
Step 8	Select and describe evaluation criteria and evaluation questions
Step 9	Determine evaluation questions and criteria for dead weight and leverage effects
Step 10	Description of the selected project, including the baseline situation
Step 11	Analysis of current situation in agriculture as background and reference frame
Step 12	Reporting, presentation and dissemination of evaluation results
Step 13	Use evaluation results as input to adjusted and improved policy interventions

5. Agriculture in Turkey: Current state of development

5.1. Strategic priorities of agricultural development

The political interventions for agriculture in Turkey are determined by an overall vision for the development of the sector, where Turkey on the road to wards 2023 will be a country, which provides its population with sufficient, best quality and safe food; develops its net export position in agricultural products; increases its competition power (competitiveness) and is a leader in the field of agriculture both in its own region and in the world. This vision is articulated in more details in the IPARD II programme[9], and in the Strategic Plan (2013-2017) from 2012[10]. Five strategic areas have been determined within the scope of the Plan. These are fully in line with the EU CAP framework:

- Agricultural production and security of supply
- Food Safety providing high quality supply of food and feed
- Plant Health, Animal Health and Welfare
- Agricultural Infrastructure and Rural Development
- Institutional capacity

In order to pursue these strategic areas and the overall vision for the development of the agricultural sector, the intensive investment in land consolidation play an important role and is an important policy tool.

5.2. General development 2010 – 2014

MoFAL and GDAR present a prosperous agricultural sector in their central policy documents, and it is also clear that the sector has developed considerable over the last 10-15 years. However, there are still major challenges ahead. These main challenges are summarized below.

5.2.1. Agricultural productivity and production

An important indicator for the strength or competitiveness of agricultural production in one country compared to another is the productivity level of the main crops[11] (or other types of agricultural production). Table 5.1 below compares the productivity levels of the main crops in Turkey and in EU-27[12] based on a five-year average from 2010 to 2014.

[9]Instrument for Pre-Accession Assistance Rural Development (IPARD) Progamme 2014-2020, MoFAL, GoT, 2014.
[10] http://www.tarim.gov.tr/Links/23/Strategic-Plan
[11] The dominant production in Konya and the LCP area is crops. Thus animal and livestock is not considered here.
[12] It is only the EU-27 average applied, since the period covers years before the accession of Croatia bringing the number of members up to 28.

Table 5.1: Productivity, selected crops, tons/ha, 5 years average 2010-2014

Tons/ha	*Wheat*	*Barley*	*Maize*	*Sunflower*	*Sugar beet*
TUR 5-year average	2.6	2.6	7.9	2.3	55.2
EU 27 5-year average	5.4	4.8	6.9	2.0	72.0

Source: Turkstat 2015 and Eurostat 2015

For wheat, barley and sugar beet we find yields below the EU average (48%, 54%, 77% respectively) while the yields for maize and sunflower are higher in Turkey than in EU (115% and 115% respectively).

The value of the agricultural production of crops and livestock products is presented in the table below. The growth from 2010 to 2014 has been almost 40,000 million TL equal to an average growth of 4.8 %. The real growth measured as the nominal growth in current prices corrected for the average inflation rate of 7.2 % is – 2.4% for the sector as a whole, while it is - 0.8 for the crop sector alone, relevant as reference figure for Konya region and for the land consolidation project.

Table 5.2: Agricultural growth, 2010-2014, million TL and %

Year	*Crops*	*Livestock and animals*	*Total*	*Growth total*	*Growth %*	*Growth crops*	*%*
2010	80,038	85,001	165,039	n.a	n.a	n.a	n.a
2011	88,979	102,649	191,628	26,589	16.1	8,941	11.2
2012	87,947	112,868	200,815	9,188	4.8	- 1,032	-8.9
2013	92,453	98,115	190,568	- 10,248	-5.1	4,505	5.1
2014	97,988	106,845	204,833	14,265	7.5	5,538	6.0
Total growth 2010-2014				39,794	24.1	97,988	3.3
Average annual growth					4.8		6.5
Real annual growth, average					-2.4		-0.8
Real annual growth, average, EU-28					1.4		-0.4

Source: Turkstat and Eurostat. Average annual inflation rate: TUR 7.2, EU 1.8.

Based on these general performance indicators from Turkey and from EU, the expectations to the performance of the farmers in the LCP area cannot be high at this stage, but the influence of the LCP may contribute to better than average results. This will be assessed in chapter 6.

Regarding the trend in gross value added (GVA = sales value of the production minus variable costs) and employment in the sector the picture is a little better without being significant. The GVA has increased with 35,000 million TL or 33% from 2010 to 2014, but the share of GDP has declined from 9.5 % in 2010 to 8 % in 2014. The job creation in agriculture observed in the first years from 2010 to 2011 has been changed to a reduction in 2013 and 2014 to around 5.2 million full time jobs (Full Time Equivalents).

Labour productivity is measured in monetary terms as the Gross Value Added generated per each full time job (GVA/FTE) and has increased from 20,532 TL in 2010 to 26,920 TL in 2014. The average annual growth in current prices is 7.8 %. Corrected for the annual average inflation rate of 7.2 %, the growth in labour productivity seems to be close to zero with an average of 0.5 % in the period. The low increase in labour productivity explains to some extent the increased imports and the weakened trade balance in agricultural products. The trend calls for political action, and reduction of land fragmentation and increased farm size are two important objectives for various instruments including the land consolidation programme of MoFAL and GDAR.

Table 5.3: Agricultural gross value added growth and productivity growth, 2010-2014, TL, current prices

Year	*2010*	*2011*	*2012*	*2013*	*2014*
GDP, Million,	1,098,799	1,297,713	1,416,798	1,567,289	1,749,782
Agri GVA as % of GDP	9.5	9	8.8	8.3	8
Agri GVA Million	104,386	116,794	124,678	130,085	139,983
Employees, FTE	5,084,000	5,412,000	5,301,000	5,204,000	5,200,000
GVA/FTE, TL	20,532	21,581	23,520	24,997	26,920
Annual growth, TL		1,048	1,939	1,477	1,923
Growth, %		5.1	9.0	6.3	7.7
Total Growth, TL					6,387
Total growth, %					31.1
Average annual growth, %					7.8
Inflation, average, %					7.2
Real annual growth, %					0.5

Source: World Bank, TurkStat and MoFAL annual report 2014

5.2.2. Environmental and nature development

The general picture of environmental and nature development in Turkey cannot be drawn up here and reference can be made to the IPARD programme and other documents quoted in the IPARD programme for details[13]. Here it is sufficient to stress the that water management and use of and efficiency in irrigation practices represent an important challenge for agriculture in Turkey due to the given agro-climatic conditions. Water is necessary to increase yield and quality of the products, but overexploitation of scarce water resources may also be contra productive and cause reverse effects on the agricultural production. The

[13] See IPARD II Programme, MoFAL, GoT, 2014

so-called “sink holes” in for example Konya region, where over exploitation of water resources now pumped from more than 100 meters of depth, have caused huge collapses of land in the fields and in villages. These “sink holes” can be more than 100 meters in depth and 50 meters in diameter and represent a concrete physical threat against the sector and the people living in rural areas.

5.2.3. Rural development and the quality of life in rural areas

As was the case in the previous section, reference is here made to other policy documents for details[14]. Here it is sufficient to stress that immigration of the population from rural areas to the major cities is a big challenge for the sector and for MoFAL in general.

The reasons for the immigration are several. One important is the absolute poverty of the rural population compared to the country average and to the population in urban centres. Increased income opportunities for the population in rural areas are thus one important tool to turn the clock and stop immigration.

Another tool is to make available quality rural infrastructure and basic services. These are to a large extent absent today, and people tend to move to locations, where these basic services are provided. This is also the case in the Inli and Dinlendik villages, where migration continues from the villages to the town of Cumra exactly of these reasons.

Thus, the overall objective of rural development policies in Turley as elsewhere is to create better income opportunities in rural area, to increase economic growth and income through job creation, expansion of production and increased competitiveness. The lands consolidation programme of Turkey is an important tool in the toolbox for the fulfilment of these objectives.

[14] See again the IPARD II programme 2014-2020

6. Evaluation of the achievements of land consolidation

A number of main general evaluation criteria and associated evaluation questions are used to structure the evaluation. This chapter presents the main findings from the pilot evaluation structured around these evaluation criteria.

6.1. Relevance

Two evaluation questions are used to provide answer to the degree of relevance of the implemented project and its activities. These questions are:

To what extent are the project activities relevant for the needs and problems, the project is supposed to address?

And

To what extent are the project activities relevant for the fulfilment of the project objectives?

Both relevance questions can be answered positively. The project activities have as a whole contributed to meeting the needs and challenges in the project area regarding fragmentation, access to roads and to water for irrigation. This is the case for the implemented land consolidation procedures from preparation of pre-study and project document/tender documents via public tender to the contracting of a consultancy company to the implementation of the project activities in terms of participatory processes with the farmers in the area, the soil analysis, soil quality grading/land valuation, the drafting of the re-allotment plan, the establishment of consensus about the plan to the finalisation of the re-allotment planning, and it is the case for the entrepreneurial work related to road construction and construction of irrigation systems. Thus the project activities have contributed to the fulfilment of the operational objectives of the project as such. The quality of these deliveries will be assessed below.

6.2. Effectiveness

The discussion of the effectiveness of the project implementation relates to technical effectiveness: *Are the planned deliveries delivered?* and to financial effectiveness: *Are the deliveries delivered within the timeline and the budget?* This section answers these evaluation questions.

6.2.1. Technical effectiveness

To what extent are the technical and output related objectives of the project fulfilled?

Fragmentation

There was no quantitative target stated in advance in the PD regarding the reduction of fragmentation, where the ultimate target is one parcel per

landowner so it is not possible for the FAO evaluation team to assess the achieved consolidation and reduction of fragmentation against any target, although the farmers in the preparation phase of the LCP articulated a wish to eliminate fragmentation completely, and to have only one parcel per farm after the project. This ambition was not an ambition of the LCP. However, the number of parcels is reduced with 38 % from 2,531 to 1,559 and the average size per parcel is thus increased from 2.38 ha to 3.87 ha equal to an increase of 1.5 ha or 63 %[15]. At the general level in Turkey, the fragmentation is 10 parcels per landowner each of 0.6 ha in average and thus a far bigger problem than in this project area[16].

According to the accomplished survey among the active farmers, the farmers have increased their owned land with 3% from 15 ha to 15.5 ha in average, and their rented land with 18% from 9 ha to 10.7 ha. The farmers in the survey have almost no unutilized arable land left after the LCP. All their land is utilized or temporary fallow. The surveyed farmers have reduced their number of parcels with 4.3 parcels to 2.7 parcels after the LCP from 7.1 parcels before the LCP. This is a reduction of 61 % and thus far more than the average for the project area (38%). This is reflecting that the active farmers of obvious reasons take more advantage of the LC than the passive landowners by using more parcels.

Road access

According to the information collected from the Regional Directorate of MoFAL/DGAR in Konya, the target of optimizing road access for all parcels is achieved, since 100 % of parcels have access to roads. In order to make this happen, the project has invested in new rural roads leading to an increase in the road network from 115,084 meters of roads to 193,729 meters of roads, equal to an increase of 68 %.

However, the software developed under the Land Consolidation Cost Analysis Project initiated by GDAR[17] indicates some other figures, where a few parcels still are left without road access. But the overall picture is still that the majority of parcels and hectares (98%) have road access after the LCP.

[15] Source: Regional Directorate of MoFAL/GDAR, Konya.
[16] Source: GDAR.
[17] Information provided by GDAR to the FAO team 23 September 2015. The software calculates the costs linked to ploughing of parcels, transportation to and from the parcels from the village centre and work related to these tasks based on these preconditions: Plough work width = 1.8 m; Plough side space = 0.75 m; Plough speed 3.2 km/hr; Fuel consumption (1km/litre) = 140; Plough count = 10; Speed on main road = 15 km/hr; Fuel consumption on main road (100km/litre) = 20; Travel speed between parcels = 15 km/hr; Fuel consumption between parcels (100 km/litre) = 20; External land visits for irrigation or plant check = 20; Daily work time = 10 hr; Daily work force costs = 30 TL/day; Fuel price = 4 TL/litre.

Table 6.1: Road access before and after LCP, number of parcels and ha

	Before Project		*After Project*	
Road Access Status	*Parcel Count*	*Area (ha)*	*Parcel Count*	*Area (ha)*
Inli				
Parcel With Road Access	976	3141.1	1144	4524.5
Without Access	1036	1562.7	69	58.6
Total	2012	4703.8	1213	4583.1
Dinlendik				
Parcel With Road Access	313	1297.1	343	1750.6
Without Access	233	572.3	30	72.4
Total	546	1869.3	373	1823.0

Source: Land Consolidation Cost Analysis Project software, 2015

Irrigation water access

Water access was limited for many parcels before the project. Thus, this objective to ensure access to irrigation channels for all parcels was important. The target is achieved, since 100 % of the parcels have now access to water channels for irrigation purposes. In order to ensure this, the water channels system is enhanced and increased from 111,023 meters to 152,880 meters, an increase of 38 %.

Summary of effectiveness

Table 6.2 summarizes the technical and financial effectiveness of the LCP.

Table 6.2: Technical and financial effectiveness of Konya LCP 2010-2012

Item	*Inli*		*Dinlendik*		*Total*	
	Before	After	Before	After	Before	After
Total area, ha	4,752	4,752	1,836	1,836	6,588	6,588
Agricultural area, ha	4,670	4,670	1,361	1,361	6,031	6,031
Active farmers, numbers*	133	122	72	61	205	183
Holding size, owned land, average ha	6.0	survey	2.5	Survey	3.7	survey
Number of parcels**	1,987	1,185	544	374	2,531	1,559
Average size of parcel, ha	2.35	3.94	2.5	3.64	2.38	3.87
Road network, meters	90,968	130,085	24,116	63,644	115,084	193,729
Parcels with access to road, numbers	1,271	1,185	313	374	1,584	1,559
Parcels with access to road, %	64	100	57	100	63	100
Water channels, meters	73,338	112,664	37,685	40,216	111,023	152,880
Parcels with access to water channels, numbers	367	1,185	170	374	537	1,559
Parcels with access to water channels, %	18	100	31	100	21	100
Planned implementation period	Contract: 26.05.2010 Deadline: 03.08.2012					
Factual implementation period	Contract: 26.05.2010 Operational closing date: 14.09.2012 Administrative closing date: 05.02.2014					
Budget, TL	1,897,157					
Account, TL	1,728,347					
Account/Budget rate, %	91					

*Source: Regional office of GDAR, Konya. * Data obtained from Regional Office of MoFAL/ GDAR in Konya and estimates based on interviews with village water associations, updated 3 September 2015. ** Figures reported by the Land Consolidation Project Cost Analysis software are slightly different and demonstrates the difficulties in establishing an appropriate baseline for evaluation activities.*

6.2.2. Financial effectiveness

The project is operationally accomplished mostly within the planned implementation period, which is satisfactory[18]. The budget was 1.9 million TL and the account shows expenditures of 1.7 million TL. The budget was respected, and only 91 % of the resources were utilized to fulfil the technical objectives 100%. This is very satisfactory.

6.3. Results and impacts

The main results and impacts achieved from the LCP are summarized below. Other results and impacts are mapped with the help of the conducted survey, but are not reported here.

6.3.1. Parcel pattern and reduced costs

The results of the LCP are many. One important achievement is the reduction in farm costs related to field work and transportation of machinery and produce to and from the parcels. The LCP has on the one hand improved the pattern(geometric pattern) of the parcels in the project area from a situation before the LCP with many parcels of multiple shapes (not right angles) to a situation after the LCP with more appropriate shapes of the parcels (squares and rectangular parcels in stead of triangular and other types of shapes).

Table 6.3: Parcel pattern, number and ratio, Dinlendik and Inli

Before			*After*		
Number of parcels	*Pattern*	*Ratio %*	*Count*	*Pattern*	*Ratio %*
Dinlendik					
7	Square	1,28	21	Square	5,63
122	Rectangle	22,34	238	Rectangle	63,81
22	Triangle	4,03	5	Triangle	1,34
186	Trapezoid	34,07	60	Trapezoid	16,09
209	Irregular	38,28	49	Irregular	13,14
546	Total	100	373	Total	100
Inli					
78	Square	3,88	36	Square	2,97
582	Rectangle	28,93	826	Rectangle	68,1
54	Triangle	2,68	11	Triangle	0,91
645	Trapezoid	32,06	216	Trapezoid	17,81
653	Irregular	32,46	124	Irregular	10,22
2012	Total	100	1213	Total	100

Source: Land Consolidation Cost Analysis Project software, 2015.

[18] Comparison with other land consolidation projects in Turley may be relevant to assess if the financial effectiveness of this project in Konya Cumra is different from the average project, or if the achieved financial effectiveness is typical for the LC programme.

The structure and pattern of the parcels have improved in both villages. The number of squared and rectangular parcels has increased from 789 of the parcels to 1,121 (42% increase), while the number of amorphous parcels went down from 862 parcels to 173 equal to a reduction of 80%. The result of this re-parcelling in terms of reduced costs is presented in the table below.

Table 6.4: Reduced machinery and labour costs, TL, due to improved parcel pattern

Village and types of costs, TL	*Costs before*	*Costs after*	*Change*	*%*
TOTAL, Inli	*2,163,205*	*1,898,762*	*-264,442*	*-12,2*
Plough Distance	1,427,118	1,393,211	-33,906	-2,4
Workforce	687,600	472,500	-215,100	-31,3
Transportation	48,487	33,051	-15,436	-31,8
TOTAL, Dinlendik	*788,542*	*720,894*	*-67,648*	*-8,6*
Plough Distance	569,096	555,967	-13,128	-2,3
Workforce	208,500	158,700	-49,800	-23,9
Transportation	10,946	6,226	-4,719	-43,1
TOTAL, LCP area	*2,951,747*	*2,619,657*	*-332,090*	*-11,3*
Plough Distance	1,996,214	1,949,179	-47,035	-2,4
Workforce	896,100	631,200	-264,900	-29,6
Transportation	59,433	39,277	-20,155	-33,9

Source: Land Consolidation Cost Analysis Project software, 2015

The costs related to ploughing and transport as well as to labour employed with these tasks are reduced from 3 million TL before the LCP to 2.6 million TL after the project. This is a reduction of 11%.

6.3.2. Water technologies

Shift from surface flooding to sprinklers, drip irrigation and automotive irrigation robots leads to increased effectiveness of water use. Surface flooding provides water for irrigation 24 hours, while sprinkler irrigation (traditional and automotive robots) and drip irrigation are much more effective, only providing irrigation when needed following a given plan decided by the farmers. The water use per ha is estimated to be around 50 % lower for sprinkler irrigation and 66% lower for drip irrigation compared to surface flooding[19]. However, the water consumption will increase in total, since the number of parcels with access to water for irrigation has increased from 537 to 1,559 or almost 200%. The area with access to irrigation increased from 1,343 ha to 6,033 ha = 450%.

The method of irrigation was predominantly based on surface flooding for a limited area before the LCP, and has afterwards been changed to the pressurized types of irrigation for the whole area. The water consumption increased with 28.11% for first year after LC. The water consumption per ha with access to

[19] Information from local water associations.

irrigation was reduced from 11,500 m3 to 3,300 m3 equal to only 28% per ha with increased yield and better product qualities as a consequence. Additionally one year later due to seasonal conditions with intense rainfall, the increase in water consumption is diminished to 12.2%.

6.3.3. Agricultural area, main crops

Another important result of the LCP is the increase in hectares under crops. In total, the increase is 135 ha equal to 10%. In particularly the area with maize and sugar beet has increased, while a few crops has been reduced (sunflower and potato). The development and the change among the crops is to a large extent market and price driven, but the overall increase in the production of crops (number of hectares) must be considered a positive result of the LCP itself.

Table 6.5: Main crops, area, ha before (2009) and after LCP (2013)

Crop	*Before, ha*	*After, ha*	*Change, ha*	*%*
Barley	75.7	78	2.3	3
Bean	137.1	153.2	16.1	11.7
Beet	207.3	250.8	43.6	21
Maize	368.6	468.3	99.7	27
Potato	35.0	17.5	-17.5	-50
Sunflower	116.2	89.0	-27.3	23.4
Wheat	434.4	453.1	18.7	4.3
TOTAL	1,374.3	1,509.8	135.5	9.9

Source: Survey, N = 64

6.3.4. Increases in agricultural productivity

One of the main impacts is the increase in agricultural productivity of the area. This is best measured in terms of yield (tons per hectare) for the main crops grown in the area. This is illustrated in the table below.

Table 6.6: Main crops, yield, tons/ha before (2009) and after LCP (2013)

Crop	*Before tons/ha*	*After tons/ha*	*Change tons/ha*	*Change %*
Barley	1.110	0.826	-0.284	-26
Bean	8.015	9.835	1.820	23
Beet	26.110	28.980	2.870	11
Maize	6.329	7.822	1.493	24
Potato	7.325	8.400	1.075	15
Sunflower	2.386	2.975	0,589	25
Wheat	4.071	5.075	1.004	25
TOTAL basket	55.346	63.913	8.566	15
Average basket	7.9	9.1	1.2	15.5

Source: Survey, N = 64

Except for barley, all crops demonstrate an increase in yield per hectare from the year before the LCP compared to the year after the LCP in the range from 11 to

25 %. Many factors may contribute, but it is clear that the increased scale of production made possible due to the reduced fragmentation is an important factor. The content of an artificial average basket of crops has increased from 7.9 tons per ha in 2009 to 9.1 tons per ha in 2013 or 15.5 %.

The yields of wheat (5.1 tons/ha) and sunflower (3 tons/ha) in the project area are both better than the Turkish 5 year average of 2.6 tons/ha and 2.3 tons ha respectively, and for sunflower relatively higher (50% higher) than the EU five year average of 2 tons/ha, while it for wheat is almost at the level of the EU five year average of 5.4 tons/ha. Maize yield is almost on line with the Turkish average, and 11% higher than in EU. The performance of beet and barley is not excellent with 29 tons/ha for beet in the project area against 55 tons/ha and 72 tons/ha in Turkey and in EU.

The yields in the control area are for the main crops (maize and wheat) far below the yields in the project area. This is without any doubt due to the small scale and fragmented production in the control area, where the farms in the control survey only possessed around 1 hectare distributed between 2-4 parcels.

Table 6.7: Use of labour per farm before and after the LCP, man-years

Category of labour	*Before*	*After*
Your own family	1.90	1.80
Rented labour	1.15	1.07
Labour provided through collective-work	0.45	0.39

Source: Survey, N = 64

The increased yield per hectare has been achieved with a reduced average labour input. The use of labour per farm has in total fallen from 3.5 man-years to 3.25 man-years equal to a reduction of 7 %.

The yield per hectare per man-year has increased from 2.26 tons (average crop) in 2009 to 2.8 tons in 2013. This is an increase in labour productivity of 24%.

6.3.5. Increase in value of production

The most important overall objective for the LCP was to contribute to economic growth and increased income for the farmers in the project area. The farmer survey shows that this objective to some extent has been successfully accomplished.

The farmers increase the value of production with 30.2% from the last year before the LCP (2009) and to the first year after the LCP (2013). This is an average increase in value of production of 7.5% per year. Inflation has taken the biggest share of this with the average of 7.2% per year, but still the real growth has been positive with 0.3% per year.

This is not much, but must be assessed in the light of the overall economic development of the agricultural sector in Turkey and in EU. As it was demonstrated previously in this report, see table 5.2, the real growth in the value

of production of Turkish agriculture and agriculture in EU was -0.8% and -0.4% respectively from 2010 to 2014. The farmers in the LCP area have performed better than the agricultural sector in Turkey and in EU, even though the low level of real growth in itself may be disappointing.

6.3.6. Farmers investments

Reduced land fragmentation and increased scale of farms lead to increased investments in agriculture. This is well documented. It is therefore also anticipated in this evaluation that farmers have invested in their production the first year after the finalization of the LCP. The table below illustrates the investment level of the respondents in the farmer survey.

Table 6.8: Level of investment of farmers first year after LCP, TL

Investment range	*Number of farmers*	*%*	*Investment, TL*
0 - 5,000 TL	11	16.4	27,500
5,001-10,000 TL	6	8.9	45,000
10,001 – 25,000 TL	7	10.4	122,500
25,001 – 50,000 TL	6	8.9	225,000
50,001 – 100,000 TL	16	23.9	1,200,000
100,001 – 200,000 TL	14	20.9	2,100,000
More than 200,000 TL	7	10.4	1,400,000
Total	67	100	5,120,000

Source: Survey, N = 67, Exchange rate September 2013: 100 TL = 49.2 €

The sample of farmers, 67 in total in the two villages, were asked how much they invested by indicating the most appropriate range. The average for each range (for example 2,500 TL in the first and lowest range from 0 to 5,000 TL) is used to estimate the volume of investment range by range and in total. The estimation shows that the 67 farmers in the survey have invested 5.1 million TR the first year after the finalization of the LCP. It is 76,500 TR in average per farmer. If all active farmers have followed the same investment pattern, the total investment level of the farmers in the two villages is then estimated to be 14 million TL, and with the accepted statistical uncertainty of +/- 10%, the estimated total level of investment is between 12.6 million TL and 15.4 million TL.

Compared to the level of investments in the control area, the difference is significant. The survey of farmers in the control area shows, that the investment level per farmer in that area is 44,500 TL in 2013/2014, and as stressed before, there has been no LCP implemented in the control area. 70% of the farmers interviewed express need for a LCP in their area. Since LC is the only main difference between the two areas, the LCP has contributed to an investment level that is 1.7 times higher. A share of these investments would probably have been accomplished also without the LCP, and this will be assessed later in the section of deadweight below.

Table 6.9: How positive have your investments following the LCP affected the subjects listed below? Number of farmers

Impact categories	*To a large extent*	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Farm's turnover?	37	18	9	3	0
Farm's income?	37	20	9	1	0
Yield per area unit?	36	15	13	0	3
Labour productivity?	49	12	5	0	1
Working conditions on farm?	50	8	7	1	1
Environmental impact in relation to air and water pollution from farming?	24	11	17	6	9
Environmental impact in relation to protection of nature areas against farming?	24	16	15	6	6
Product quality?	47	11	2	4	3

Source: Survey, N = 67

According to table 6.9 the working conditions on the farm have improved considerable as a consequence of the LCP. 75% of the farmers find that this is the case to a large extent. Only 12 % find that this is not the case. This increase in working conditions has been achieved together with a big increase in labour productivity, also demonstrated above. 87 % of farmers find that the LCP has contributed to labour productivity. Further more the farmers find that labour productivity is the most important factor contributing to increase in the income of their farms. 55% of the increase in farm turnover is due to increased productivity while 45% is due to increased product quality. Water access for irrigation is a key reason for these impacts. The positive impacts on farms income and turnover are confirmed by 82% of the farmers.

The positive impacts in terms of environmental protection and nature conservation effects are assessed by the farmers to be relatively low, but still around 50 % of farmers find that there are positive effects on environment and nature due to the LCP, see also the section below on environmental sustainability.

6.4. Efficiency

The evaluation question of efficiency relates to the value of the benefits (results and impacts) compared with the resources used to generate them. It is a question of value for money.

Not all results and impacts can be directly measured against the investment in the LCP, but for some of them it is possible, in particularly for the output related benefits. The efficiency of some selected outputs and results are summarized below, where the full LCP investment of 1.7 million TL is used as investment figure for all benefits.

It is obvious that not all of the 1.7 million TR contribute to all outputs and results, but since a detailed budget and account system has not been available for this evaluation, it is anticipated that the 1.7 million TR contributes to all benefits.

Fragmentation

The LCP investment of 1,7 million TL has generated an increase of the average parcel size from 2.38 ha to 3.87 ha. This is an increase of 52 %. 1 million TL in LCP investment contributes here in this project with an increased parcel size of 31%.

The number of parcels has been reduced from 2,531 to 1,559, which is a reduction of 38% for the price of 1.7 million TL. Thus the efficiency is a reduction in fragmentation (number of parcels) of 23% for 1 million TL in this particular project.

At the same time, the reduced fragmentation and the re-parcelling also contributes to more optimal shape of the parcels. The number of parcels with optimal parcel shape (squared and rectangular parcels) has increased with 42% because of the LCP. Thus the efficiency of the parcel shape component is 25% increase in optimal parcel shape per 1 million TR invested.

Roads and irrigation channels

The LCP has constructed new roads and irrigation system. 45.700 meters of roads have been constructed per 1 million TL, and the farmers cost to farm work and transportation is reduced due to the new roads and the improved parcel shape. The costs are reduced with 400,000 TL or 240,000 TL per 1 million TL invested equal to a reduction in costs of 7.8% per 1 million TR invested.

Regarding the irrigation channels, the LCP has constructed 24,300 meters of irrigation system for 1 million TL. This has contributed to increased water irrigation efficiency and lower irrigation costs per area.

Investment behaviour

Reduced fragmentation, leads to higher investments, which again leads to higher productivity, better product quality and higher income for the farmers. This is also the case in this project. The LCP represents an investment of 1.7 million TR, and this investment generates then subsequently 14 million TR in investment by the farmers. 1 million LCP investments generate 8.2 million in private farmer investments. A share of these investments, would also take place without the LCP (see the section on dead weight below), and if this is taken into consideration, the LCP generated investment is around 5 million TL per 1 million TL in LCP investment.

Efficiency summary
1 million TR in LCP investment generates:

- Increased parcel size of 31%
- Reduced fragmentation (number of parcels) of 23%
- Increased number of optimal shaped parcels with 25%
- 45.700 meters of rural roads constructed
- Reduced farm work and transportation costs with 7.8%
- 24,300 meters of irrigation system
- 8.2 million TL in private farmer investments in total
- 5 million TL in private farmer investments due to the LCP

6.5. Sustainability (economic, environmental and social):

To what extent are the effects of the project lasting also after the closure of the project? And *to what extent will new LC project activities (public – mandatory vs. private - voluntary) be needed?*

6.5.1. Economic sustainability

Project results and impacts are lasting, and the economic sustainability is as such assessed to be high, but the importance of the LC project will tend to erode over time, and a new pressure for an increased scale of production will occur. Thus, a new LCP may be expected in the future, maybe after 20 or 30 years, in order to reduce fragmentation further and maybe also to contribute to increased scale of production through mergers of parcels and farms, for example through the implementation of other policy measures, such as support to early retirement of elderly farmers and support to young farmers under 40 years to establish as farmers. These support measures are typical measures under the EU CAP, pillar 2 for rural development and have been used over any years in the EU member states in order to support restructuring and modernization of agriculture.

6.5.2. Environmental sustainability

Although no explicit environmental assessment has been accomplished as a part of the evaluation, it is still the observation of the evaluation team that negative environmental effects still will be a problem in the project area even though the irrigation efficiency has increased (use of water per area and yield), but the use of ground water for irrigation has also increased in absolute figures. Thus, the pressure on the ground water continues, and the risk for environmental negative effects, such as more so-called “sink holes”, may increase.

Larger fields will also, all other things being equal, mean reduced biodiversity, and it is important that reduction of wind-breakers etc. is compensated for through mandatory replanting of wind belts etc. in order to make the biodiversity intact and to avoid soil erosion. Planting trees for recreational purposes can also contribute reduce the negative impact on biodiversity.

6.5.3. Social sustainability

It is an open question, to what extent the LCP has contributed to lasting effects in terms of social sustainability in the sense that for example migration is stopped, but the increased attractiveness of using the land (reduced fragmentation, road and water access) has made it more feasible for landowners to re-start as farmers, and this has to some extent happened. The most important factor in this respect is however that the income of the farmers in the area has increased more than in the country in general due to the investments generated by the LCP.

6.6. Deadweight and leverage effects

As inferred previously in the report, dead weight is a negative outcome of the project, and is related to this evaluation question: *To what extent would the farmers have made the same investments also without the LC project?* Leverage is on the contrary positive and refers to the additional economic activates generated (lifted) by the LCP. The relevant evaluation question is *to what extent the LCP has contributed to higher investments of farmers than otherwise would have been accomplished?*

Regarding deadweight, the farmers have been asked to what extent they would have invested also without the LCP. The replies are summarized below.

Table 6.10: Share of investment, which also would have been accomplished without LCP, TR

Range of investment also accomplished	*Number of farmers*	*%*	*Investment, TL*
(1) None of them	26	38.8	0
(2) 1-25 %	10	14.9	286,567
(3) 26-50 %	15	22.4	429,851
(4) 51-75 %	2	2.9	57,313
(5) 76-99 %	0	0	0
(6) All of them, even so	11	16.4	840,597
(7) I don't know	3	4.8	0
Total	67	100	1,614,328
Share of accomplished investment, %			32

Source: Survey, N = 67, Exchange rate September 2013: 100 TL = 49.2 €

According to the survey results, 36.6 % of the farmers would have invested 1.6 million TL also without the LCP. If this estimation is representative for the full population of farmers (+/- 10%) the total investment also without LCP would have been in the range from 4 million TL to 4.8 million TL with an estimated average level of 4.4 million TL.

The estimation shows that only 32 % of the total investment would have been accomplished without the LCP, while 68 % are depending on the LCP and be

linked directly to the project. Without the project, these investments of 8.6 to 10.5 million TL would not have been accomplished. Thus, the LCP with the investment of 1.7 million TL contributes significantly to stimulate development of agriculture and to economic growth in the project area and beyond in the region and economy. The increase in investment activity generated by the LCP is minimum 5 million TL in private investments of the farmers per 1 million TL in LCP investment.

Compared with the farmers in the control area, the investments also without the LCP seem to be underestimated by the farmers in the LCP area. The average investment in the control area without land consolidation was 45,500 TL per farmer in 2013/2014, while the average here in the LCP area also without LC would have been 25,000 TL or only around 50% of the investment level in the control area. The conclusion is that there might be a tendency among the farmers in the LCP area to overestimate, how depending they are on the LCP. However, this does not change the overall picture. A considerable additional investment is generated by the LCP.

The dependency of the LCP is also assessed with the help of the following question presented in table 6.11.

Table 6.11: If the LCP had *not* been implemented, to what extend would you have participated in similar land swapping, purchase/sell transactions on your own initiative?

	To a large extent	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Land swapping	21	13	10	21	2
Land purchase/sell	29	9	8	19	2

Source: Survey, N = 67

It seems from the replies that there are some variations among the farmers in their perception of to what extent they would have participated in land transaction activities without the LCP. 51% would most likely have joined land swapping, while 57% most likely would have been involved in purchasing or selling of land. However, 46% would not do any land swapping and 40% would not do any buying/selling. It is difficult to make a clear conclusion here, but the tendency in the material points in the direction that there are some dependency on the LCP and that it has contributed to more transactions than would have been the case, if it was not implemented. The LCP makes a difference in this respect.

What about the future, now that the current LCP is finalised? The farmers are eager to continue the re-parcelling process, either through land swapping or through buying and selling of land. According to table 6.12 below, 66% will most likely participate in land swapping within five years from now, and the same percentage (66%) will participate in trade with land. However, the trade of land seems in general to be less attractive than the land swapping, and one reason is

articulated by the farmers again and again: The higher prices of land after the land consolidation project. It is clear that the land now represents a higher value than before, due to the improved parcel pattern, the reduced fragmentation, water and road access etc., and a factor 5 in the price per hectare has been mentioned to the FAO team. This will of course be prohibitive for market driven land transactions and be restrictive for further development in the area, since many farmers claim they cannot or only difficultly can afford to buy more land.

Table 6.12: To what extent is it likely that you will participate in other new land swapping, purchase/sell actions within 5 years after the LCP has been finished?

Scale	*To a large extent*	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Land swapping, number of farmers	41	3	8	11	3
Land purchase/sell, number of farmers	36	8	8	14	1

Source: Survey, N = 67

7. Evaluation of the LC process and project administration

7.1. The land consolidation approach and process

Land consolidation in Turkey is mainly regulated by two main laws; Law on Soil Conservation and land use (law no. 5403) and Law on Agricultural Reform and Implementation Instructions for Land Arrangements in Irrigation Land. (law no. 3083). In 2015, GDAR issued a manual to guide and streamline the implementation of land consolidation projects, step by step.

The land consolidation approach is comprehensive and compulsory. The LC project (re-allotment plan) is implemented when 2/3 of the landowners in the project area, representing more than 50% of the land, agree with the plan. Thus, a minority of the landowners can be included in a project, which they wish not to be part of. The participating landowners receive land of the same value as they enter the project with, but in fewer consolidated parcels with better shape. Sales and purchase transactions are usually not encouraged and facilitated in the re-allotment process.

The land consolidation programme and the individual projects are managed by GDAR in cooperation with other relevant institutions at the state level such as the State Hydrological Works (DSI), the State road and railway authorities (TCK and DDY), the General Directorate of Land Registry and Cadastre as well as public institutions and agencies at the provincial and local level. The projects are in the field implemented by private geodetic companies selected after a tender process and supervised by a project control engineer from the provincial department of MoFAL/GDAR.

The project areas are large and usually cover 5,000 – 30,000 ha, some even larger. The re-allotment planning is integrated with public investments in agricultural infrastructure in the project area. Usually, new rural and field roads are constructed and irrigation systems installed or improved.

At the initial stage of the projects, the contractor, together with the provincial team from GDAR, organizes a meeting with the relevant public authorities. First, a Social Structure Survey Report is prepared by the contractor to identify the needs of the project community including needs for improved agricultural infrastructure such as field roads, irrigation, etc. Second, village information meetings are held in the involved villages where the local farmers and other stakeholders are informed about the background for the project, possible benefits for the participants, their legal rights and planned investments in agricultural infrastructure. Commissions and contact groups are in each project established to supervise on land valuation, re-allotment planning, design of road network etc. All costs related to the projects are covered 100% from the state budget.

Land valuation (soil grading) is conducted in the project based mainly on soil quality but also taking into consideration other factors such as size and shape of parcels, location (distance to village). A land valuation map is prepared and

made public in the village for 15 days where the landowners can object against the valuation. After the objections are considered, the land valuation map is finalized.

The draft re-allotment plan is prepared around the skeleton of the planned infrastructure works (e.g. roads and irrigation but usually also ecological corridors). First, sub-areas usually defined by natural boundaries, are formed. In the re-allotment planning, the aim is to consolidate the land of each participant around the largest parcel but also taking into consideration individual wishes of the landowners revealed during interviews with the participants. All new parcels shall be given a rectangular shape where possible and shall have access to road and irrigation if this is part of the project. The draft re-allotment plan is made public in the village for 15 days where the landowners can object. Then the plan is revised and published again. The re-allotment plan is revised up to three times if objections are received and is then final. The new landownership is registered in the land registry and cadastre, construction work implemented in the field and the project finalized.

7.2. Farmer satisfaction

The farmers satisfaction with the LCP is outspoken. 84% are to a large extent satisfied with the LCP. Only 9% are either not al all satisfied or not too much satisfied. The conclusion is clear on this: The LCP in Konya Cumra has been accomplished to the big satisfaction of the farmers involved in the project, see table 7.1 below.

Table 7.1: Do you find that the overall LCP is satisfactory?

	To a large extent	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Overall satisfaction	56	5	3	3	0

Source: Survey, N = 67

The satisfaction is also high regarding the individual actors in the project, except from the involved consultants and facilitators. Here 45 out of 67 farmers do not know what to say about this question. It is strange, since the consultants and facilitators should be well known by the farmers, for example through the workshops and bilateral meetings held during the process.

Beside of this observation, there are no big surprises in the material. The highest scoring stakeholders are the water associations, while the MoFAL and GDAR is the lowest, beside the consultants and facilitators.

Table 7.2: How satisfied are you with the involvement of the following actors in the administration and implementation of the LCP?

Actors	*To a large extent*	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Ministry of Agriculture, GDAR	29	6	4	8	20
The Regional office of GDAR	36	9	6	8	8
Irrigation cooperatives	40	14	5	6	2
The local village administration	35	13	4	10	5
The consultants and facilitators	7	4	2	9	45
The contractor firm	31	12	7	11	6

Source: Survey, N = 67

The final question included in this report is the following related to the satisfaction of the farmers for the individual steps in the land consolidation process.

Table 7.3: How satisfied are you with the services provided in the project?

Topic	*To a large extent*	*To a limited extent*	*Not too much*	*Not at all*	*I don't know*
Soil grading result for your parcels (land valuation)	37	10	2	9	4
Draft re-allotment plan	46	4	3	7	2
Final re-allotment plan	52	3	6	6	0
Fair re-allotment process	41	12	7	7	0
The actions taken after your suggestions and wishes	42	10	4	9	2
The requirements to you as a participant to the project	53	4	4	4	0
The length of the time of project implementation	48	13	4	2	0
The coherence of the project implementation with the timing of the agricultural activities	43	17	3	4	0

Source: Survey, N = 67

Again we see in general positive replies. The satisfaction with all steps is high, although a few farmers between 10 and 15% are either not at all satisfied or not too much satisfied. Thus, there is still some work to do in order to increase the level of satisfaction even higher. This can in particularly be the case for the soil grading, where only 55% are satisfied to a large extent and 45% are more critical.

8. Conclusions and recommendations

8.1. Conclusions

The conclusions of the evaluation are summarized below. The first section presents the conclusions related to the effectiveness and the efficiency of the LCP, while the second section relates to the land consolidation procedures and farmers' satisfaction with these procedures.

8.1.1. Effectiveness and efficiency

Output

Fragmentation
Reduced fragmentation was an important objective of the project. The objective has been fulfilled. The number of parcels is reduced with 38 % from 2,531 to 1,559, and the average size per parcel is increased from 2.38 ha to 3.87 ha equal to an increase of 1.5 ha or 63 %. Furthermore, the surveyed farmers have reduced their number of parcels from in average 7.1 parcels before the LCP to 2.7 parcels after the LCP. This is a reduction of 61 % and thus far more than the average for the project area (38%).

Rural roads
The objective is fulfilled. 100 % of the parcels have now access to roads, against 63% before the LCP. In order to make this happen, the project has invested in new rural roads leading to an increase in the road network from 115,084 meters of roads to 193,729 meters of roads, equal to an increase of 68 %.

Irrigation and access to water
The objective is fulfilled, since 100 % of the parcels now have access to the water system for irrigation purposes. In order to ensure this, the water system is enhanced and increased from 111,023 meters to 152,880 meters, an increase of 38 %.

Financial effectiveness
The project is operationally accomplished mostly within the planned implementation period, which is satisfactory. The budget was 1.9 million TL and the account shows expenditures of 1.7 million TL. The budget was respected, and only 91 % of the resources were utilized to fulfil the technical objectives 100%.

Results and impacts

Parcel shape and related costs
The pattern of the parcels has been improved. The number of squared and rectangular parcels has increased from 789 of the parcels to 1,121 (42% increase), while the number of amorphous parcels went down from 862 parcels to 173 equal to a reduction of 80%. The costs related to ploughing and transport

as well as to labour employed with these tasks are reduced from 3 million TL before the LCP to 2.6 million TL after the project. This is a reduction of 11%.

Water
The documented shift in irrigation principles/technologies from surface flooding to sprinklers, drip irrigation and automobile irrigation robots leads to increased effectiveness of water use. The method of irrigation was predominantly based on surface flooding for a limited area before the LCP, and has afterwards been changed to the pressurized types of irrigation for the whole area. The water consumption has increased with 28%, but the water use per hectare has also been reduced to 28% of the usage before the project. Increased irrigation effectiveness has increased yield and provided better product qualities as a consequence.

Land use
The LCP has contributed to an increase in hectares under crops. In total, the increase is 135 ha equal to 10%. In particularly the area with corn and sugar beet has increased, while a few crops has been reduced (sunflower and potato). The development and the change among the crops is to a large extent market and price driven, but the overall increase in the production of crops (number of hectares) must be considered a positive result of the LCP itself.

Productivity
Except for barley, all crops demonstrate an increase in yield per hectare from the year before the LCP compared to the year after the LCP in the range from 11% to 25 %. The yields of wheat (5.1 tons/ha) and sunflower (3 tons/ha) in the project area are both better than the Turkish 5 year average of 2.6 tons/ha and 2.3 tons ha respectively. Maize yield is almost on line with the Turkish average, and 11% higher than in EU.

The yield per hectare per man-year has increased from 2.26 tons (average crop) in 2009 to 2.8 tons in 2013. This is an increase in labour productivity of 24%.

Value of production
The farmers have increased the value of production with 30.2% from the last year before the LCP (2009) and to the first year after the LCP (2013). This is an average increase in value of production of 7.5% per year. Inflation has taken 7.2% per year, but still the real growth has been positive with 0.3% per year, while the real growth in the value of production of Turkish agriculture and agriculture in EU was -0.8% and -0,4% respectively from 2010 to 2014.

Investments of farmers
The evaluation shows that the 67 farmers participating in the survey have invested 5.1 million TR the first year after the finalization of the LCP. It is 76,500 TR in average per farmer. If all active farmers have followed the same investment pattern, the total investment level of the farmers in the two villages is then estimated to be 14 million TL.

Efficiency

In summary it can be concluded that 1 million TR in the LCP investment generates:

- Increased parcel size of 31%
- Reduced fragmentation (number of parcels) of 23%
- Increased number of optimal shaped parcels with 25%
- 45.700 meters of rural roads constructed
- Reduced farm work and transportation costs with 7.8%
- 24,300 meters of irrigation system
- 8.2 million TL in private farmer investments in total
- 5 million TL in private farmer investments due to the LCP

Would the farmers have participated in re-parcelling activities on their own?

There are some variations among the farmers in their perception of to what extent they would have participated in land transaction activities also without the LCP. 51% would most likely have joined land swapping, while 57% most likely would have been involved in purchasing or selling of land. However, 46% would not do any land swapping and 40% would not do any buying/selling.

8.1.2. LC project administration and farmers satisfaction

Procedures and administration

The land consolidation approach is comprehensive and compulsory. The LC project (re-allotment plan) is implemented when 2/3 of the landowners in the project area, representing more than 50% of the land, agree with the plan. The projects are implemented by private geodetic companies selected after a tender process and supervised by a project control engineer from the provincial department of MoFAL/GDAR.

Farmers' satisfaction

The farmers' satisfaction with the LCP is outspoken. 84% of the interviewed farmers are to a large extent satisfied with the LCP. Only 9% are either not al all satisfied or not too much satisfied. The conclusion is clear: The LCP in Konya Cumra has been accomplished to big satisfaction of the farmers involved in the project.

The satisfaction among the farmers is also high regarding the various steps included in the land consolidation procedures, although a smaller group of farmers between 10% and 15% either are not at all satisfied or not too much satisfied. Thus, there is still some work to do in order to increase the level of satisfaction even higher, in particularly for the soil grading / land valuation, where 45% of the farmers are critical to some extent.

8.2. Recommendations

Based on the outcome of the conducted pilot evaluation of the Konya Cumra LC project and the description and analysis in section 7.1 of the current land consolidation approach and procedures, the following recommendations for improvement of the land consolidation procedures are provided to MoFAL/ GDAR for consideration:

8.2.1. Elect a committee of local stakeholders to represent the general interests of the local stakeholders in the land consolidation process

Most European countries with on-going land consolidation programmes involve a committee of local stakeholders (landowners and farmers) elected directly by the beneficiaries to represent their interests against the land consolidation agency, contractor and other project professionals. This will strengthen the active involvement and participation of the local stakeholders.

8.2.2. Review and improve the land valuation process

The pilot evaluation in Konya Cumra has revealed that the participants were least satisfied with the land valuation part of the process (section 7.2). An active involvement of the committee of local stakeholders recommended above will most certainly strengthen the land valuation process and generate more satisfaction with the outcome, if the valuation principles are made transparent and understandable for the farmers.

8.2.3. Encourage and facilitate sales – purchase agreements as an integrated part of the land consolidation process

Today, the participating landowners in the re-allotment process receive land of the same value as they enter the project with, but distributed in fewer and consolidated parcels of better pattern. Sales – purchase agreements are not facilitated in the current process, but left for private initiatives between the landowners. Usually, a significant part of the landowners in the project areas are not farming their land, e.g. because they are retired or have moved from the village. They may consider selling their land parcels in the process, if appropriately facilitated by the implementing project team. Thus, the potential to use the land consolidation project not only to reduce land fragmentation but also to increase holding and farm sizes are not utilized. This would most certainly result in increased economic benefits for the farmers from the project.

8.2.4. Introduce a State Land Bank to support land consolidation projects

The law on the protection of soil and use of Land (law no. 5403) and the Turkish Civil Code (law no. 4721) were amended by the Turkish Parliament in May 2014. The amendments were designed to prevent agricultural land from being further subdivided and to establish a minimum size requirement. In cases where the families cannot agree or afford to assign the entire plot to one heir or agree to register the plots under a family property partnership, it would be obvious to sell

the agricultural land to a State Land Bank for temporary ownership until the land was sold again, e.g. as part of a land consolidation process. This would increase the land mobility in the LC projects and make land available for other farmers to purchase and hence increase their holding and farm size (also see recommendation 3). Considerations regarding establishing a land banking system are already on-going in GDAR.

8.2.5. Invest more in capacity development of staff involved in implementation of land consolidation projects

Turkey has rapidly scaled up its land consolidation programme since 2009 and the aim is currently to consolidate 1 million ha per year. However, there are still a limited number of private companies (contractors) and a limited number of professionals in the relevant institutions with long lasting experience in land consolidation. It is recommended to build up capacity both in the public and private sector to ensure that the quality of the work is sustained. It could also be considered to introduce a license system for land consolidation work, where the license it issued after passing adequate training and test. Increased capacities of staff may also increase the satisfaction of farmers with the facilitators and consultants representing the contractors in the projects.

8.2.6. Introduce systematic ex ante environmental impact assessments of land consolidation projects

It is strongly recommended to introduce systematic environmental impact assessment (EIA) of planned land consolidation projects, before they are implemented, or Strategic Environmental Assessments (SEA) of bigger projects for example involving major infra structure investments such as high ways and similar. This will ensure that projects (ceteris paribus) will not have unforeseen negative impact on nature and environment.

8.2.7. Establish a comprehensive baseline description of the project area before implementing the LCP.

The baseline description should provide information about the state of play for all relevant indicators in the project area. The indicators must be related to the objectives of the LCP, such as water use and efficiency, technological levels (types of technologies applied), yields of plant and animal production, labour input, transportation costs, turnover (value of production), cost structure of production and income form production and similar. The baseline information will be used as reference to measure the changes after the implementation of the LCP. Without a baseline, as in this pilot evaluation, the establishment of a baseline is difficult and may be problematic due to farmers lack of book keeping and accounting systems and thus lack of evidence of the situation in the year before the implementation of the LCP.

8.2.8. Conduct more pilot evaluations of land consolidation projects and prepare for future programme evaluation

It is recommended to conduct more pilot evaluations of land consolidation project (e.g. 3-5 projects) implemented since 2009 in order to evaluate impact of projects in areas with different farm structures than in the evaluated project in Konya Cumra, e.g. in areas where livestock is important and in areas with less potential for agricultural production than in the Konya region. The methodology developed for the first pilot evaluation can be the basis. A third step could be to prepare for the larger evaluation of the complete land consolidation programme. In future project evaluations, it is recommended to include evaluation also of the impact of the LC projects on nature and environment, which was not possible in the first pilot evaluation with the time and resources available.

8.2.9. Let environmental impact assessments be an integral part of the ex post evaluation of land consolidation projects and of the programme

It is recommended to conduct an EIA as an integrated part of future ex post evaluations of land consolidation projects and of the programme in its whole. The objective will be to include also a systematic assessment of impact on nature and environment from the land consolidation projects as well as from the complete programme in the future monitoring and evaluation framework.