LOCAL MARKET DEVELOPMENT PROJECT

KYRGYZSTAN / TAJIKISTAN

Impact study

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HELVETAS Swiss Intercooperation | KYRGYZSTAN

ICCO actalliance | Kerk in Actie actalliance

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Abbreviations

DB	Database
FFS	Farmer Field School
GDP	Gross Domestic Product
ICCO	Interchurch Organisation for Development Cooperation
ILO	International Labor Organization
IPM	Integrated Production Management
KG	Kyrgyzstan
KGS	Kyrgyz Som
LMD	Local Market Development
NGO	Non Governmental Organization
PE	Processing Entreprise
SDC	Swiss Development Coopration
TJ	Tajikistan
UN	United Nations
VC	Value Chain
VCI	Value Chain Influencer
VCO	Value Chain Operator
VCS	Value Chain Supporter

Acknowledgments

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Raphael Dischl, March 2012

Executive Summary

The LMD project, funded by ICCO and Helvetas Swiss Intercooperation started in Kyrgyzstan in 2005 and in Tajikistan in 2007, being currently in its second phase (2008 – 2012). The main intervention approach is to link existing fruit and vegetable processing and trading companies upstream to farmer groups in order to enable these latter to deliver produce in bulk, and to connect the processors down-stream to markets. Through this the main target groups – subsistence farmers with small market surplus production, as well as small market oriented farmers – shall be able to increase their income.

The objective of this impact study was to provide evidence on the target group profile of the project, analyze the income generated through the project at farm level, compare income levels of men and women, different age groups and regions, evaluate the impact of the project on farming systems as well as the national vegetable and fruit production sector, and assess the structure and functionality of the project database. Comprehensive analysis of data of the project database, established in 2008 for both countries, constituted the main basis of the findings hereafter.

The following main **conclusions** were made:

- The LMD project has a continued focus on poor and absolute poor farmers, although their share decreased in the last years. There is a trend of VCS working preferably with larger farmers in Kyrgyzstan, partly due to a new volume-based payment scheme. This trend needs to be observed carefully and measures taken to correct it.
- The project contributes significantly and increasingly to income generation in both countries, including a total of 5354 farmers in 2011 with average incomes of 1'139 US$ per year in Kyrgyzstan and 2'058 US$ in Tajikistan.
- Male and female beneficiaries in both countries achieve equal income levels. However, there are significant imbalances in the share of women beneficiaries in Tajikistan (28-35%) and between the regions in both countries.
- The attractive income opportunities of local market oriented vegetable and fruit production constitute potential incentives against labor migration, especially for young people who proved to be most successful in LMD activities.
- The impact of the project on food security is ambivalent. On the one hand, it is assumed that farmers are able to buy sufficient staple crops due to the high profitability of vegetable and fruit production (grown on a part of their land). On the other hand, these production systems increase economic and climatic risks. The project should compile more data on this matter to make clear conclusions and react where required.
- The project introduced IPM standards at a broad scale (77% of LMD farmers in 2011), reducing agro-chemical inputs and production costs considerably, and increasing yields by 30 to 50 %.
- Efficient contract and service provision systems between farmers, VCS and PE were established. The new volume-based payment scheme for service providers increased the return on investment (income generated per 1 $) to a ratio of 1 : 33.6 in 2011.
- Comprehensive information and experience was collected by means of the project database, constituting a valuable future resource for project partners to independently provide services to VC clients.

Five main directions for the next project phase were identified:

- **Fill gaps in the VC system**: The project should phase out the broad outreach to new farmers, try to bring in traders as complementary actors in the value chain to explore additional market opportunities and to broaden the range of products, promote further service functions of PE, strengthen efforts towards sector coordination and systemic government support.
- **Improve efficiency and orientation of service provision**: Further mechanisms are needed to strengthen the financial and institutional autonomy of VCS. Options for complementary funding mechanisms from the government or associations should be explored, especially oriented towards

more disadvantaged farmers. Additional incentives must be developed for VCS to include more small farmers. Project funding for outreach to larger farmers should be phased out.

- **Enhance focus on migration**: The LMD project has the potential to mitigate or even reverse emigration trends of young, successful people from rural areas. In the new phase, the project should put special emphasis on including young people in LMD activities, identifying regions with high labor migration rates. Also, local market oriented vegetable and fruit production may be a strategy to tackle labor migration in regions where the LMD project has not been active so far.
- **Enhance focus on ecologically sound production**: IPM farmers still depend on certain amounts of costly chemical inputs with harmful effects on soils and ecosystems. In the next phase, the project should promote organic farming practices as a promising option for LMD farmers. Organic production can be particularly profitable in vegetable production where small surfaces are required, even if the product is sold without certification and at an only marginally higher price.
- **Promote demand-oriented development and use of LMD database**: The comprehensive LMD database should be handed over to committed local partners who manage and use it with a commercial aim, developing tailor-made services to VC clients. Furthermore, services to other projects, partners and donors should be offered to share results, experiences and lessons learned of the LMD database. One possibility are systematic exchanges through capacity buildings, workshops and online platforms, another is the comprehensive compilation of practices, methods and lessons learned of the LMD data management in written documents such as guidebooks or training tools.

1. Introduction

1.1. Overview on LMD project

The LMD project started in 2005 with a pilot-phase based on the former „Support to Private Initiatives Project“ of Helvetas/SDC and a joint ICCO and Helvetas situation analysis in Southern Kyrgyzstan. In 2007 an extension to Tajikistan was piloted. The present second phase (2008 – 2012) covers both countries with offices and activities around Bishkek (Northern Kyrgyzstan), Osh (Southern Kyrgyzstan), Khujand (Northern Tajikistan) and Dushanbe (Southern Tajikistan). The project is funded by ICCO and Helvetas, contributing 65 % and 35 % of the funds (2011), respectively.

The main intervention approach is to link existing fruit and vegetable processing and trading companies upstream to farmer groups in order to enable them to deliver produce in bulk and to connect the processors down-stream to markets. Through this the main target groups – subsistence farmers with small market surplus production, as well as small market oriented farmers – shall be able to increase their income.

The **overall goal** of the current phase reads as follows:

> *Synergies between public, civil and private actors lead to systemic changes and improvements in selected agricultural sectors, and thus contribute to poverty reduction, and specifically to inclusion and improvement of the well-being of remote and marginalized rural population active in agricultural practices.*

The expected project **outcomes** are:

- Value Chain Operators develop and maintain trustful, reliable and transparent relationships.
- Value Chain Supporters develop and offer affordable and demanded high quality (financial and non-financial) services to VC operators.
- Value Chain Influencers are involved in creating a commercial and social friendly business environment.

The project is aimed at the following target group structure:

- 10 % of Subsistence Farmers with small market surplus (those who have usually a small surplus and lack of vision for farm business development but have an interest to be developed to the next stage);
- 60 % of Small Market Oriented Farmers with surplus (those who produce surplus but do not have a vision of their farm business development);
- 30 % of Fully Market Integrated Farmers (those who have the vision for their farm business development).

In Kyrgyzstan the LMD project is currently active in two regions in the north of the country: Issyk-Kul and Chu; and three regions in the south: Batken, Jalal-Abad and Osh.

In Tajikistan, the LMD projects covers Sughd region in the north of the country, and Khatlon region and Rayons of Republic Subordination in the south.

1.2. Working approaches of LMD project

The Local Market Development program works within the framework of the Helvetas Natural Resource Management (NRM) Strategy and the ICCO Fair Economic Development – FED (particularly Local Market Development). The program has proven the feasibility and the effectiveness of the following working approaches, and will therefore apply them during the second phase:

Sub-sector focus: The program works on the basic assumption that a sub sector focus, which offers concrete and sub sector needs-specific solutions, is best indicated for building the necessary trust and capacity to enter into commercial and long-lasting relationships between value chain actors.

Working along value chains: LMD involves and encourages all VC actors along the value chain in providing the services needed to overcome obstacles and to ensure that products are delivered to markets and that farmers receive in return a fair compensation for their produce and services. Value

chain as a concept to generate win-win-win solutions and to jointly-overcome obstacles is a driving force for improved economic development.

Facilitation: LMD sets up a supporting framework for program partners. For the program facilitation means a process consisting of several stages: situation–analysis, idea- generation; discussions and joint-assessments between diverse value chain actors; the joint elaboration of action plans; the transparent separation of and coordination of responsibilities of value chain actors; and finally, an inclusive, participatory monitoring and evaluation mechanisms with all involved partners. The project was managed by only 4,8 people in both countries during the analyzed period of time.

Reversing the flow of funds: in order to create service market-like situations, the LMD has introduced alternative financial models, such as mechanisms aiming to create competitive situations among VCS's, which at the same time empowers farmer beneficiaries, to select the service provider of their choice. A precondition for reversed funding is a minimal degree of institutionalization (formal farmer groups). The same model has been used for processing and trading companies - embedded services.

Customized technical support multi-stakeholders platforms, as support to social empowerment: The program shows opportunities and provides a space for exchange and learning to existing value chain supporters (NGOs, local extension services, service providers) and value chain influencers (state organizations and donor projects). Additionally, the program provides customized technical assistance if needed and demanded to VCS, VCI and VCOs for improved social empowerment.

Gender Sensitivity in work with small-scale agricultural producers: The program pays essential attention to the involvement of women in agricultural activities keeping in mind women's duties at home and children education.

Working with local service providers: the program relies on the provision of technical and organizational support to farmers groups through local service providers. In its role as facilitator, the program will not substitute any organizational deficiencies, but foster local capacities through capacity development, access to information, know-how and expertise.

Learning platform: LMD fosters dialogues and exchanges on lessons learnt and experiences based on project interventions as well as additional experiences generated by partners or other countries and regions. Project context

1.3. Socio-economic situation

The table below gives a brief overview on main socio-economic indicators of the two countries:

	Kyrgyzstan	**Tajikistan**
Population, million people (2011)	5,6	7,6
Rural population, % (2011)	65%	74%
GDP per capita, US$ (2010)	860	820
% of population earning < US$ 2.15 per day (2007)	21%	43%
Inflation rate, % (2011)	16,6%	12,5%
Human Development Index (2011)	126 (2007: 116)	127 (2007: 122)

Table 1: Socio-economic indicators, Kyrgyzstan and Tajikistan

1.4. Importance of agriculture

Kyrgyzstan

Agriculture, forestry and fishery are the most important economic sectors of Kyrgyzstan, employing over 33% of the population and contributing 23% to GDP in 2010. About 60% of the total value of agricultural production derives from the crop sector, the remaining 40% from the livestock sector. Of the total land area, 56.2% is classified as agricultural land and only 1'411 million ha or 7.3% as arable land, of which 1'072 million ha or three quarters of arable land are irrigated. Of the total agricultural land, 87% are pastures. The pressure on land has increased due to a decreasing total of arable land and a slight increase in the number of people working in agriculture.

The Kyrgyz agricultural system is marked by low levels of concentration and thus high levels of dispersion of activities and crops, with only wheat, potatoes and cattle being exceptions to a certain degree. Marketing of fresh and processed agricultural products is weakly organized, most farmers being small-scale producers with limited and inhomogeneous production that is neither suitable for export nor for processing in the country. On the one hand, there is a high demand of vegetables from processing companies and fresh markets, on the other hand most farmers lack information on the required types and quality of products. At the same time, fresh product imports from China and other neighboring countries are increasingly dominating the domestic market.

Tajikistan

Agriculture accounts for 22 % of Tajikistan's GDP and employs two thirds of its labor force. The country has 738'000 ha of agricultural land, 68 percent of which are irrigated. Cotton is the dominant cash crop, accounting for almost 30 percent of the country's export earnings. Although the Tajik Government issued a decree # 111 (from 5.03.2007) on the freedom for farmers to choose a crop for production in 2007, still almost three quarters of Tajikistan's farmland and a similar share of farm households are dedicated to growing cotton. Only slowly, crops like wheat, vegetables and edible oils increase their share. Most people in both cotton and non-cotton areas perceive that land was distributed unfairly. Progress in reforming non-cotton land has proceeded somewhat faster than for cotton land, partly because subsistence crops attract fewer vested interests than cash-generating cotton. The reform of state farms in non-cotton areas is mostly complete, at least in theory, with individual farmers receiving land use right certificates.

Tajik agriculture is not in good shape by regional standards, despite the improvement made in the past several years. It is characterized by low mechanization, limited land resources and dependency on water. Despite recent growth, the production of several important crops in Tajikistan, including cotton, has not reached pre-transition levels.

With regard to the export of fresh and processed agricultural products Tajikistan faces several difficulties. The political relationship with Uzbekistan is delicate and geographically, Tajikistan is located too far from potential Russian and Kazakh markets. Furthermore, local markets are dominated by imported food products, and there is a lack of domestic producers of well-packed and affordable products, as well as specialized trading companies who sell fresh and processed products on the local and export market.

1.5. Purpose and objectives of impact assessment

The LMD project stands out by extensive reporting and a good availability of information. Apart from regular reporting, two mid-term reviews and two evaluations were conducted. An impact survey conducted in 2008 provided limited information due to the lack of a baseline and control group, as well as a significant attribution gap.

With the aim to provide feedback to farmers, project partners and donors, to offer tailor-made services to farmers, processing and trading companies, agricultural input suppliers and credit institutions, and to take necessary adaptive measures in the design of the project, an extensive database was established from 2008 onward. The database includes all project clients (farmers) in Kyrgyzstan and Tajikistan since 2008, and consists of almost 50 criteria. In 2011, an ex-post control group was surveyed in order to compare the income situation of LMP farmers and farmers who were not beneficiaries of the project.

Based on the information of the database and existing project documentation, this impact study has the following **objectives**:

- Provide evidence on the target group profile the project is working with.
- Provide information on income generated through the project at farm level, comparing income levels of men and women, different age groups and regions.
- Provide information on the impact of the project on farming systems, with a special eye on IPM production.
- Show the impact of the project on the national vegetable production and processing sector.
- Assess the structure and functionality of the project database.

2. Methodology

2.1. Proceeding for Impact Analysis

The impact analysis included the following steps:

- Analysis of existing project documentation and previous reviews;
- Quantitative analysis of the farmer database 2008 – 2010 (without control group) and the farmer database 2011 (including control group);
- Triangulation and plausibility tests: The figures of the database and the results of the data analysis were compared with project monitoring data and farmer profile sheets;
- Qualitative analysis of the sector development through discussion with the project team and project implementation partners;
- Validation of results with project partners during a learning workshop.

2.2. Limitations for the Data Analysis

The extensive Access project database allowed for a detailed analysis, providing a sound basis for findings on the impact of the project. However, there were some limitations with regard to interpretation and conclusions. On the one hand, the database lacks figures in some parts due to reluctance of farmers to provide information or the loss of data during data transfers. On the other hand, plausibility tests for a limited sample of data showed that certain data lack reliability, a fact which is mainly due to the complex data collection processes, the multiple levels in the data transfer structure and the big number of involved actors (see chapter 4 for more details).

Another limitation for the data analysis was the fact that for each year, separate and independent databases had been established. As unique identification numbers per farmers are missing, too, it was not possible to assess the timeline and development of key indicators from 2008 to 2011 within reasonable time. A limited sample that was reconstructed based on farmer's names did not provide the required reliability and had to be abandoned as an alternative source of information.

Furthermore, the study envisaged to analyze the effective margins and household incomes of LMD farmers achieve from different crops, in order to assess the most profitable crops. However, the structure of the database did not allow for comparing such differences. Therefore general agronomy and profitability calculations were used to estimate average margins (see chapter 3.2.1).

3. Results of Impact Analysis

3.1. Impact on farmer livelihoods

3.1.1. Project beneficiaries

Number of households

Starting in Kyrgyzstan with 157 farmers in 2005, the project achieved an important increase to 2'647 households in 2008 and 4'628 in 2010. In 2011 the number of LMD farmers was subject to a decline to 3'127 – a fact that was mainly due to a change to a result-based compensation scheme for local service providers (see chapter 3.3 for more details).

The LMD project in Tajikistan showed a similar growth in the number of LMD farmers, from initially 200 in 2007 to 2'592 in 2010. The number of LMD farmers in Tajikistan was subject to a decline in 2011, too, albeit to a smaller degree (2'227 farmers) and due to the same reason as mentioned above.

In early 2012, the number of farmers in Kyrgyzstan and Tajikistan was increased to 4'988 and 2'454 people, respectively. The project partners learned to use a new system of payment for work with farmers based on delivered volume by the contract and continue to increase production volume and number of farmers. Such substantial increase in short time was possible because of developed capacities of 24 local partner organizations in both countries working with farmers.

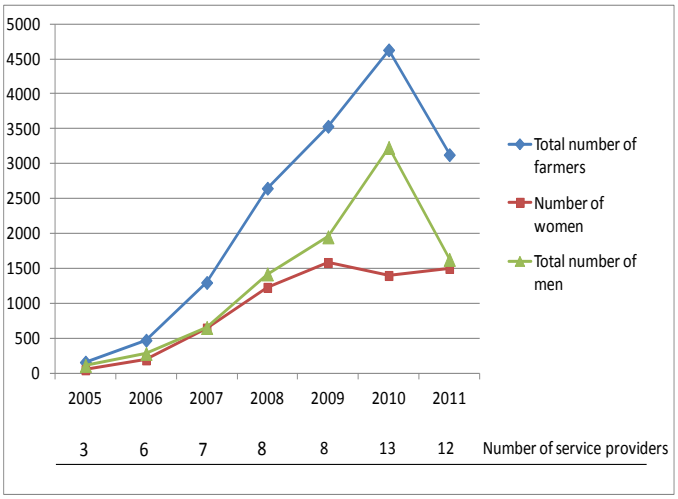


Figure 1: Number of LMD farmers, Kyrgyzstan

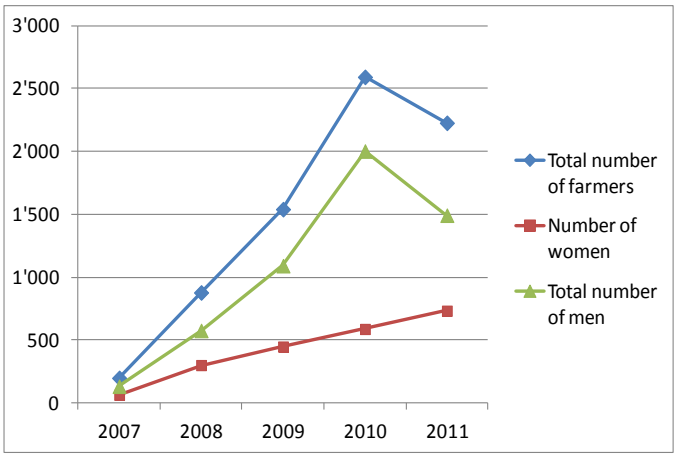


Figure 2: Number of LMD farmers, Tajikistan

Gender

In Kyrgyzstan, the project managed to include both sexes to an almost equal degree. With the exception of 2010, the percentage of LMD women was always between 45 and 50 %. In 2011, only Nooken (30%), Uzgen (17%), Naryn (18%) and At-Bashy region (0%) showed considerably lower participation of women. The project team believes that the low figures in some districts are mainly due unsatisfactory work of LMD partner organization and consultants working in these districts. In order to improve the integration of women in these regions, the project should enhance more direct follow-up and coaching of service providers.

If we look at the total number of farmers in Kyrgyzstan, it is interesting to see that the decline from 2010 to 2011 was mainly due to drop-outs of male farmers, whereas the number of women slightly increased.

In Tajikistan, the picture looks different: Despite a steady absolute increase in female LMD farmers, the percentage of women never exceeded 35% and was 28% in 2011. The main reason for this is the fact that the project works with 750 lemon growers in Southern Tajikistan who are almost exclusively men (only 8 women). Another reason is that the work in the field outside of households is traditionally men's business. The project requires the farmers to use more land which is located farther from their houses

because of production volume. For some women it is impossible to work outside their village. The project should be sensitive to these social factors, but nevertheless try to find mechanisms for enhanced inclusion of women in the LMD activities for the coming phases.

Age groups

As the figures in Annex I a) shows for Kyrgyzstan, the LMD project includes farmers from all age groups. Interestingly, the analysis showed a decline in the share of young farmers participating in the LMD activities in both countries: In Kyrgyzstan the percentage of young farmers (less than 36 years old) decreased from 24% in 2008 to 21% in 2010 and to 20% in 2011. In Tajikistan, the share of young farmers dropped from initially 36% (2008) to 27% in 2010 and to 18% in 2011. Also, as the 2010 data show, women are underrepresented in this age group. On the other hand, the analysis provided evidence that with regard to additional income generated through LMD activities young farmers are most successful.

Considering these findings and the potential of this new income source to stop or even reverse labor migration, the project should strengthen its effort to again include more young people, giving special emphasis on young women.

3.1.2. Land resources

The following table shows the average total land size of households involved in LMD and the average land per household used for LMD in ha and percentage of total land size for the years 2008, 2010 and 2011. The figures on total land include own as well as rented land.

	Kyrgyzstan			Tajikistan		
	2008	**2010**	**2011**	**2008**	**2010**	**2011**
Average total land per household (ha)	1.08	1.50	2.54	0.89	0.95	0.90
Average land per household for LMD (ha)	0.20	0.23	0.44	0.24	0.18	0.23
% of total land used for LMD	19	16	17	27	19	26

Table 2: Total land and share of land used for LMD activities, Kyrgyzstan and Tajikistan

In **Kyrgyzstan**, two main trends become evident: Firstly, there is a trend towards households with more total land. At the same time farmers use more land to grow vegetables and fruits for the local market (over 0.4 ha per farmer in 2011). A main factor is income from LMD activities in previous years permitting farmers to rent more land and up-scale their production. This is a clear success of the project with an important impact on these farmer‘s livelihoods (see chapter 3.1.3 on income generation).

Another factor is the tendency of service providers to include more large farmers who have the potential to supply bigger volumes to processing enterprises. According to a new payment scheme introduced in 2010, service providers receive a volume based commission instead of fix payments per trained farmer (see detailed information in 3.3.2). On the one hand, this tendency certainly needs attention in the coming years, and the local service providers should be given the necessary guidelines and incentives to include small farmers in the LMD activities. On the other hand, the value of successful leader farmers as a good example and motivation for other farmers should not be underestimated and can be an important asset for the sector.

Secondly, the share of land used for LMD activities remained in the range of 15-20% over all years. The question why farmers do not dedicate more land to LMD production in view of the high profitability of vegetables was discussed with partners. As a main reason, the limited labor capacity per household was mentioned: Since vegetable production is not mechanized and rather labor-intensive, and since most households cultivate their land without hiring external labor, up-scaling of the production is directly linked to the available work force in the family. Another reason is the risk of failing to sell perishable vegetables at the market without a well organized chain. Farmers do not want to sell all products by contract since they think the market price could be higher.

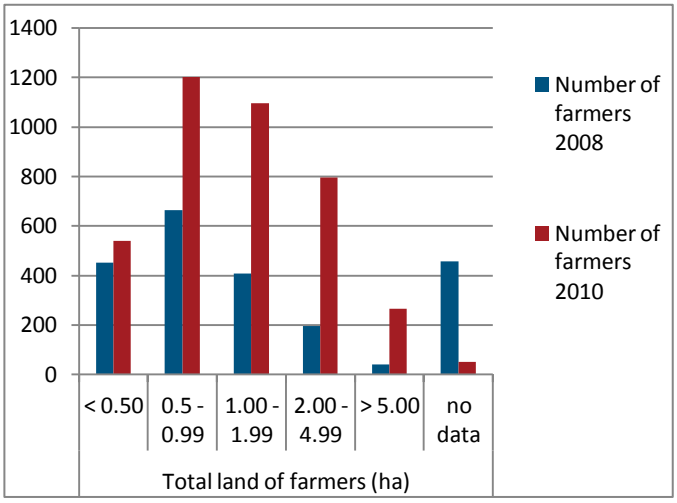


Figure 3: LMD farmers clustered according to total farm size, Kyrgyzstan

A differentiation between farm size groups confirms the trend towards larger farmers in Kyrgyzstan (see Figure 3), but the share of farms with less than 1 ha of total land still amounted to 45% in 2010, thus smallholders still constituting a substantial part of the farmers.

In **Tajikistan**, the average land per household remained in the same range since 2008, and households with less than 1 ha represented 66% of total farmers in 2008 and 74% in 2011. Hence, other than Kyrgyzstan, there is no trend towards bigger land resources per farm. Also, there was no major change in the average share of land used for LMD activities.

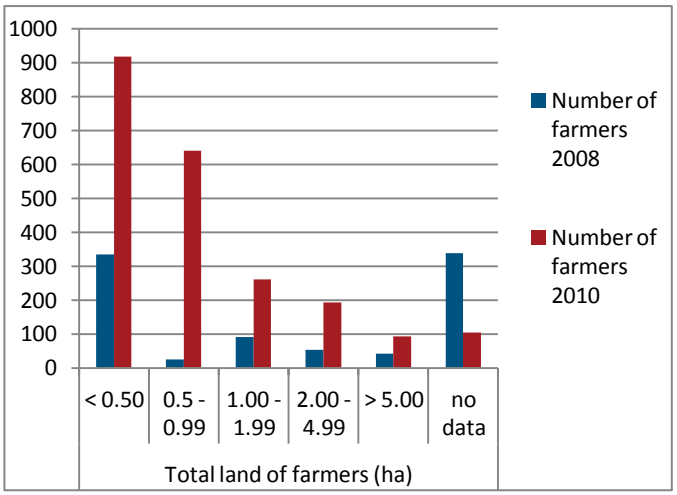


Figure 4: LMD farmers clustered according to total farm size, Tajikistan

On the one hand, these figures prove the strong focus of the project on small farmers and the need for further strengthening this target group in order to increase the additional income per household. They also show that the project did not yet manage to upscale the vegetable production per farm in terms of surface. However, there is a trend towards bigger average volumes of vegetable and fruits per farmer. After an initial drop from 6.7 t in the first year to 2.5 t in 2009 – which was mainly due to the integration of new, inexperienced farmers – the average volumes produced per farmer increased again to 8.2 t in 2011. Considering the fact that LMD surfaces per farmer did not change substantially in this period, the productivity per surface improved substantially.

3.1.3. Income generation trough LMD

Overview on income generated

Table 5 summarizes the income generated through the project at the farm household and the national level in both countries, in 2010 and 2011. Overall, the generated farmer income amounted to 3.9 Mio. and 7.1 Mio. US$ in 2010 and 2011, respectively. In both countries there was a substantial growth in additional income generated per household from 2010 to 2011: 88% for Kyrgyzstan and 291% for Tajikistan. Two factors contributed to the fast income increase in Tajikistan. On the one hand, there was a strong rise in vegetables prices in 2011, almost reaching the double of 2010 levels. On the other hand, the improvement in productivity per farm and surface added to this fast growth.

Furthermore, if we compare the total yearly average income of LMD households in Tajikistan 3'619 US$ with the yearly average income of non LMD households (2'787 US$, control group), the impact of the project on overall income is confirmed.

	2008		2010		2011	
	Kyrgyzstan	Tajikistan	Kyrgyzstan	Tajikistan	Kyrgyzstan	Tajikistan
Additional yearly income per capita generated through LMD (US$)	128	36	91	94	205	274
Average number of household members	6.09	8.05	5.55	7.42	5.57	7.5
Additional income generated per household through LMD (US$)	778	286	504	696	1'139	2'058
Total additional income generated through LMD (US$)	**1'723'717**	**253'146**	**1'993'372**	**1'536'817**	**3'562'379**	**3'600056**
Total additional income, both countries (US$)	**1'976'863**		**3'530'189**		**7'162'435**	

Table 5: Additional income generated trough LMD activities, Kyrgyzstan and Tajikistan

The project generated further income through the creation of permanent and seasonal jobs, as the tables and the graph in Annex III show for Kyrgyzstan:

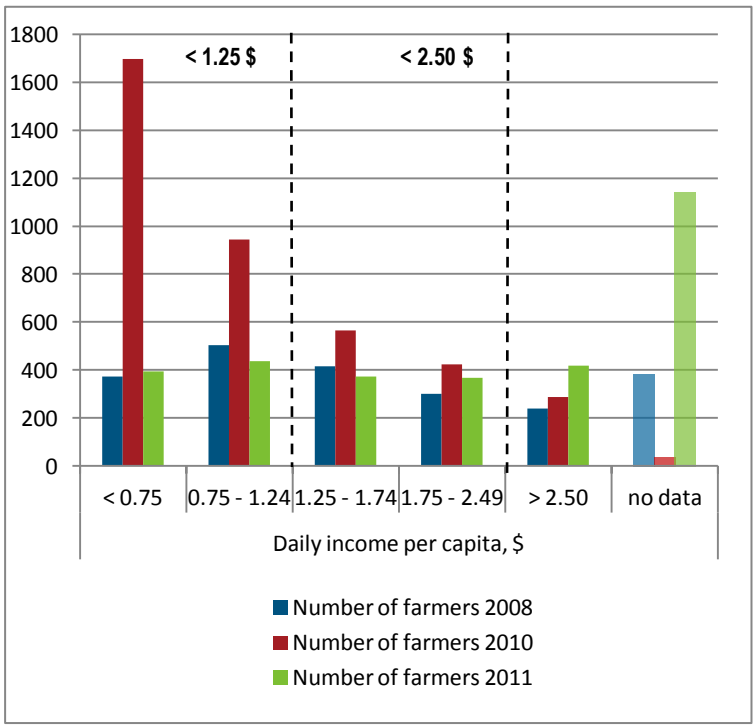
- 38 (including 25 seasonal) and 364 (incl. 330 seasonal) working places in 2008 and 2010
- Seasonal workers have been working in average for 4 months with average monthly salary of 3 000 KGS (2008) and 4 000 KGS (2010). The total income of people employed due to the project activities was 454 080 KGS (12 948 US$) resp. 6 480 000 KGS (138 812 US$).
- 47 permanent jobs were created between 2008 and 2010. Thereof, 30 were IPM trainers who serve different NGOs and extension organization providing training on IPM through FFS in Kyrgyzstan. Another 17 permanent workers were set up in 4 processing companies, three of them are in Tajikistan;
- The majority of the seasonal workers are women (up to 90 %) who are mainly involved in processing of vegetables and fruits at the processing companies (cleaning of vegetables and fruits; grading and putting them into jars).

In Tajikistan, new jobs created additional income as follows:

- 114 seasonal and 19 permanent jobs were created in 2011 due to project work. 114 seasonal jobs correspond to 28 permanent jobs (ILO standard), amounting to a total of 47 (28+17) permanent jobs created by the LMD project.
- The average monthly salary amounted to approximately 300 TJS (or 3 000 KGS).

Farm income generation in Kyrgyzstan

In Kyrgyzstan, 67% of farmers had a total daily income per capita of less than 1.25 US$ in 2010, hence belonging to the group of absolute poor according to the UN definition (see Figure 5). 25% belonged to the group of poor, earning a daily income of 1.25 to 2.5 US$. In 2011, the picture looks different: 42% of LMD farmers were in absolute poverty, earning less than 1.25 US$ per day, whereas 21% had an income between 1.25 and 2.5 US$. On an average, the LMD project contributed 35% of total farm income through the margins of vegetable and fruit production in the years 2008 to 2011, with variations between 10% (Bazar-Korgon and Ton) and over 60% (Ak-Suu region) in 2011. As project data prove, there is no significant difference in income generation between men and women: Both sexes achieved equal levels of additional household income trough LMD activities (see figures for 2010 in Annex I b). The figures for 2011 were not yet available at the time of the analysis.



There are two challenges regarding the interpretation of income figures. Firstly, farmers are often reluctant to provide information on income. For example in the 2011 survey in Kyrgyzstan, 36% of the farmers denied to indicate their income situation. Secondly, figures on income might have a social bias as some farmers are not willing to declare their income accurately. – Still, the impact assessment team considers the existing basis of income data sufficient and reliant enough as to identify main tendencies and to show the clear orientation of the LMD project towards absolute poor and poor farmers.

Figure 5: LMD farmers clustered according to total daily income per capita, Kyrgyzstan

On the one hand, these findings show that the emphasis of the program is still strongly with poor and very poor farmer households. And secondly it shows that a significant number of farmers were able to escape absolute poverty and poverty thanks to the new income opportunities offered by the project.

Furthermore, the analysis provided interesting findings with regard to different age groups (see Figure 6): Very young (less than 20 years old) and young farmers (20-35 years old) proved to be most successful in terms of average gross margin generated through LMD activities, especially young men. In view of increasing labor migration of especially young household members to neighboring countries, the profitability of market oriented vegetable and fruit production may be an important incentive for young people to stay at their farm. Hence, these new perspectives provided by the project young family members might avoid or even inverse migration streams in the villages where the project is involved. Therefore and in view of the declining shares of young farmers in LMD (see 3.1.1), the project should put enhanced emphasis on involving young farmers in the LMD activities.

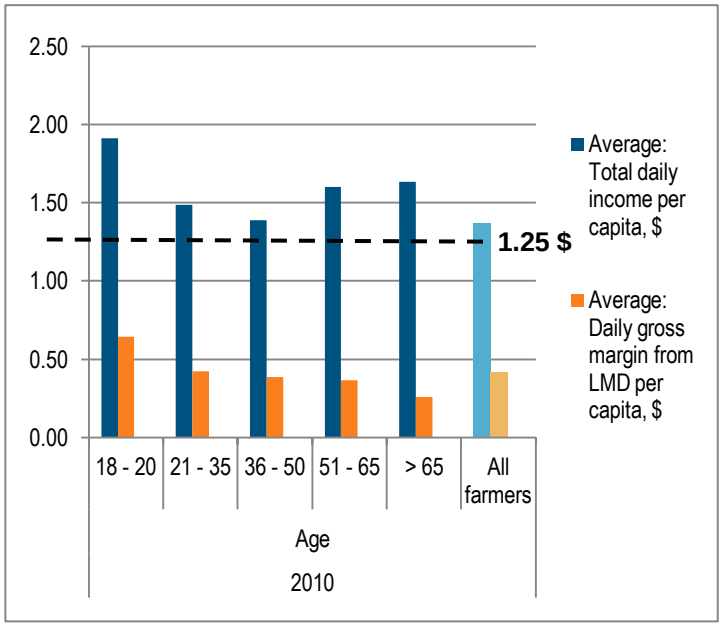


Figure 6: Daily total income and LMD margin achieved per age group, Kyrgyzstan 2010

Farm income generation in Tajikistan

In Tajikistan, 89% of farmers had a total daily income per capita of less than 1.25 US$ in 2010, hence representing a large group of absolute poor according to the UN poverty standard (see Figure 7). 9 % belonged to the group of poor, earning a daily income of 1.25 to 2.5 US$. In 2011, only 46% of LMD farmers were in absolute poverty, earning less than 1.25 US$ per day, whereas 42 % had an income between 1.25 and 2.5 US$. On an average, the income generated through LMD activities in 2011 constituted 62% of the total farm household income, varying between 27% (Abdrahman J.) and 91% (Kumsangir region).

These findings show the high economic relevance and impact of LMD project on farmer livelihoods in Tajikistan, and there is evidence that a substantial part of the farmers of the project were able to escape absolute poverty and poverty thanks to the new income opportunities trough local market oriented vegetable and fruit production. Also, the figures show the continued focus of the program on poor and very poor farmer households, which was 88% in 2011.

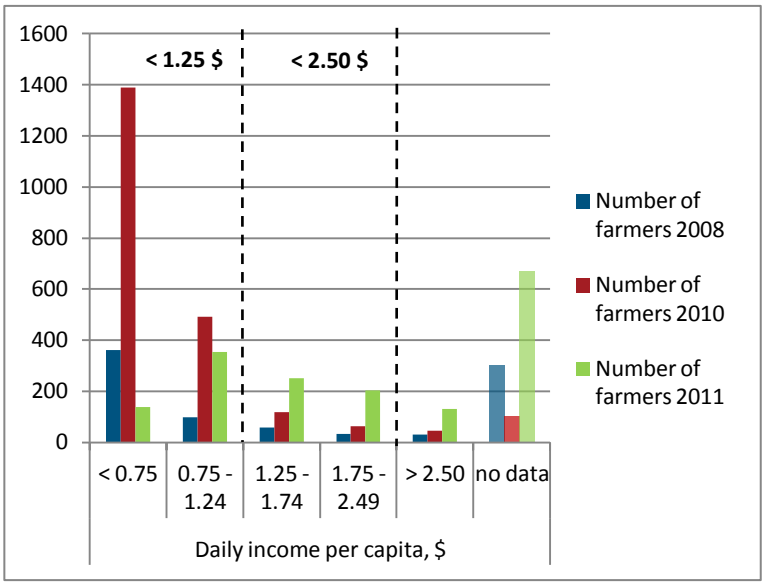


Figure 7: LMD farmers clustered according to total daily income per capita, Tajikistan

The share of household income generated through LMD activities in Tajikistan reached 60% in 2010 (62% in 2011) compared to only 25% in 2008. Female and male farmers achieved equal levels of additional income over all years.

The above described tendency of young Kyrgyz farmers being more successful than older farmers seems to be even more evident in Tajikistan, as the graph in Annex I c) shows. However, the ratio of young farmers below the age of 36 declined from 36% in 2008 to 18% in 2011. The project team explains this trend by the increasing number of lemon producers who in majority are older men. Since the high profitability of vegetable and fruit production is a potential incentive for young farmers to work on the farm instead of migrating to urban centers or abroad, the project should strengthen the efforts to include more young people in the LMD activities.

3.2. Impact on production systems

The coverage of the project in the domestic vegetable production is considerable: In 2011, LMD farmers covered roughly 1 % of total arable land in Kyrgyzstan and 0.3 % in Tajikistan. The LMD farmers produced around 2 % of tomato and cucumber production, 1 % of potato in Kyrgyzstan and around 4.4 % of vegetable production (tomato and onion) in Tajikistan.

3.2.1. Profitability of vegetable and fruit production

Change in productivity

From initially two products (tomatoes and cucumbers), the project in Kyrgyzstan increased the product diversity to 15 different fruits and vegetables in 2011 (see list of crops in Annex VI). The crops grown most in terms of surface are tomatoes, onion, potato and cucumbers. The average vegetable production per one farmer in both countries increased from 0.7 t in 2005 to 6.4 t in 2011, while this figure was 6.4 t per one producer in Kyrgyzstan and 8.2 in Tajikistan. Out of 1 388 ha of land in both countries under production of 15 crops, around 38 % were under tomatoes, 16 % under potato, 12 % under cucumbers, 10 % under onion and the rest 24 % under 11 other crops.

While the average potato yield of all farmers in Kyrgyzstan was 15.8 t/ha in 2011, the LMD farmers on average reached 20.7 t/ha, which is more than 30 % higher. The average vegetable yield was 18 t/ha, but in the case of LMD farmers it amounted to around 26 t/ha or around 45 % higher[1]. The same situation can be seen with the LMD farmers in Tajikistan who achieved around 50 % higher yields than in average statistics.

Impact of vegetable production on farm economics

In order to assess the impact of the LMD project on farm economics, the evaluation team compiled cost-benefit statistics of different crops for Kyrgyzstan. Annex II provides detailed information and statistics on relevant figures. The profitability of the mentioned vegetables in Tajikistan is about the same or slightly above Kyrgyz levels.

On the one hand, input and labor costs for most vegetables are considerably higher than the costs for wheat production, which increases the economic risk for the farmers. In Kyrgyzstan for the year 2011, the average input costs per hectare for potato, cabbage, tomato and cucumber amounted to 1'900 US$, 1'200 US$, 960 US$ and 387 US$, respectively compared to 260 US$ for wheat. Of the mentioned crops labor intensity is by far highest for tomato (1'202 working hours per ha), compared to 475 h, 408 h, 399 h and 350 for potato, cucumbers, cabbage, and wheat respectively.

On the other hand, due to the good prices for vegetables, farmers can achieve high profits by cultivating vegetables. The profit per hectare is highest for tomatoes (8'900 US$ / ha), compared to 5'400 US$, 3'900 US$ and 760 US$ for cabbage, cucumber and potato, respectively. All these figures are by far above the profitability of wheat which is approximately 160 US$ per hectare, according to current market prices (2011). If we look at the profit farmers potentially achieve per working hour, the picture changes: Due to the labor intensiveness of tomato, the profit generated per working hour amounts to 7.35 US$, which is considerably below the profit from cabbage (14.50 US$) and cucumbers (9.60 US$), but higher than potato (1.60 US$). All of them are well above the profitability per working hour of wheat (0.5 US$) and also cotton (1.2 US$).

From these figures on crop profitability we can conclude that

- Vegetable production in Kyrgyzstan and Tajikistan is highly profitable, the profitability level being between 625% for cucumbers, over 300% for tomatoes and cabbage and 130% for potatoes. Hence the promotion of local market oriented vegetable cultivation promotion is highly relevant and justified for smallholders who are able to produce surplus beyond their food self-sufficiency and who manage to gradually do the necessary investments.
- Farmers need minimal means for initial investments, be it through own funds or micro-credits, in order to successfully start their small business with vegetables. For very small farmers without surplus potential this is hardly possible. This confirms why the main target group of the project are not subsistence farmers, but small market oriented farmers.
- For households where family labour capacity is limited and where hiring external labour is not possible, crops with high profitability per working hour such as cabbage and cucumber offer an interesting option. Cucumber is also among the best options for risk-averse farmers (relatively low input costs, high profitability).

3.2.2. Impact on food security

The project's main target groups are farmers with small surplus production, hence the acute lack of food self-sufficiency for staple crops seems not to be a priority problem for most households within LMD However, the following (theoretical) calculation example of crop profitability illustrates how the food security of farms and regions can be enhanced by the cultivation of high profitable vegetables, which provides households with comparative advantage and more purchasing power. All calculations are done for 1 ha of land:

[1] Data of National Statistc Committee of Kyrgyz Republic, 2011.
http://212.42.101.124:1041/stat1.kg/images/stories/docs/Kyrgyzstan%20v%20zifrah/Selhos/14.pdf

		Wheat	Tomatoes	Potato	Cotton
1	Agricultural Input, KGS	11 780	43 150	85 650	32 500
2	Field work, KGS	5 200	116 000	30 250	29 500
3=1+2	Total Production Costs, KGS	16 980	159 150	115 900	62 000
4	Yield, kg/ha	3 000	60 000	30 000	2 500
5	Market price, KGS/kg	8	7	6	35
6=4*5	Income, KGS	24 000	420 000	180 000	87 500
7=6-3	Gross Margin, KGS	7 020	260 850	64 100	25 500
8	Price of 1 kg of flour, KGS	29	29	29	29
9=7/8	Gross Margin, calculated in kg of flour	242	8 995	2 210	879
10=9/50	**Equivalent number of sacks of flour**	**48,0**	**179,9**	**44,2**	**17,6**
11=6/3	**Profitability, %**	**141%**	**264%**	**155%**	**141%**

Table 6: Cost-benefit calculation and equivalent in sacks of flour for different crops (margins exclude sale, VAT and profit tax).

A common critique of such market oriented approaches is that vegetable production may increase the food-insecurity of households due to their higher dependency on cash, which – in the case of a total crop failure or high wheat prices – would deprive them from the possibility of buying sufficient staple food. Up to now, most LMD farmers grow vegetables only on small parts of their land (15-25%), whereas producing wheat on the rest of the surface. Hence, in the current situation the above mentioned risk is minor, but it needs to be taken into consideration in the further development of the project and the production systems.

3.2.3. Use of IPM and organic farming methods

The project successfully introduced Integrated Production Management (IPM) with the aim to use farm inputs more efficiently and minimize chemicals to the necessary minimum. In Kyrgyzstan, the number of farmers involved in IPM production increased from initially 107 (2005) to 670 in 2008 and 1 821 in 2011. In 2011, 77% of all farmers applied IPM on their farm. From the period between 2008 and 2011, the share of LMD land cultivated according to IPM increased from 26% to 87%. The graph below provides detailed figures for the last 4 years. Due to incomplete data, the database from Tajikistan could not be used to make conclusions with regard to IPM methodologies.

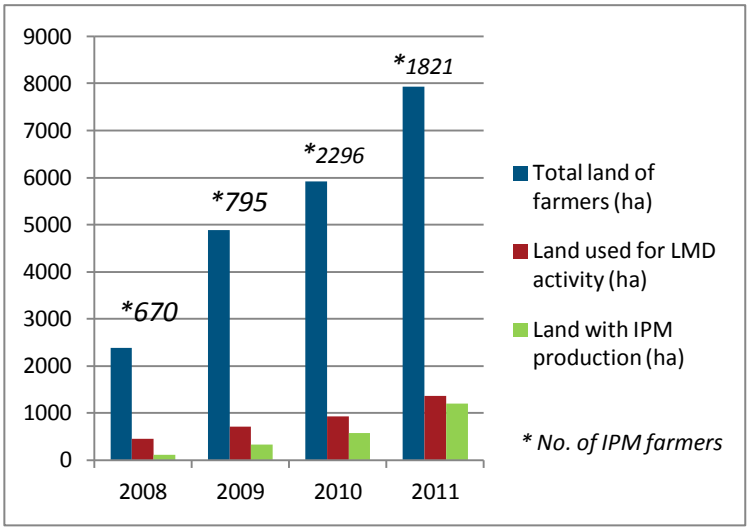


Table 7: Total surface used for LMD and IPM, Kyrgyzstan

The growth in IMP surface also corresponds to the growing share of volumes produced from IPM farmers, especially in the last two years: Out of the total LMD production it reached 25% in 2008, 20% in 2009, 64% in 2010 and 77% in 2011.

Farmers reported a high and increasing demand for vegetables that are grown according to IPM principles, also on local fresh vegetable markets. A farmer group visited near Bishkek said their products were always the first to be sold out on the local market due to their better taste and the growing consciousness of buyers with regard to high chemical residue contents in conventional vegetables and fruits. This is an

indication for the important potential for IPM or even organic vegetables produced for domestic markets in Kyrgyzstan and Tajikistan.
There is growing interest from farmers in organic production methods. Results of the organic cotton project in Kyrgyzstan and Tajikistan are encouraging. They show that same or even higher yields can be achieved and production costs can be reduced when organic farming is applied properly, resulting in a higher net income for the farmers. Therefore, even though current prices for organic products on the local market are not significantly higher than conventional ones (certified or not), farmers have an interesting incentive to go for organic. The preference of local consumers for a more natural and healthy product further add to this tendency.

3.3. Impact on sector development

The intervention approach of the LMD project to involve processing enterprises as key drivers for the development of local vegetable and fruit value chains, combined with permanent efforts to build up capacities of local NGOs who provide the required support to the farmers with regard to farming practices, inputs, financial services and marketing had a major impact on the domestic fruit and vegetable sector of both countries.

3.3.1. Contract system

The project elaborated the contracting system between farmer groups and processing and trading companies. The farmers receive support from their supporting organization (NGO, Extension Services) in the negotiation with processing and trading companies. Usually, the contract is signed by the leader of the group on behalf all members. The share of contracted volumes is similar for most of the groups: The smallest contracted volume is for tomatoes, with roughly 35 % of the total produce, 56 %for cucumbers, 74 % for onion, 92 % for cabbage and 100 % for vegetables grown in greenhouses. These figures show a tendency: The smaller the difference between market price and price offered by the processing and trading companies is (small price difference for cabbage, big difference for tomatoes), the higher is the contracted share.

The contract fulfillment and volumes commercialized trough contracts with processing enterprises and trading companies increased significantly. In Kyrgyzstan, the delivered volume to processing companies by contract with LMD farmers was 2'202 tons in 2008 and increased by 5 times to 10'486 tons in 2011. In Tajikistan, the delivered volume to processing companies by contract with LMD farmers was 1'054 tons in 2008 and increased by 10 times to 10'172 tons in 2011. Around 90% of the volumes are sold at the domestic market.

3.3.2. From farmer based to volume based payment

An achievement of the project is a systemic change in the service provision through the partners. Whereas up to 2009 the local NGO's were paid from the project per trained farmer (supply driven), the new compensation model is based on volume of produce provided to the processing enterprise, for which these latter pay a provision of 10% to the service provider (demand driven). The diagram below presents the logic of the scheme:

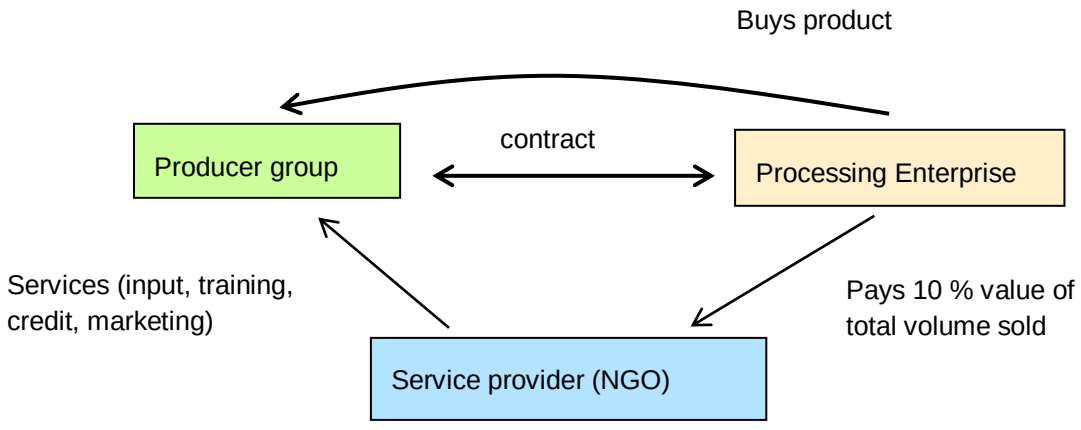


Figure 8: LMD service provision and compensation scheme between farmers, NGOs and PE

There are several advantages of this new approach. It is demand driven, and service providers have higher incentives to ensure that quality of the capacity building and extension is high. Also, there is higher accountability of NGOs towards producers and processors and the NGOs gradually emancipate from their donor dependence, which is likely to lead towards increased autonomy of the sector and likely pull-effects on other farmer groups. Overall, this change to an outcome based payment is certainly a step towards enhanced sustainability of the value chain system. However, the volume based payment system has the risk of creating incentives for the service providers to work with larger, more experienced and less remote farmers. The growing average farm size of LMD farmers in Kyrgyzstan confirms this tendency, a fact that the project needs to observe with attention.

As a direct consequence of the systemic change, the costs of services per farmers have decreased substantially since 2005. In 2011, the average service cost per kilogram of produce amounted to 0.56 Som, including all services for input, training, credits and marketing. This is low compared to current prices (i.e. tomato, bad quality: 5 Som/kg; onion: 11 Som/kg; lemon: 30 Som/kg). Project partners (NGO and ES) sold services for 14'076 CHF in 2009, 44'666 CHF in 2010 and 77 305 CHF in 2011. It makes 22 % of mandated amount in 2011.

3.3.3. Crowding and replication

Starting with 3 local service providers in 2005, the project increased the number to functional NGOs who offered capacity building to farmers in IMP farmer field school methodology in 2011. There were 23 local organizations in both countries using IPM methodology in their work with farmers. The project managed to delegate more and more responsibilities to these partners, including the surveying, monitoring and analysis of the project database.

From substantial drop-outs of farmers in the first years, the project managed to reduce the rotation of farmers to 25% in 2011. The more continuous and permanent engagement of farmers in local market production may be put down to improved support of the farmers from the service providers, enhanced trust and positive experience with processing enterprises and trading companies.

A few other donor-funded projects working with the same partners started to use the same approach in their work. The training of farmers in IPM is going through Farmer Field Schools which are good tools for informal farmer group development, namely for trust, contractual relationships and production development.

3.4. Costs and return on investment

In 2010 the ratio between US$ invested per farmer and the average income achieved per farmer was 1 : 13.5, and in 2011 it reached 1 : 33,6. This is a substantial growth since the beginning of the project in 2005 (1 : 0.5). The following figure shows the return on investment of the project with regard to income generated at the farm level, for different years (y axis in logarithmic scale):

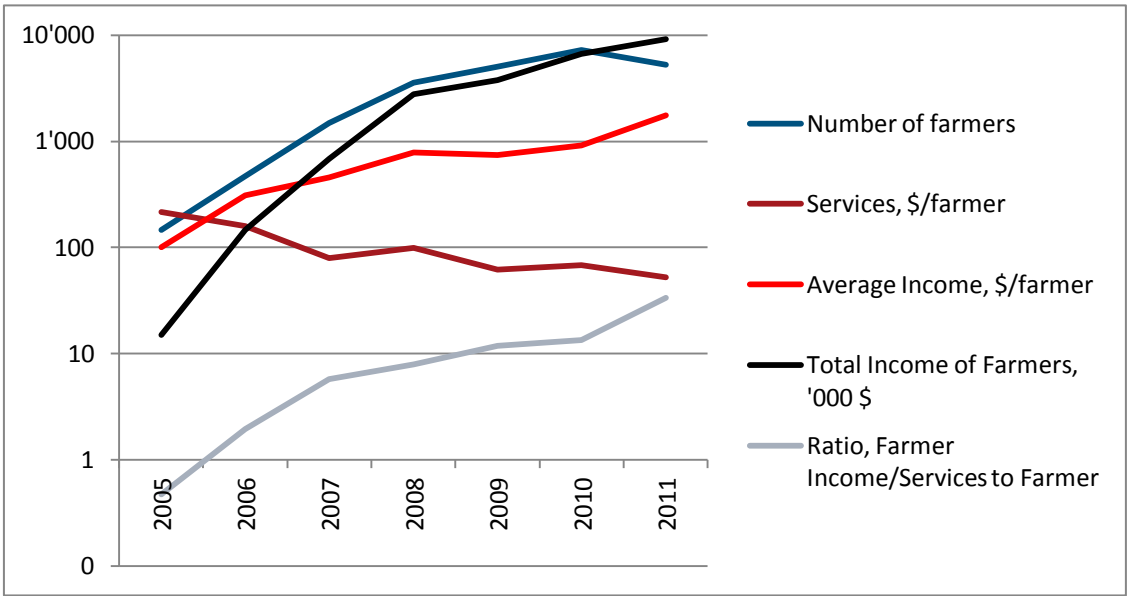


Figure 9: Return on investment of the LMD project

4. Use and further development of LMD database

The data collection and analysis of the LMD project is outstanding: The project realized complete surveys of LMD farmers over the last 4 project years, by means of 50 indicators and an Access database. This allows for a detailed analysis and monitoring of key parameters and joint learning. From the beginning, the project involved the local service providers in data collection, compilation and analysis, gradually handing over more responsibility to them, thus strengthening their ownership and common learning experience. Based on first experiences, the project also managed to streamline and harmonize the data collection and database structure to a certain degree.

In spite of these achievements, the data collection and transfer is not sufficiently efficient, prone to mistakes, and the amount of data is too big as to be managed within realistic time and affordable costs. At the time, the costs for database management are fully covered by the project, but they should be internalized by local partners using the data in the middle run. Also, the experience of this impact study showed that despite considerable improvements since the beginning, data reliability is not yet sufficient due to incorrect and missing data. Hereafter, the main conclusions and recommendations for an improved functionality, further improvement and use of the LMD database are presented.

4.1. Simple data flow structure

The data flow structure has a big influence on costs and the probability of errors. The more data transfer levels and people are involved, the more costly is the data transfer, and the more likely are losses and wrong data manipulation. Figure 10 shows the current and the recommended data flow structure of the LMD project. We can conclude:

a) The data flow structure of the LMD project is too complex. It includes too many people at five levels, which results in long and error-prone data transfers. At the time of the impact study, 24 NGOs were involved at the interface between farmer groups and regional LMD staff.

b) It is recommended to assign only two NGOs (one for each country) with the centralized survey, compilation, harmonization and also basic analysis of the data. These two NGOs should constitute the direct interface to the LMD project coordination, thus eliminating two data transfer levels.

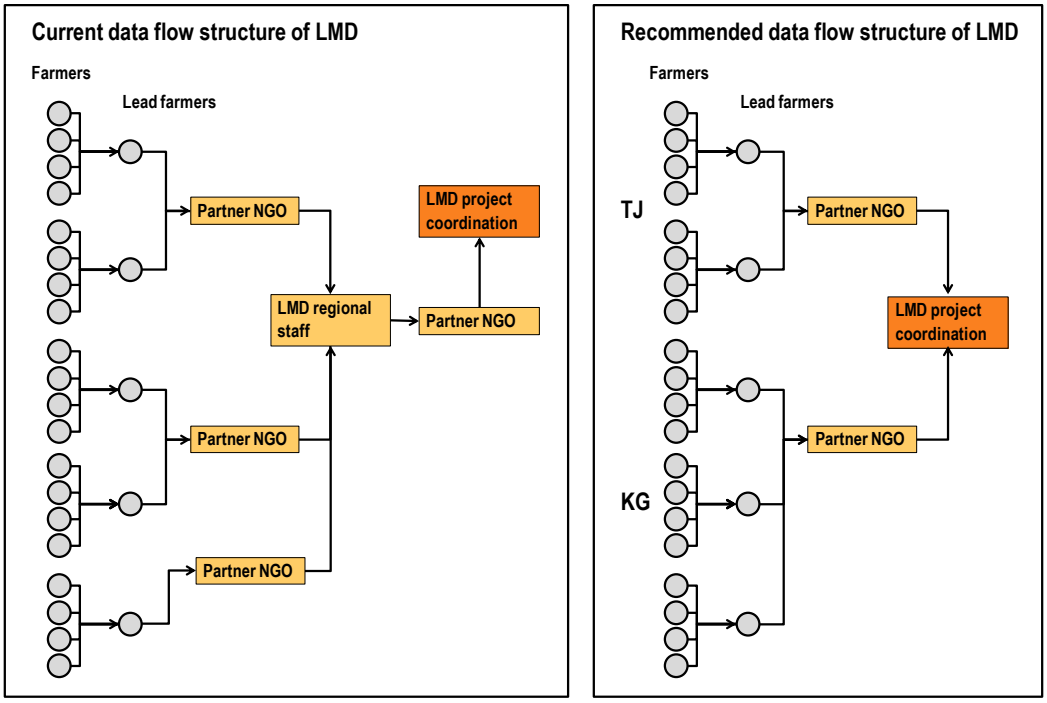


Figure 10: Current and recommended transfer structure in LMD project

4.2. Manageable range of indicators

There is a direct relation between the number of surveyed parameters and the costs for database management. Therefore, indicators should only be selected based on need and demand and their number kept to a minimum. Although the range of indicators in the LMD database was reduced from initially 100 to currently 50, the LMD database is still very extensive, and management costs are high. On the other hand, certain key topics are not yet covered. It is recommended to

a) Re-assess the real need for information of key stakeholders (producers, processors, traders, NGOs, donors), with special eye on the commercial use of the data.
b) Omit and simplify indicators that are of no or limited use, of minor importance for coming phases or too difficult to be surveyed (e.g. big rate of missing data).
c) Add key indicators on the following topics:
   - Food security and vulnerability to climate change, e.g. crop lost due to drought, number of months of food self-sufficiency;
   - Ecological sustainability: type and amount of agro-chemicals used, organic manures, organic pest management, soil conservation measures;
   - Farming activities previous to joining LMD project, e.g. product grown instead of vegetables before (attribution).

4.3. Streamlined processes and formats

Two important facts are seriously hampering the effective use of the LMD database. On the one hand, there are a lot of missing data, especially in 2011 where 36-38% of data on income were missing. On the other hand, project partners involved in data collection reported frequent misunderstandings among lead farmers and local partners who conduct the interviews, with regarding to the naming of products, as well as terms and units (e.g. surface). This repeatedly led to erroneous data that could not be used for further analysis. Another source of errors is the data transfer from hand written questionnaires (not readable, wrong copying) to electronic versions, as well as from Excel files (local NGOs) to Access database files (AgroinformAsia, AgroLead, Helvetas). To overcome these drawbacks the project should;

a) Simplify the data collection and transfer procedures as much as possible. For example, use multiple choices in questionnaires. Also, the idea of scannable questionnaires was discussed as an option. This would omit the manual typing in of data. A very modern way of data surveying would be the primary collection by means of Smart phones and the direct sending of the primary data to a central server;
b) Harmonize and simplify the formats for data collection: the survey questionnaires should be identical in all regions, as short as possible, and clear and unambiguous for all users. They should be easy to handle and contain terms and units that are used in the respective context. The instructions have to be clear and simple. Reducing the number of indicators helps a lot simplifying the formats (see 4.2). Data conversion between different software should be avoided as much as possible (e.g. Excel – Access);
c) Harmonize the timing of data collection, defining binding deadlines for the local partners to provide the collected data;
d) Reduce the number of institutions and people involved in data collection and transfer (see 4.1).

4.4. Control group and individual identification

In an earlier impact analysis in 2008, an important attribution gap did not allow for making concise conclusions with regard to the project contribution to farmer incomes. The new LMD database established in 2008 allowed filling this attribution gap to a certain degree. However, the database lacks two fundamental elements:

a) Individual identification number: Each beneficiary should be allocated an individual identification number that is used for each year anew. Once a farmer leaves the program, his or her identification number should <u>not</u> be allocated to other beneficiaries. New farmers should receive new numbers, that have never been used before. This allows for making comparisons along the timeline of each farmer during several years, to monitor the drop-outs and fluctuations, and to survey all farmers that were ev-

er participating in the program. It also provides the possibility of analyzing the motives of farmers who leave the project.

b) Control group: In order to clearly attribute livelihood improvements to the achievements of the project, a statistically significant control group of comparable non project beneficiaries needs to be surveyed. As for project beneficiaries, members of the control group need to be allocated an individual identification number and to be surveyed over several years. The ex-post control group established in 2011 (82 farmers in Kyrgyzstan, 60 farmers in Tajikistan) was too small and statistically not significant.

4.5. Expertise and commitment of partners

Not only should the staff that compiles and manipulates project data have sufficient technical expertise in the handling of the database software. An even more crucial factor to ensure reliability of the data is their ownership and commitment towards the project and its cause. A service provider who considers his job as simple typing in of data is likely to oversee mistakes and non plausible data and has no incentive to bring in feedback.

The ultimate goal of the LMD database is to provide local partners with a tool that allows for autonomous coordination and facilitation of local market development in the vegetables and fruits sector. Currently, the database is still funded and managed to a big extent by the Helvetas Swiss Intercooperation, but the possibility of gradual handing over to two main service providers – AgroinformAsia inKyrgyzstan and AgroInform TJ in Tajikistan – was discussed as a realistic option. The teams of the two partners show high commitment and considerable technical capacity for the management and further database development. Yet, two aspects will be essential for the success of such a handing over:

a) Profitable commercial use of the data base: The data analysis derived from the LMD database is a potential service the NGOs can sell to different clients, e.g. providing production data to input and processing companies, or information on production regions to traders. The project should assess promising commercial opportunities, develop suitable services for clients and orient data surveys and analysis towards existing demand. According to project estimates, the costs for the database management amount to 13-15 US$ per farmer and year. By streamlining the database structure and data flows, costs can be further reduced.

b) There is a need for sound **capacity building** of the partner NGOs in **statistics**, efficient and target-oriented analysis of data and commercial database management. Currently, all sort of data analysis is carried out, but only a small part of it is really used, and with variable reliability. Through more professional and demand oriented database management, the profitability of commercial use of project data can be significantly improved.

5. Conclusions

→ **Continued focus of LMD project on poor farmers**: The majority of LMD farmers belong to the absolute poor and poor, although their share decreased in the last years. In 2010, 67 % (KG) and 89 % (TJ) were absolute poor according to the database, in 2011 they represented 42 % (KG) and 46 % (TJ) of all LMD farmers. These findings are a strong indication against the conclusion of earlier evaluations that most LMD beneficiaries belong to the group of better-off, small market oriented or even fully market integrated farmers. At the same time, the data need to be interpreted with caution since a lot of data are missing, especially in 2011 where 36 % (KG) and 38 % of data were missing. Moreover, information on income is a socially sensitive topic and surveys often depend on farmer's estimates and memories.

→ **Substantial income generation**: The LMD project contributes significantly and increasingly to income generation in the vegetable and fruit production sector in both countries. In 2011, 3'127 and 2'227 farm households in Kyrgyzstan and Tajikistan achieved average incomes of 1'139 US$ and 2'058 US$ per year, respectively, from LMD activities (2010: 504 and 696 US$, respectively). In Tajikistan the average LMD income represented 62 % of total household income in 2011, in Kyrgyzstan 35 %. In Tajikistan (2011) LMD farmers earned 23 % more than comparable non LMD farmers. Additionally, LMD had created a total of 81 permanent and 444 seasonal jobs by 2011.

→ **Gender balance in Kyrgyzstan, imbalance in Tajikistan and between regions**: In Kyrgyzstan, equal numbers of men and women participate in the LMD project, albeit with great variations between regions. In Tajikistan, the total share of female beneficiaries is considerably lower (28-35%), mainly due to social implications. Male and female beneficiaries in both countries achieve the same income from LMD. Yet, the data provide no evidence about decision making processes and power relationships within the households. As seen in Tajikistan, women are subject to serious limitations due to their traditional role of staying in and near the house. The project should be sensitive to these social factors, trying to find mechanisms for enhanced inclusion of women in the LMD activities for the coming phases, especially in Tajikistan and in Kyrgyz regions with low participation of women.

→ **Incentives of LMD against labor migration of young people**: In both countries, young farmers are the most successful in terms of income generated from LMD. However, the share of young LMD farmers steadily declined from 25- 35 % in 2008 to only 18-20 % in 2011. The high profitability of vegetable production offers a realistic alternative source of income for young migrants. The LMD project has thus the potential to provide attractive incentives to young people to return to their village, thus stopping or even reversing labor migration trends. The project should strengthen its effort to include more young people, with special emphasis on young women.

→ **Trend towards bigger farms in Kyrgyzstan**: In Kyrgyzstan, the average farm size of LMD households increased from roughly 1 ha (2008) to 1.5 ha (2010) and 2.5 ha (2011). One explanation is that some farmers were able to up-scale their production through additional leasing of land. This is part of the "natural" cycle of such a project and can be stated as clear success. On the other hand it must be assumed that service providers have incentives to preferably work with larger, more experienced farmers due to the new volume-based payment model. This trend is subject of concern and should be observed with caution in both countries by means of the project database. The project should introduce additional mechanisms to give service providers incentives to include small farmers, e.g. trough a farmer graduation scheme or partly subsidy systems from governments or producer/processing for smaller farmers.

→ **Ambivalent impact on food security**: The results of this analysis suggest that the LMD project helps improve the farmers' food security. Firstly, the argument that cash crop production puts farmers at risk due to their higher dependence on cash and market prices seems not to apply to most LMD farmers, since they only cultivate a small part of their land with marketable crops (15-25%). Secondly, with the revenues from profitable vegetable sales farmers are theoretically able to buy a multiple of staple food that they could grow instead. Nevertheless, earlier evaluations came to the

conclusion that a significant number of households are still not food-secure. It is a fact that vegetables and fruits are crops of high economical and climatic risk. Unfortunately, the database does not provide direct information on the food security situation of farm households. The project should put more emphasis on this aspect in coming project phases and find mechanisms to identify farms at risk of temporary and permanent food insufficiency, adapting intervention measures where needed. For this end, the project database should be completed with indicators on food security.

→ **Enhanced sustainability of production systems**: In Kyrgyzstan, 77 % of LMD farmers applied IPM standards in 2011, representing 87 % of the total surface of LMD producers. Thanks to IPM methods agro-chemical inputs and production costs were considerably reduced. On average, LMD farmers achieve 30 to 50 % higher yields than conventional farmers.
Furthermore, a growing interest in ecologically sound and healthy vegetables and fruits is observed with domestic consumers and buyers. There is a good potential for organic vegetable production and marketing, but the project did not promote it so far. Organic farming should be explored systematically in coming project phases as it has the potential to further reduce production costs, create additional revenues, and eliminate the use of harmful agro-chemicals.

→ **Decisive impact on domestic fruit and vegetable sector development**: The project established sound contract systems between producers and processing enterprises, offering more secure and stable marketing opportunities to the farmers. Depending on the product and actual market prices, LMD farmers sell between 35 and 100 % of their produce to processors through contracts. Contract fulfillment and percentage of sold volumes increase every year.

→ **Establishment of efficient service provision system**: By 2011, the project has been working with 24 local organizations in both countries, delegating more and more responsibilities to these partners. Through the new volume based payment scheme introduced in 2010, the quality of capacity building, the accountability and autonomy as well as efficiency of service trough the partner NGOs was improved. The return on investment – measured as ratio between 1 US$ invested per farmer and average income achieved – increased from 1 : 0.5 (2005) to 1 : 13.5 (2010) and 1: 33.6 (2011). As mentioned before, the drawback of the new compensation model is the trend that service providers have a preference to work with bigger farmers.

→ **Development of an extensive database and systematic learning processes**: The complete survey of all LMD farmers by means of 50 indicators over the last 4 project years is a great achievement of the project, which allows for detailed analysis, monitoring of key parameters and the transparent communication of results to donors and partners. Data collection, compiling and analysis are mainly carried out by the local service providers, thus strengthening their ownership and common learning. To ensure the improvement and continuation of the database on an autonomous and commercial basis, a significant control group has to be established, the data collection and transfer processes need to be simplified, formats harmonized and the number of responsible partners reduced. The successful handover of the database management to one or two service providers depends on the identification of selling opportunities and the sound capacity building of these partners in statistics and demand-oriented data management. In order to fill remaining attribution gaps and ensure the possibility of timeline comparison, the project needs to survey a control group with a significant number of farmers and introduce individual identification numbers for LMD farmers.

6. Future development of LMD project

Based on the results of this impact study, five strategic directions were identified for the future development of the project.

1) **Fill gaps in the VC system**:
   The project has reached a stage where local partners are ready to gradually take on the function of further outreach to more farmers and regions. The volume-based payment system of service providers and the triangle linkage between service providers, farmers and processing enterprises is a good basis for the sustainability of the value chain. In the coming years, the project should phase out its outreach to new farmers and concentrate on filling gaps in the VC system. As stated during the mid-term evaluation 2011, traders could play an important complementary role in the domestic fruit and vegetable sector, buying non-contracted fresh products from farmers, creating access to further domestic and regional markets, and broadening the range of products. The project should promote the building of one or several overall accepted trade partners. Also, there is a potential for processing enterprises to take up further functions such as input supply, quality management, lobbying and exploring new markets. Furthermore, the project should strengthen its efforts at the policy level, trying to influence systemic changes and foster a conducive environment and sector coordination, e.g. through fruit processing associations. The project should also work towards more support from government authorities in the sector development.

2) **Improve efficiency and orientation of service provision**:
   The output based compensation model of service providers is an important milestone towards the institutional and economic sustainability of these services. Yet, currently the share of service costs covered by the contracts with processing enterprises is only in the range of 22%. In the coming phase, further mechanisms need to be developed to strengthen the financial and institutional autonomy of the service providers. Options for complementary or additional funding mechanisms from the government or associations should be explored, for example oriented towards more disadvantaged, smaller or more remote farmers. The visible trend of service providers to work preferentially with bigger and more experienced farmers needs to be met with additional incentives, e.g. by the complementary introduction of a graded payment scheme where service providers receive project funds additionally to the volume-based provision, depending on certain criteria such as the economic situation of farmers, remoteness and the type of product. For example, a local NGO would receive small or no additional financial support for the capacity building of nearby farmers with large surfaces and volumes, whereas the training of remote farmers with small surfaces and volumes would be compensated with higher project contributions. Overall, the project should concentrate its further support and outreach on the more disadvantaged farmers who have the potential for local market oriented production but are of secondary interest for the service providers and processors. At the same time, due to the higher profitability the local service providers are likely to do further outreach to bigger and advantaged farmers independently. The project should phase out the support to this target group.

3) **Enhance focus on migration**:
   The LMD project has the potential to mitigate or even reverse trends of young people emigrating from rural areas in search for work. Local market oriented vegetable and fruit production is highly profitable, and this study provides evidence that young LMD farmers are particularly successful in the production and marketing of these crops. In coming new phase, the project should put a special emphasis on including young people in LMD activities. LMD regions with high labor migration rates should be identified by means of analysis of project data and additional surveys, and efforts for the inclusion of young farmers should be particularly strengthened in these regions. Furthermore, local market oriented vegetable and fruit production may be a strategy to tackle labor migration in regions where the LMD project has not been active so far. Such additional outreach would require additional project funding. The collaboration or joint implementation of a new project component with national and international migration programs should be envisaged.

4) **Enhance focus on ecologically sound production**:

The project successfully introduced IPM standards at a broad scale. Buyers and consumers on the local market are increasingly demanding ecological and healthy fresh products. As IPM farmers still depend on certain amounts of costly chemical inputs that have potential harmful effects on soils and ecosystems, the project should strengthen its effort to promote ecological production methodologies. In the next phase, the project should promote organic farming practices as a promising option for LMD farmers. It is a proven fact that same or higher margins can be achieved through organic production, even if the product is sold without certification and at an only marginally higher price. The usually small surfaces required for vegetable production are particularly suitable for organic methods as the supply of organic manure in sufficient quantity is feasible, especially for farms where the fields are not too far from the house. As a first step a 2-year pilot with a limited number of farmers in several regions is recommended, taking the wealth of lessons learned from the organic value chain projects of Helvetas Swiss Intercooperation in Kyrgyzstan, Tajikistan and many other countries as a starting point. Based on first learning experiences, organic practices can then be promoted at a larger scale in LMD.

5) **Promote demand-oriented development and professional use of LMD database**

The comprehensive LDM database is a valuable resource that should be used and further developed along three main lines:

Firstly, a central objective of this impact study was to make evidence of the contribution of the project to farmer income by comparing income levels of LMD farmers with a significant control group. The study at hand failed to make such comparison due to the lack of a sizeable and representative control group. This remaining attribution gap needs to be filled urgently by establishing a yearly surveyed control group including non-LMD farmers from all districts where the project is active. Moreover, in order to allow for conclusive timeline comparison, the database should use individual identification numbers for each farmer.

Secondly, in order to ensure the institutional and economic sustainability of the database, it should be handed over to committed partners who are able to manage and further develop it with a commercial perspective. The Kyrgyz service provider AgroinformAsia and the Tajik partner AgroInform were identified as suitable partners. Crucial preconditions for the efficient and profitable use of the database are the development of demand-oriented service packages for different clients, the streamlining and harmonization of the data collection and transfer structure as outlined before, reducing the number of involved partners and systematically strengthening the statistical skills of the partner staff.

Secondly, within Helvetas Swiss Intercooperation and generally among project implementation agencies, a great variety of data management and monitoring systems can be observed. To a certain degree this is justified as each project has particular needs for information and accountability. However, one has the strong impression that the wheal has be re-invented many times and that mutual exchange and learning between programs is rather limited. The LMD project is one of the few good examples of very thorough and professional data management and monitoring, with a lot of experience in building up and analyzing an electronic database. Other projects should have access to this knowledge and receive the opportunity to learn from it. A systematic exchange in capacity buildings, workshops and via online platforms should be promoted and offered as service to partners and donors. A further interesting option is the comprehensive compilation of practices, methods and lessons learned of the LMD data management in written documents such as guidebooks or training tools, ideally in the framework of a more extensive learning exercise in collaboration with other programs who work on database management.

7. Annex

Annex 1 – Socio-economic figures of impact study

Annex I a)

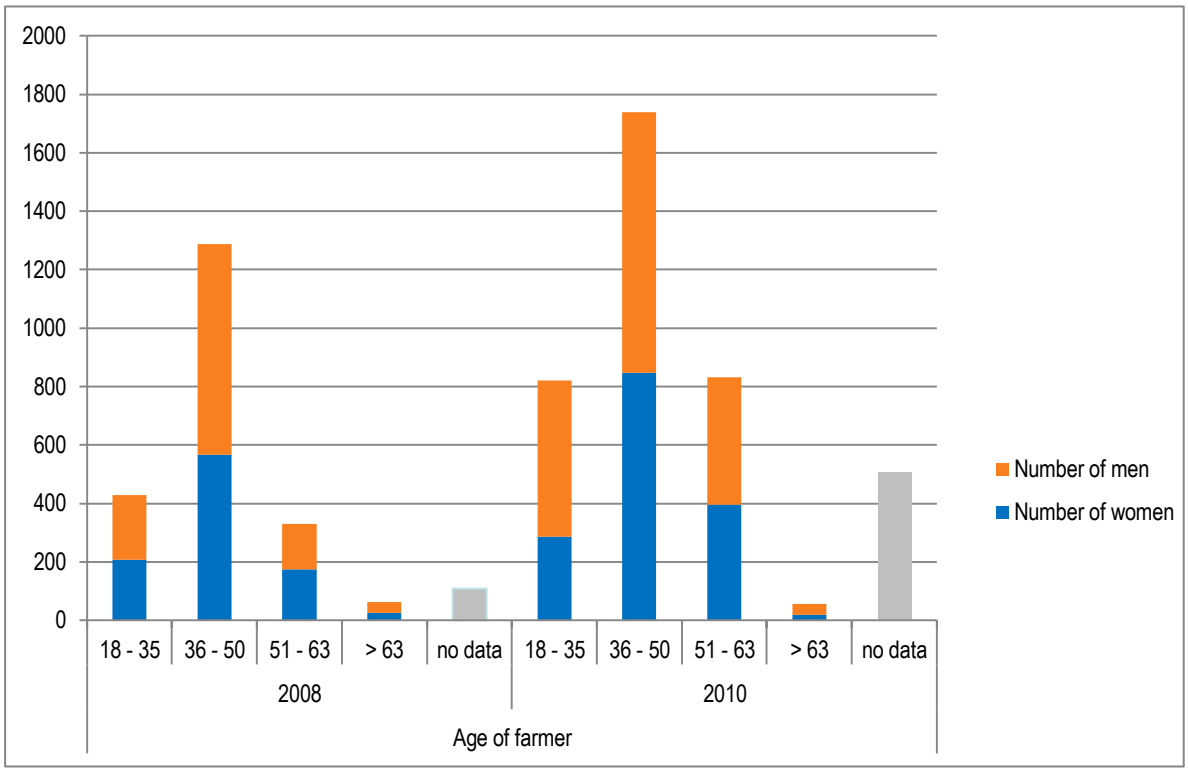


Figure 11: Number of LMD farmers according to age group and sex, Kyrgyzstan

Annex I b)

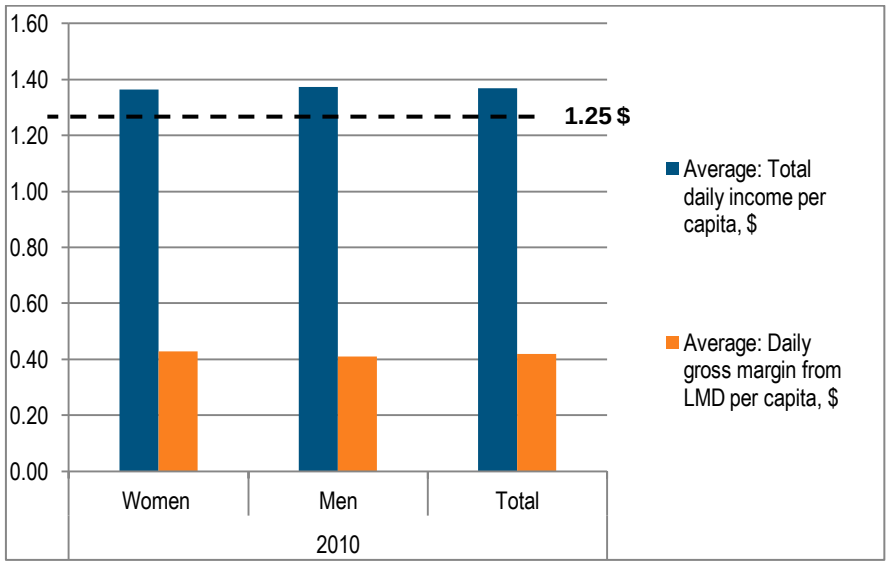


Figure 12: Average total income and margin from LMD activities, women and men, Kyrgyzstan

Annex I c)

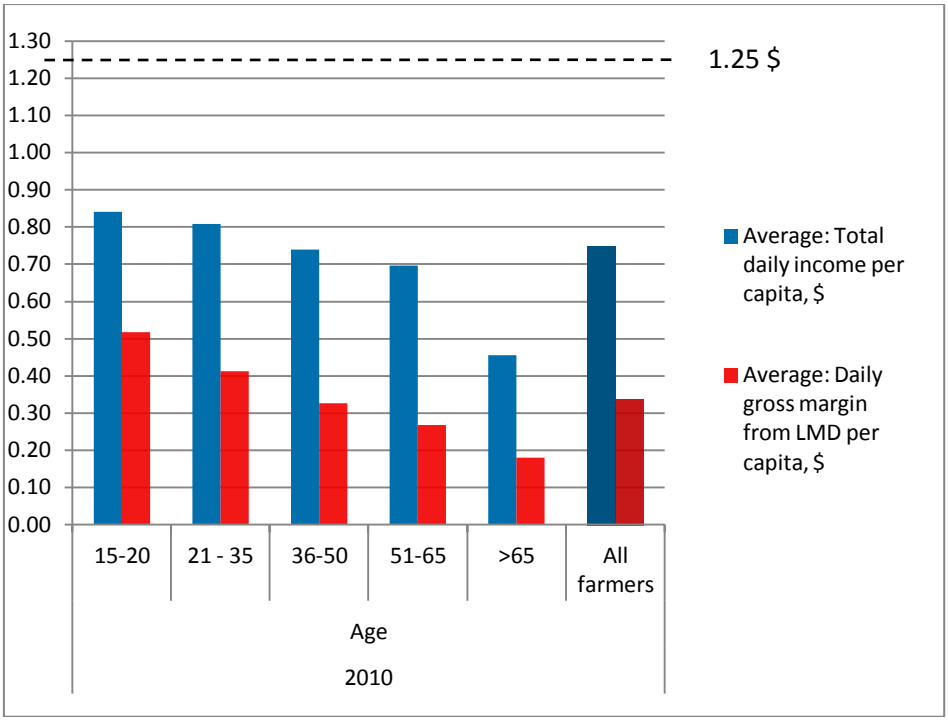


Figure 13: Daily income and gross margin from LMD activity per age group, Tajikistan

Annex I d)

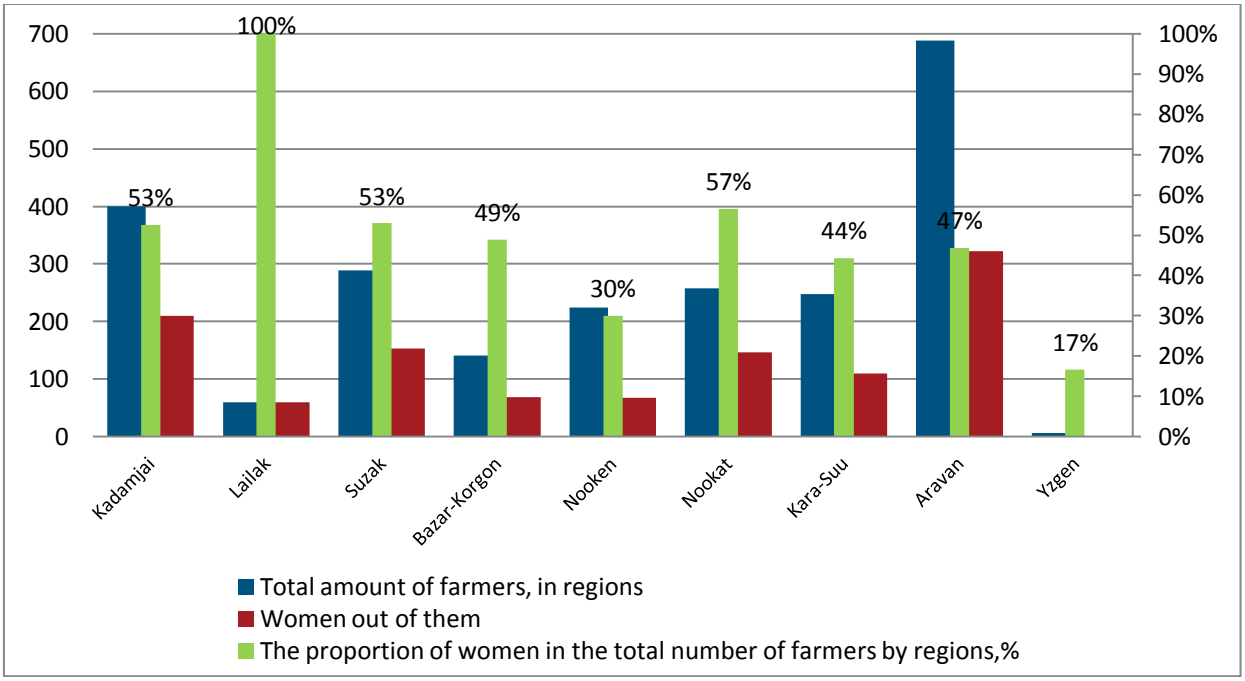


Figure 14: Number of LMD farmers, men/women by region, South of Kyrgyzstan

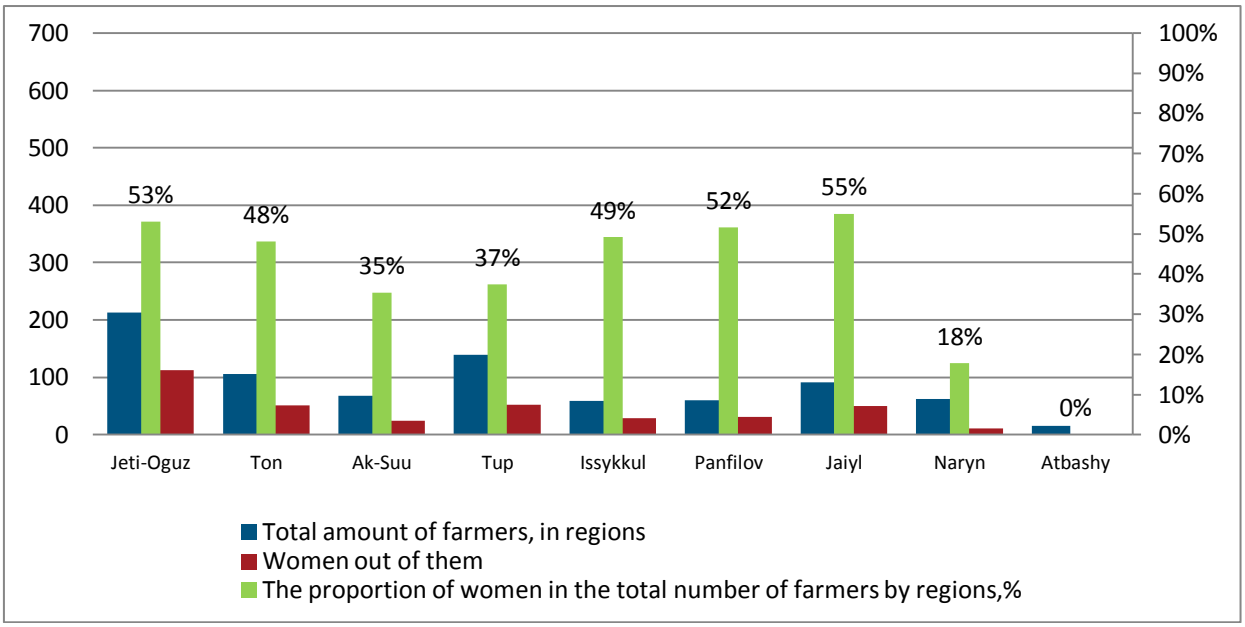


Figure 15: Number of LMD farmers, men/women by region, North of Kyrgyzstan

Annex I e)

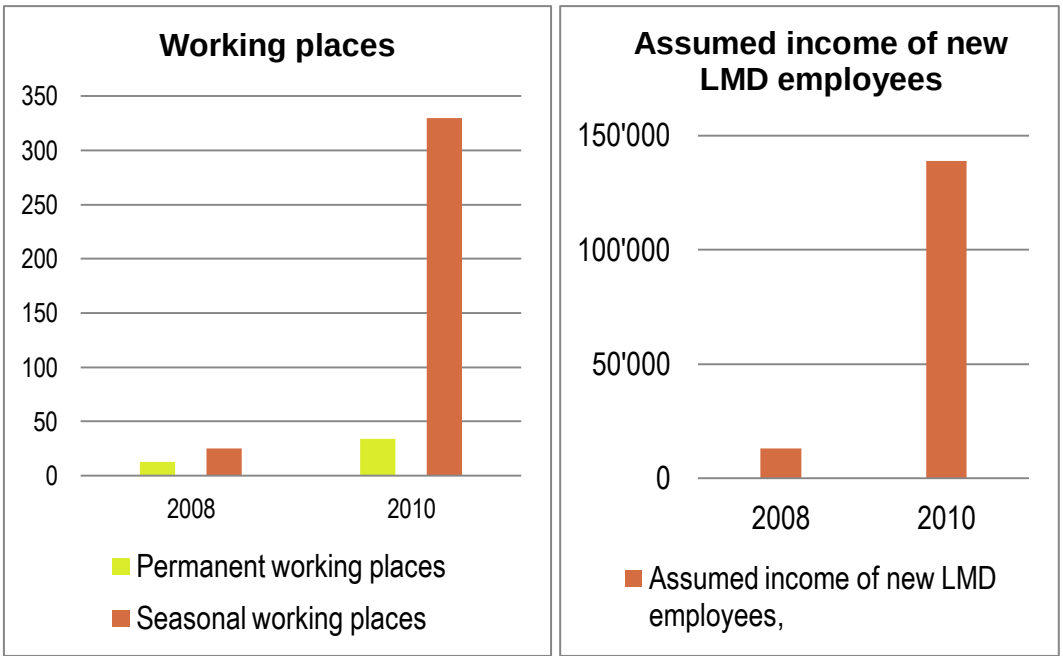


Figure 16: Income generated through job creation, LMD Kyrgyzstan

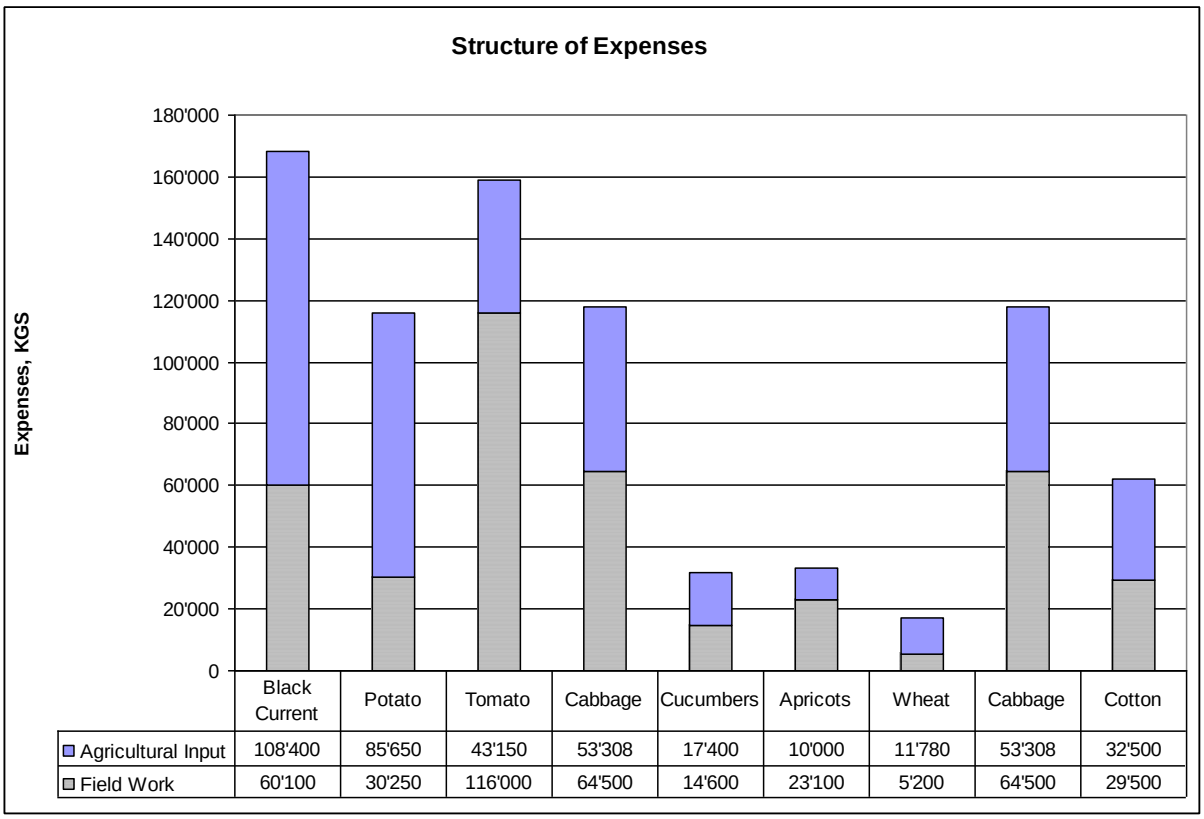
Annex 2 – Agronomic Statistics

Comparison of Crop Profitability

	Seeds	Organic Fertilizers	Mineral fertilizers	Chemicals	Other materials	Total Input (KGS)	Total input (US$)	% of Total Costs	Farmer work	Employed work	Mecha-nized work	Total Work	% of Total Costs	**Total Costs**
Black Current	75'000		20'000	9'000	4'400	108'400	2'409	64%		58'500	1'600	60'100	36%	**168'500**
Potato	57'600	10'000	8'000	550	9'500	85'650	1'903	74%	8'000	10'500	11'750	30'250	26%	**115'900**
Tomato	14'000	6'200	3'000	700	19'250	43'150	959	27%	0	114'000	2'000	116'000	73%	**159'150**
Cabbage		12'000	14'600	5'800	20'908	53'308	1'185	45%	27'000		37'500	64'500	55%	**117'808**
Cucumbers	2'610	4'000	1'900	390	8'500	17'400	387	54%	6'000	6'000	2'600	14'600	46%	**32'000**
Apricots		3'500	4'200	2'300		10'000	222	30%	23'100			23'100	70%	**33'100**
Wheat	2'500	3'200	2'100	1'960	2'020	11'780	262	69%			5'200	5'200	31%	**16'980**
Cotton	5'000	9'000	7'000	2'500	9'000	32'500	722	52%	22'300		7'200	29'500	48%	**62'000**

	Yield,kg/ha	Price, KGS/kg	Income	Profit (KGS)	Profit (US$)	ROI Return on Investment	Working Hours	Profit per 1 working h (KGS)	Profit per 1 working h (USD)
Black Current	12'000	45.00	540'000	371'500	**8'256**	3.20	1'320	281.44	**6.25**
Potato	25'000	6.00	150'000	34'100	**758**	1.29	475	71.79	**1.60**
Tomato	80'000	7.00	560'000	400'850	**8'908**	3.52	1'212	330.73	**7.35**
Cabbage	30'000	12.00	360'000	242'192	**5'382**	3.06	399	607.00	**13.49**
Cucumbers	25'000	8.00	208'967	176'967	**3'933**	6.53	408	433.74	**9.64**
Apricots	30'000	15.00	458'602	425'502	**9'456**	13.86	2'327	182.85	**4.06**
Wheat	3'000	8.00	24'000	7'020	**156**	1.41	1'868	3.76	**0.08**
Cotton	2'500	35.00	87'500	25'500	**567**	1.41	479	53.24	**1.18**
							Exchange rate	45	KGS/ USD

Structure of expenses for different crops



	Black Current	Potato	Tomato	Cabbage	Cucumbers	Apricots	Wheat	Cabbage	Cotton
Agricultural Input	108'400	85'650	43'150	53'308	17'400	10'000	11'780	53'308	32'500
Field Work	60'100	30'250	116'000	64'500	14'600	23'100	5'200	64'500	29'500

Figure 17: Structure of expenses for different crops

Production cost, income and working hour profitability

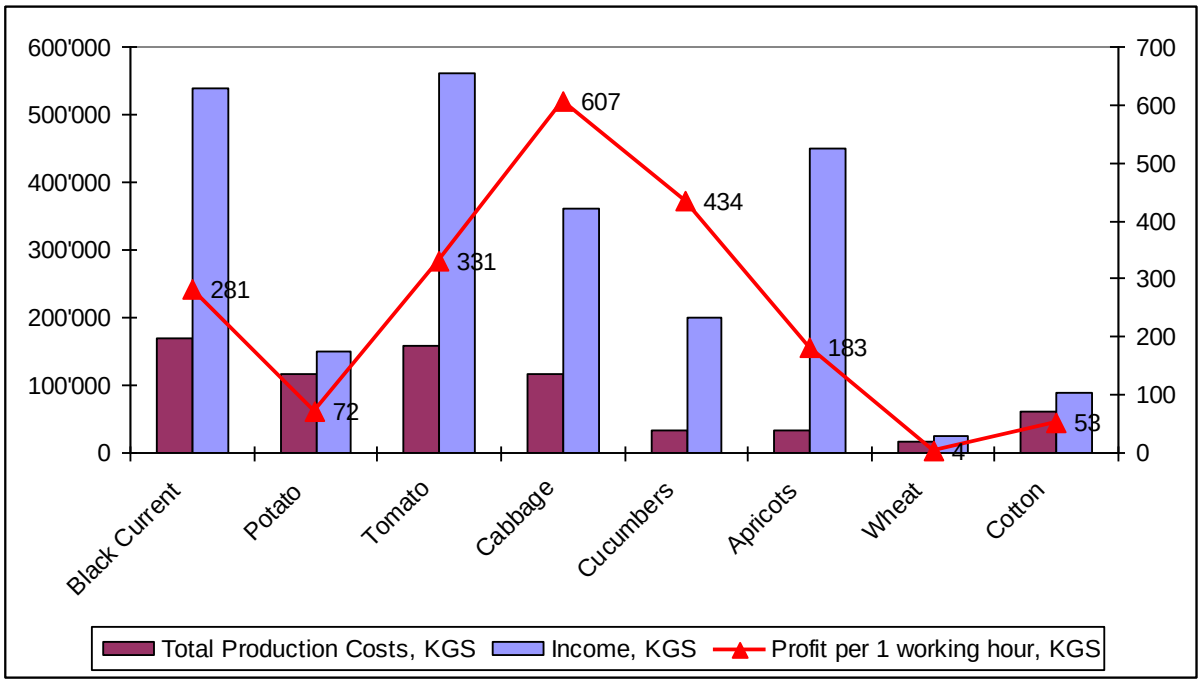


Figure 18: Production cost, income and working hour profitability

Annex 3 – Creation of Jobs through LMD project, Kyrgyzstan

Table 1: Working Places created by processing companies in 2008 (information was gathered in 2009)

Name of the company, country	New working places (seasonal) due to LMD work in 2008	Total number of new working places in 2008	Assumed income of new LMD employees, KGS
Dessert, KG	(10)	10	120 000[2]
Gulikuhsor, TA	4	25	46 080
Khamadoni, TA	4	4	48 000
Kulyab, TA	5	6	60 000
Muminobad, TA	(15)	5	180 000
Total:	**13 + (25)**	**50**	**454 080 (12 948 USD)**

Table 2: Working Places created by VCO and VCS in 2010

Name of the company, country	New working places due to LMD work in 2010 (seasonal)	Total number of new working places at the business in 2010	Assumed income of new LMD employees, KGS[3]
Dessert, KG	(30)	0	480 000
Kun-Tuu, KG	(21)	10	336 000
Baerkos, KG	(15)	3	240 000
Ailana, KG	(76)	25	1 216 000
Agroplast, KG	(58)	4	928 000
Sokoev, KG	(40)	0	640 000
Kooppromservice, KG	(20)	0	320 000
Kyrgyzstan, KG	(7)	0	112 000
EuM, KG	(18)	0	288 000
Agrolead, informal agricultural collection points net	4	4	64 000
CTCI, Network of the IPM trainers	30	30	1 680 000
Mirzoev, TA	(5)	5	80 000
Muminobad, TA	(6)	15	96 000
Total:	**34 + (330)**	**96**	**6 480 000 (138 812 USD)**

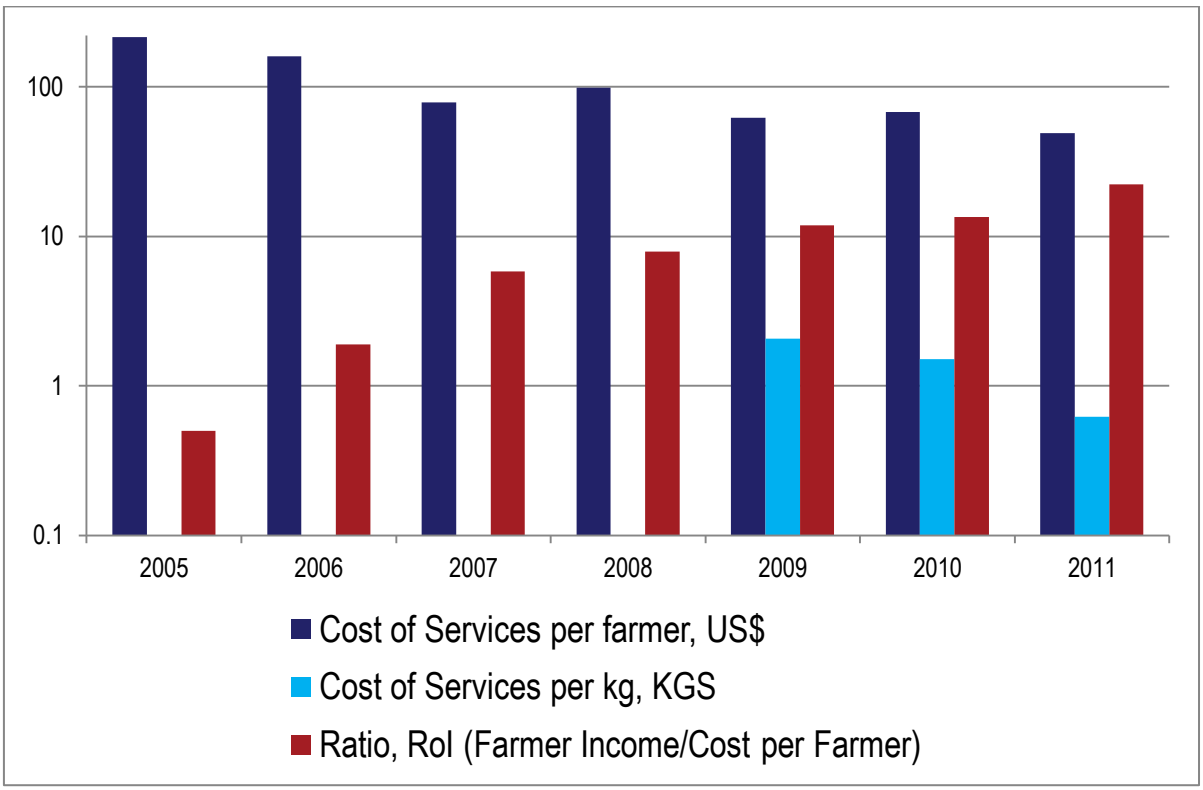
[2] Calculated as for seasonal workers for average duration of the season in 4 months and average monthly salary 3 000 KGS.

[3] Calculated as for seasonal workers for average duration of the season in 4 months and average monthly salary 4 000 KGS.

Annex 4 – Existing service provider in the frame of LMD, Kyrgyzstan 2011

Approach	Type of organisation	Name of the Organisation		
IPM / FFS	Local	1. Agrobilim 2. Agrolead 3. DCCA 4. COKI	5. RAS Batken 6. RAS Chu 7. RAS Jalal-Abad 8. RAS Issyk-Kul	9. Mehr-Shavkat 10. Tayan 11. Shoola
	International	1. Aga-Khan		
VCD / SSD	Local	1. Agrobilim 2. Agrolead 3. DCCA 4. COKI 5. RAS Batken	6. RAS Chu 7. RAS Jalal-Abad 8. RAS Issyk-Kul 9. Mehr-Shavkat 10. Tayan	11. Shoola 12. TES Centre 13. AFVPE 14. AESP
	International	1. Aga-Khan 2. GiZ		

Annex 5 – Cost of service per farmer



Annex 6 – Planned and Actual Production of vegetable, fruits and berries by farmers in Kyrgyzstan and Tajikistan, 2011

	Coun-try	Region	Number of FG	Number of Farmers	Land, ha	Planned Production, t	Actual production, t	Actual/ Planned, %
Tomatoes	KG	South	82	780	198	2 449	986	40
		North	10	150	59	1 400	1 238	88
		Total KG:	**92**	**930**	**257**	**3 849**	**2 224**	**58**
	TJ	North	39	577	146	1 681	1 459	87
		South	44	569	104	1 603	1 578	98
		Total TJ	83	1 236	264	3 284	3 037	92
		Total:	**175**	**2 166**	**521**	**7 133**	**5 261**	**74**
Cucumbers	KG	South	13	113	40	139	140	101
		North	10	150	63	623	465	75
		Total KG:	**23**	**263**	**103**	**762**	**605**	**88**
	TJ	North	8	125	7	100	100	100
		South	39	568	54	998	1 175	118
		Total TJ:	45	702	60	1 098	1 275	116
		Total:	**68**	**965**	**163**	**1 860**	**1 880**	101
Potatoes	KG	North	26	347	155	3 191	3 051	96
		South	6	73	31	500	794	159
		Total KG:	**32**	**420**	**186**	**3 691**	**3 845**	**104**
	TJ	South	24	393	45	765	906	118
		Total:	**56**	**813**	**231**	**4 456**	**4 751**	**107**
Maize	TJ	South	**3**	**71**	**25**	**200**	**216**	108
Cabbages	KG	North	**1**	**15**	**5**	**168**	**168**	100
		South	**4**	**34**	**15**	**680**	**740**	109
		Total KG:	**5**	**49**	**20**	**848**	**908**	**107**
	TJ	South	18	270	13	251	356	142
		Total:	**23**	**319**	**33**	**1 099**	**1 264**	**115**
Carrots	KG	South	1	15	5	20	20	100
	TJ	South	20	312	17	203	298	147
		Total:	**21**	**411**	**27**	**223**	**318**	**143**
Onion	KG	South	**3**	**64**	**34**	**895**	**850**	95
	TJ	South	**42**	**625**	**111**	**2 566**	**3 200**	125
		Total:	**45**	**689**	**145**	**3 461**	**4 050**	**117**
Raspberries	KG	South	1	7	1	15		0
		North	4	67	3	11		0
		Total:	**5**	**74**	**4**	**26**		0
Strawberry	TJ	**North**	4	84	3	7	7	100
Grape	TJ	**South**	10	153	60	161	153	95
		Total:	**14**	**237**	**63**	**168**	**160**	95
Apples	KG	**Total KG:**	3	36	17	230	230	100
	TJ	North	10	150	45	55	74	135
		Total:	**13**	**186**	**62**	**285**	**304**	107
Apricot	KG	**Total KG:**	**31**	**586**	**98**	**404**	**604**	**150**
	TJ	North	6	91	20	49	8	16
		South	3	56	4	10	34	340
		Total:	**40**	**733**	**122**	**463**	**646**	**140**
Lemon	TJ	South	**47**	**727**		**533**	**533**	100
Persimmon	TJ	South	**4**	**66**	**2**	**20**	**20**	100
Watermelon	TJ	South	**1**	**11**	**15**	**205**	**200**	98
		Total:	**52**	**804**	**17**	**758**	**753**	99
TOTAL PRODUCTION:			**512**		**1 388**	**19 932**	**19 387**	**97**

Annex 7 – Program of Learning Workshop – LMD project + DB management

Thursday 20 October 2011, Bishkek

Time	Topic	
09:00	**Welcome** Welcoming words and presentation of participants	RD
	PART 1 – Results of the Impact analysis	
09:10	**The LMD database** Purpose, planning and implementation process – Some lessons learned.	ER
09:25	**Presentation of preliminary results of impact analysis (part 1)** Objectives and methodology of impact study Results and findings of data analysis	ER, RD
10:10	**- Coffee Break -**	
10:30	**Presentation of preliminary results of impact analysis (part 2)** Results and findings of data analysis	ER, RD
11:10	**Discussion and validation of results** Do the results of the analysis correspond to experiences of partners? Missing aspects or insights?	RD
12:00	**Key learnings for the LMD project?** Main conclusions for the project? Achievements and challenges? Strategies and possible scenarios for the future?	ER
12:45	**- Lunch break -**	
	PART 2 – Use and further development of the LMD database	
13:30	**Introduction to Database management** Interest and purposes of a database Principles in the planning, implementation and use of databases	RD
13:45	**SWOT analysis of the LMD database** Strengths, opportunities, weaknesses and threats of the existing database? Main challenges?	RD
14:45	**Options to improve the functionality and use of database** How to adapt it more to the needs? Possibilities to make it simpler, more practical, more usable? How to define, share and hand over responsibilities in the DB management?	RD

Annex 8 – List of Participants of LMD Impact Analysis Learning Workshop

	Name	Organization
1	Christian Steiner	Helvetas
2	Eugene Ryazanov	Helvetas
3	Rafael Dischl	Helvetas
4	Kalybek Imashev	Helvetas
5	Tattybubu Shamieva	Helvetas
6	Jyldyz Abdyllaeva	Helvetas
7	Damira Raeva	GIZ Program on Sustainable Economic Development
8	Nazgul Asanova	GIZ Program on Sustainable Economic Development
9	Azamat Mukashev	GIZ Program on Sustainable Economic Development
10	Paul Forest	USAID Local Development Program
11	Begler Aslanov	USAID Local Development Program
12	Joomart Jumabaev	Chui Talas RAS
13	Kadyrbek Kachkinbaev	Jalalabat RAS
14	Abdipata Matoev	Batken RAS
15	Elisabeth Katz	Chui RAS
16	Ksenia Zinchuk	AgroinformAsia
17	Vladislav Ryazanov	AgroinformAsia
18	Kayirkul Kazylaeva	AgroLead
19	Elena Chigibaeva	AgroLead
20	Guye Laurant	SDC
21	Tunjurbek Kudabaev	SDC
22	Nurbek Okishev	TSOKI