EFFECTIVENESS OF THE RURAL ADVISORY SERVICES (RAS)

Highlights from an assessment of the outcomes of RAS services in the farmers' fields and pockets

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HELVETAS Swiss Intercooperation | KYRGYZSTAN

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Contents

Acronyms and abbreviations

GoKR	Government of the Kyrgyz Republic
Helvetas	Swiss Association for International Co-operation
IFAD	International Fund for Agricultural Development
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IK	Issyk Kul Oblast or Issyk Kul RAS
IPM	Integrated Production Management
JA	Jalalabad Oblast or Jalalabad RAS
KR	Kyrgyz Republic
KSAP	Kyrgyz-Swiss Agricultural Programme
MOA	Ministry of Agriculture of the Kyrgyz Republic
RAS	Rural Advisory Services (six regional Public Foundations)
ROI	Return on Investment
SDC	Swiss Agency for Development and Co-operation
Sotka	Locally used (Russian) area measurement (100 Sotka = 1 ha)
TAIC	Training, Advisory and Innovation Centre
USAID	United States Agency for International Development
WB	World Bank

1 Introduction

1.1 Why a RAS outcome assessment?

The Rural Advisory Services (RAS) have been working now for over ten years in the whole territory of the Kyrgyz Republic and in Naryn for 15 years (see 2.2 for more information about the RAS). During the whole lifetime of the RAS, diverse efforts to document results of their work have been undertaken, but never any systematic and thorough assessment of the results at outcome or impact level. The regular monitoring conducted was focusing much on immediate outputs and only to a very limited extent on outcomes. There is much anecdotal evidence of the benefits that farmers derive from advisory services; however, there are also voices doubting the effectiveness of the RAS' services. Until now it was difficult to provide independent evidence concerning the effectiveness of the Rural Advisory Service system to policy makers and donors, and even more difficult to provide quantitative data on its effectiveness.

In 2010 the Kyrgyz-Swiss Agricultural Program (KSAP) therefore conducted an assessment of the effectiveness of RAS services in terms of outcomes in the farmers' fields, herds and household economies. This paper presents highlights from this outcome assessment.

Note that we are of the view that the results of this outcome assessment are not only valid for the RAS and their clients, but that it can be assumed that also the other qualified advisory service providers in the KR are similarly effective for their clients.

1.2 About the Rural Advisory Services (RAS)

The Rural Advisory Services (RAS) are a network of six independent Public Foundations (Batken, Chui-Talas, Issyk Kul, Jalalabad, Naryn, Osh). Apart from RAS Naryn (initiated in 1995) Batken (2002), they were established in 1999 on a joint initiative of the Government of the Kyrgyz Republic, the Government of Switzerland, the World Bank (WB) and the International Fund for Agricultural Development (IFAD). The RAS operate in the whole territory of the Kyrgyz Republic. They have advisers in every Raion of the country (mostly with an office) and regional offices in all Oblast Centres.

The RAS support rural people through providing know-how, facilitating processes and building up links to other relevant players (e.g. markets, credit) required for more productive and profitable farm and other small-scale rural enterprises. The topics of RAS services are very wide – virtually all locally relevant crops and livestock types, soil and water management, pasture management, small-scale processing (fruits and vegetables, milk, wool and hides), establishment and management of small businesses and income generating activities, business planning and credit access, improved marketing of farm produce, establishment of local service providers (e.g. Community Seed Funds, Artificial Insemination and veterinary points, agro-vet shops, machinery services) etc. The RAS work in a participatory, interactive and practical way. The RAS use an array of methodologies such as individual and group consultations, practical and theoretical trainings, demonstrations, participatory experimentation and innovation development, Farmer Field Schools and facilitating experience exchange between clients. They also regularly publish their own newspapers, and use TV, radio and other information channels to disseminate information among the rural population.

The services of the RAS are to a large extent financed through mandates from different donors. Currently (2010) around 60% of the annual turnover is provided through the World Bank-financed Agricultural Investment and Services Project (AISP). In 2010 the RAS concluded for the first time a mandate contract with the Ministry of Agriculture (co-financed by the Swiss Government). In addition, farmers and private commercial entities contribute to RAS turnover in the form of fees for services. From 1999 until 2010, a substantial part of the RAS operations and capacity building were financed by the Swiss Government, through the Kyrgyz Swiss Agricultural Program (KSAP), in partnership with the World Bank.

2 Executive Summary

2.1 The impact of advisory services on profitability of small farms in Kyrgyzstan

"Our advice is your success!" This is the slogan of the Rural Advisory Services (RAS) in the Kyrgyz Republic. The Rural Advisory Services have been built up by the Kyrgyz Swiss Agricultural Program (KSAP; funded by the Government of Switzerland and implemented by Helvetas) together with a range of partners over more than 10 years. An assessment of the outcomes of the RAS' services conducted in 2010 showed that the slogan is not empty publicity, but that the advisory services help rural people really to increase productivity and profitability of their farms. RAS clients for example nearly doubled their potato yields, and increased their wheat yields to over 80% above the national statistical average. Women who changed to special egg breed chicken with RAS support nearly tripled their profits from poultry. They not only managed to increase egg productivity by nearly 30%, but due to the confidence gained from RAS training, more than doubled the number of chicken they keep.

2.2 Context

After the collapse of the Soviet Union in 1991, in the Kyrgyz Republic (KR) large collective farms were converted into numerous small family farms. People, who had previously been tractor drivers, teachers, accountants or yardmen, now had to survive on their own production. Agricultural productivity rapidly decreased in the first half of the 1990ies, with a parallel increase in poverty.

Against this backdrop, SDC (Swiss Agency for Development and Cooperation) through a mandate to Helvetas – in 1994 initiated the Rural Advisory Services (RAS) in Naryn, a mountainous remote region of the KR. In 1999, the Rural Advisory Services were expanded to all regions of the country, in partnership with the World Bank, the Government of the Kyrgyz Republic and others. The partners invested in intensive capacity and institution building and as well financed to a large extent the provision of advisory services.

Today, a network of six regional RAS operates in the whole territory of the Kyrgyz Republic with field advisers in each of the 40 Raions (districts). They support rural people through providing know-how, facilitating processes and building up links to other relevant players (e.g. markets, credit) required for more productive and profitable farm and other small-scale rural enterprises. The topics of RAS services are very wide – virtually all locally relevant crops and livestock types, soil and water management, pasture management, small-scale processing (fruits and vegetables, milk, wool and hides), establishment and management of small businesses and income generating activities, business planning and credit access, improved marketing of farm produce, establishment of local service providers (e.g. Community Seed Funds and private seed farms, Artificial Insemination and veterinary points, agrovet shops, machinery services) etc.

There has been much anecdotal evidence of the benefits that farmers derive from the services of the RAS, and it can be assumed that the services contributed to the recovery of the agricultural sector in the country (averaging 3% annual growth since 1999). The findings of an assessment of the effectiveness of RAS services in terms of outcomes in the farmers' fields, stables and households conducted in 2010, now document the progress in farm productivity and profitability resulting from RAS services.

2.3 Outcome assessment approach

- The focus was placed on results which are directly attributable to RAS services, such as yields and profits.
- Interviews with nearly 800 farmers of 70 villages in five of the seven regions of the country were conducted. Of these approx. halves were women and half men.
- RAS clients as well as farmers who did not get any services were included in the interviews.

- Complementary control data (national statistics, data collected by other programs) were used to assess whether the information collected during the interviews is realistic.

The outcome assessment was conducted by a team consisting of an international consultant, independent local consultants and Helvetas staff members.

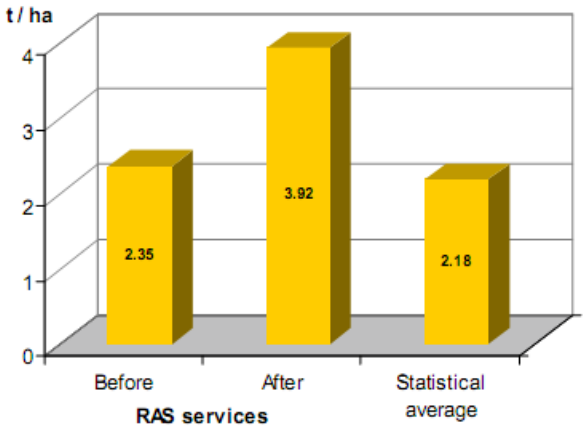
2.4 RAS services are highly valued and result in real

Farmers apply knowledge gained from RAS services and consider the services highly useful. 99% of the interviewed RAS clients reported that they apply what they learn from RAS. 70% rate the services of the RAS as highly useful and nearly 30% as fairly useful; less than 1% finds them not useful.

RAS clients are more successful in improving their farms. Over the last 10 years, many farmers in Kyrgyzstan were able to improve their farming operations. However, RAS clients experienced more improvements in terms of profitability, as well as productivity of livestock and crops, than their fellow farmers who do not use RAS services. The majority of RAS clients who received services in several areas increased the overall profits from their farms by 25 to 100%.

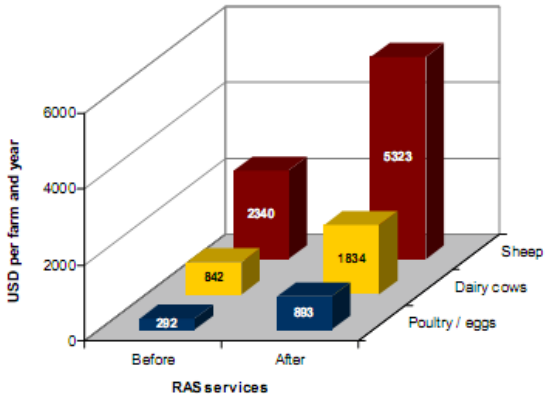
Contribution to food security. Wheat is one of the crucial crops for food security in Kyrgyzstan. RAS clients increased their wheat yields on average by two thirds from 2.3 to 3.9 t/ha (compared to the national average of 2.2 t/ha). Kyrgyzstan imports between around 20 and 40% of its annual wheat requirements. If the RAS recommendations were applied to 60% of the wheat cultivation area in the country, the production would equate food sufficiency. RAS services thus would constitute an effective instrument to achieve food security policy goals.

2.5 Effect of RAS services on wheat yields in comparison with average yield



Confidence in livestock management results in higher productivity and numbers of animals. Kyrgyzstan is to a large extent mountainous and a livestock country. Its sheep population is higher than the human population. Livestock is a key element of nearly every household economy. The interviewed RAS clients could more than double, and in the case of poultry even triple the profits from animals. The increase in profits comes from a productivity increase by around 1/3, and from more than doubling the number of animals kept.

2.6 Effect of RAS services on profits from livestock



RAS services are not only effective, but generate also a high return on investment. Based on the additional profits generated by the main RAS services and the costs of providing these services, the Return on Investment, i.e. the value generated in the farmers' pockets per USD invested in RAS services was roughly estimated:

ROI of main RAS services:
23.5 USD per USD invested

Comparative data from other sources are rare. However, it can be safely said that such a ROI is remarkable, and at the higher end of the values available from other studies.

2.7 Key achievements

The Rural Advisory Services of the Kyrgyz Republic achieved the following:

- “Creation” of a new function and profession in the rural knowledge system of the Kyrgyz Republic “rural advisor”.
- Intensive capacity building of all levels of staff of the
- RAS from field advisers to managers and steering bodies, including around 350 field advisors.
- Introduction of advanced agricultural practices and new types of rural businesses to Kyrgyzstan.
- Coverage of over 70% of all communes and over 50% of all villages.
- Trained on average 55’000 people per year – in total during 10 years nearly 560’000.
- Reached over 10 years an estimated 30% of all farms and had in total around 50’000 permanent clients (nearly 20% of farms).

3 Approach and methodology

3.1 Focus on outcomes, not impact

Whenever designing assessments of results of development work, the question arises, what results exactly to look at? Which kind of results can be attributed to the work of a program or an organisation? As for impact there are notoriously more external than internal influences, the credible attribution to a program's own work is usually difficult. To avoid such an attribution gap – are changes in the farmers lives in the last few years the result of RAS services or of general developments in the KR - for this assessment it was consciously decided to concentrate on outcomes which can with a high degree of confidence be directly attributed to services of the RAS, e.g. yield and income/profit increases in farm branches on which the farm obtained services.

3.2 Data collection

The core of the outcome assessment was a survey with individual farmers - RAS clients and farmers who never got any RAS services (non-clients) in three of the seven Oblasts of the Kyrgyz Republic. In addition in two Oblasts groups established by the RAS were surveyed.

Data were collected through structured interviews with qualitative and quantitative questions. The information collected included:

- Overall changes in productivity and profitability of farms
- RAS services received, application of knowledge gained from services, benefits from and overall utility of services
- Changes in yields, income and profits after receiving services for around 10 most important services in a region
- Sustainability groups, group activities, credit received, etc.

The following remarks concerning the interviews are important to keep in mind:

- Regarding yield data, the farmers were explicitly asked for averages over the years in order to minimize effects of special years (climate, price fluctuations etc.).
- Farmers were only asked about their production, the area under a crop respectively the number of animals kept before and after RAS services and the price of the product. Yields per ha, income and profits were then calculated.
- Production expenditures were collected from knowledgeable farmers in Jalalabad, from RAS advisers and taken from secondary information sources (see below), and profits calculated using these as approximation for the farmers' production cost.
- Quantitative questions about specific services were only applied with farmers which showed fairly good awareness about his/her production and economic figures, as the first tests showed that it is not possible to get credible yield figures from a large part of the farmers.
- It turned out that it was even more difficult to find non-clients, who can provide realistic and credible quantitative information on their yields.

3.3 Locations and time of surveys

Interviews with individual farmers were conducted in three Oblasts - Chui, Naryn and Jalalabad. Originally it was foreseen to include Batken as a second Oblast in the South, but due to the Osh events and the national elections in 2010, the available time was finally short.

In each of the Oblasts two Raions and in these 7-8 villages each were selected. As first Raion in each of the Oblasts the one in which the earlier RAS village surveys (see annex 1) took place, was selected. As a second Raion, one that represents a different agro-ecological zone of the respective Oblast, was chosen.

Interviews with members of groups established by the RAS were conducted in two additional Oblasts (Issyk Kul, Talas), again in two Raions each.

Villages were selected, in which RAS has been working intensively and since long (more than five years).

In total nearly 800 farmers were interviewed (51% women, 49% men).

The following table provides an overview of the interview locations:

Oblast	**Raions**	**Villages**
Chui (JUN 2010)	Jaiyl (western Chui, not too close to Bishkek, agriculture highly important)	Vosnesenovka, Orto Suu, Poltavka, Kaiyrma, Alexeevka, Chong Aryk, Cheken, Erik Tuu
	Kemin (eastern Chui, more mountainous, agriculture highly important)	Kaiyndy, Saman Suu, Beisheke, Kichi Kemin, Shabdan, Almaluu, Samansur, Chymkorgon
Naryn (AUG 2010)	Ak Talaa (remote, altitude around 1600 m a.s.l.)	Baigonchok, Ugut, Baetov, Ak Tal, Togolok Moldo, Kurtka, Cholok Kaiyn
	At Bashy (remote, high altitude 2400 m a.s.l.)	Taldy Suu, Ak Jar, Acha Kaiyndy, Ozgorush, Ak Myz, Ak Moyun, Birlik, At Bashy
Jalalabad (SEP 2010)	Ala Buka (remote, hilly)	Ala Buka, Dostuk, Sary Talaa, Kosh Terek, Ysar, Kosh Almurut, Safed Bulan, Madaniat
	Nooken (Fergana plains + adjacent hills)	Burgondu, Kyzyl Tuu, Shamaldi Say, Kyla, Komintern, Kurulush, Shaidan, Birlik
Issyk Kul (OCT 2010)	Issyk Kul (Northern lake shore, many RAS groups)	Jety-Oguz, Jele-Dobo, Tilekmat, Otochor, Saruu, Jengish, Tosor, Kichi-Jargylchak, Oruktu, Chong Oruktu
	Jety Oguz (Southern lake shore, many RAS groups)	Kashat, Temir, Jarkinbaev, Semionovka, Ornok, Toru Aygyr
Talas (OCT 2010)	Kara Buura	Moldosan, Chong Dobo, Amanbaev, Kara Suu
	Talas	Kum Aryk, Kosuchak, Kok Oy, Kosh Kashat, Sasyk Bulak

3.4 Selection of interviewees

Originally it was planned to select clients and non-clients for interviews randomly. However, the testing of the questionnaires revealed that only few farmers are able to provide credible and reliable information on their figures concerning production and economics. Therefore, the RAS were asked to prepare lists with clients in the villages selected for the survey, whom they consider having a good understanding of the quantitative characteristics of specific branches of their farms. From these lists then randomly farmers were selected for interviewing; farmers who could not be found, were replaced by the next one on the list.

In addition to the clients pointed out by the RAS advisers, in Naryn and Jalalabad clients were selected for interview on an opportunity basis on the spot by the interview teams. After concluding an interview, other clients in the neighbourhood were asked for an interview. Non-clients were identified in the same opportunity-based way.

Around two thirds of the interviewed clients were pointed out by RAS advisers based on the criterion of good awareness of their production and economic figures. The remaining third was identified on the spot.

For the interviews with groups, the respective RAS provided a list with all the groups it established in the selected Raions. From this list, the groups to be interviewed were to be selected randomly. However, as for some groups no members could be found, selection was ultimately more on an opportunity than a real random basis.

3.5 Number of people interviewed

In total almost 800 people were interviewed (51% women, 49% men). The following table provides an overview on where how many persons of which category were interviewed.

No. of people interviewed						
	Chui	**Naryn**	**JA**	**IK**	**Talas**	**TOTAL**
Selected clients (pointed out by RAS)	151	115	69			**335**
Non-selected clients (identified on the spot)		115	60			**175**
Group clients				61	56	**117**
Total individual clients	**151**	**230**	**129**			**510**
Non-clients	54	69	46			**169**
Individual + group clients						**627**
GRAND TOTAL	**205**	**299**	**175**	**61**	**56**	**796**

3.6 Contributors to the Outcome Assessment

The following actors contributed to the RAS Outcome Assessment:

Survey design and elaboration of questionnaires	International consultant (Dr. Itil Asmon), KSAP
Interviews for data collection	Independent local consultants (drawn partly from the pool of external monitors trained for KSAP monitoring of the RAS mandate), three KSAP team members
Organisation of surveys (support in selection of villages, organising village visit, links to knowledgeable clients)	Concerned RAS
Production economic estimates for cross-checking of information from interviews	Advisers of RAS Chui and Jalalabad
Preparatory and complementary data	All RAS

compilation (information about RAS services and successful businesses)	
Data analysis and synthesis, document compilation	International consultant, KSAP

3.7 Data analysis

The data were analysed through simple formulas. No formal statistical tests were sensible, as the data sets per crop/livestock enterprise are too small (sometimes only 10-20 sets), and the variability of the data is high.

In the quantitative analyses, non-credible data sets were excluded, e.g. yield increases of over 250% (in some cases also above 100%), unrealistically high yields after services, unrealistically low yields before services. Doubtful data sets were included or excluded on the basis that this decision was towards a less positive outcome. In this way care was taken to counter the risk of a bias towards better outcomes that came with the need to interview farmers, which are aware of their production and economic figures.

3.8 Complementary data from other sources

To complement or cross-check data obtained during the outcome assessment, data from some other sources were used:

Source	**Use**
Economic analyses from the TAIC IPM/FFS program under AISP and LMD (potato, tomato, wheat)	Estimates and cross-check of production cost and productivity for the respective crops and livestock types
Economic analyses from the AISP TAIC livestock FFS program (cattle, sheep, poultry)	
Collection of cases on farm economic analysis (by AgroLead)	
Economic analysis for various crops from the Local Market Development project of Helvetas	
National statistics of the KR	Average yields for crops per Oblast, number of farms in the country and per Oblast
KSAP repeated village surveys 1999-2007	Awareness of farmers about RAS
RAS key indicators (2002-2009)	Data about RAS client numbers
Adding Value in Agriculture. By Evgeniy Ryazanov. Helvetas/ICCO 2007	Cross-check of production cost and profitability for diverse crops
Returns to spending on agricultural extension: the case of the NAADS program of Uganda. By Samuel Benin et al., Agricultural Economics 42 (2011)	Comparison of Return on Investments
A Meta-Analysis of Rates of Return to Agricultural R&D. Alston et al., IFPRI (International Food Policy Research Institute), 2000	
Economic Impact Assessment of the Pakistan Initiative for Strategic Development and Competitiveness. USAID Pakistan, 2008	
Dr. Bayish Dardanov, professor on livestock and veterinary science, Bishkek (personal communication), 2011	Information on productivity of poultry under different conditions as basis for cross-checking of survey results

4 Overall insights and conclusions

4.1 Effectiveness of RAS services

Based on the current study it can be concluded that the services of the RAS are highly effective, cost-efficient and generate substantial added value.

Yield and profit increases

The impression one gets, when talking to RAS clients in villages concerning their satisfaction with RAS services, is confirmed by the survey results. The services are highly beneficial for the clients in terms of yields and profits. The RAS' own estimate of a 25-30% increase in productivity resulting from their services is more than confirmed – in many cases the average increases reported by farmers are substantially higher. For example, the surveyed RAS clients increased the profits from potatoes on average by 94% (see section 6.1.2). Wheat yields increased from approximately the national statistical average to 3.9 t/ha (section 6.2.1) and sugar beet yields to 35 t/ha (section 6.3.1). Women clients earned with around 60 egg-breed chickens more than a full teachers salary (section 8.2.1). The value of sheep herds in Naryn increased 2.5 fold as a result of the introduction of meat breed animals into herds (section 8.1.1).

Further, the survey results are average figures – extraordinarily good farmers achieve substantially higher benefits from RAS services.

Cost-efficiency

RAS services are also cost-efficient; they are estimated to have had a remarkably high return on investment of 24 KGS return in farmers pockets for every KGS cost of advisory services (across all the assessed services).

Additional value generated

Every provided RAS service (on crops and livestock) created on average nearly 50000 KGS additional profit per client farm per year. Given the average number of clients served per year of 24000, and under the assumption that only 75% of the clients got additional profits out of the services (not all services create as much additional profits as the typical crop and livestock services), RAS services generated every year on average 875 million KGS or around 19 million USD additional value. This is nearly 1% of the average agricultural GDP of KR over the last five years (2005-09). Considering the average growth rate of agricultural GDP of 3% per year over the past 10 years, the estimated additional value generated from RAS services is very significant.

The above calculations take into consideration only the monetary value. Yet, the RAS' clients gain also many important non-monetary benefits from the services. Section 10 of this assessment, for example, documents the benefits of groups established with RAS support – the key ones being collaboration and joint problem solving, learning from each other, and the availability of financial reserves through internal savings and credit schemes.

Dependence of profitability on market prices

On the other hand it has to be noted that the profits of farming, and consequently the effectiveness of RAS services, are highly dependent on the ratio of market prices for produce and inputs. When product prices get very low, as for example from 2009 onwards for wheat and in 2011 for potatoes, the profitability of these crops becomes disappointingly low for farmers. However, even with low prices, profits with the improved practices promoted by RAS advisers are normally higher than with conventional practices. But farmers do not view the additional efforts as justified, if the additional

profits to be gained are low. RAS services can through farm and gross margin analyses assist farmers in taking economically rational decisions on their product mix under different price expectations.

4.2 Advisory services as a policy instrument

Policy relevance of RAS services

The outcome assessment documents that with the right knowledge and the willingness to work hard, rural citizens in the Kyrgyz Republic can earn a decent living based on agriculture. Although advisory services alone are not sufficient to enable farmers to unlock the potential of agriculture in Kyrgyzstan, they are an essential element of any policy aiming at enhancing the productivity and profitability of agriculture. Without the knowledge provided to farmers through advisory services, public investments in seeds, other agricultural materials, low interest credit and other subsidies, in irrigation infrastructure, and even in agricultural machinery, are largely ineffective.

RAS services contribute to promoting a range of policy goals of the government of the Kyrgyz Republic, in particular concerning food security, poverty reduction and ecologically clean production. For example the RAS provide farmers with the know-how required to manage soil fertility in a sustainable way, and to introduce integrated pest and disease management. Through RAS services farmers increase productivity and profitability of food security relevant crops and livestock products, such as wheat, potato, sugar beet, eggs, milk and meat. Further RAS services contribute to changing farmers' perception of farming from "farming is a way of life" and "I farm because I cannot find another job" towards farming "farming is a business". RAS services have an obvious poverty reducing effect. With advisory programs targeting specifically young farmers, the RAS could also help to give life perspectives in rural areas for young people, and in this way encourage some of them to remain there instead of migrating to cities or abroad.

Public investments in rural advisory services as a policy instrument

As this assessment shows, advisory services are an indispensable agricultural policy instrument. Therefore, it is justified to invest public finance in rural people's access to advisory services. A vast majority of governments around the world – in well off as well as not so well off countries - do this in one or the other way. The notion that farmers, in particular small farmers, pay the full costs of advisory services in a country like the Kyrgyz Republic, is an illusion.

At this point in time more than 90% of all advisory services provided in the Kyrgyz Republic are financed through donor-supported projects. Farmers and private sector actors (processors, traders, micro-finance agencies) contribute to financing of services to an extent that varies between service providers. While payment for services from private sector actors has the potential to be enhanced, this is not expected to be sufficient to ensure the advisory services required to support the realisation of the government's agrarian policies are provided.

Therefore, the Government of the Kyrgyz Republic, as part of its agrarian sector policy needs to invest in advisory services. Given the existing set-up, it can do this most efficiently through public-private partnerships with RAS and other existing providers of advisory services[1]. Based on the defined policy goals and related government strategies, RAS and others can be mandated to provide the services required to achieve these goals and implement the government's strategies.

[1] In the early years of the new millenium, the government decided together with the concerned donors to build up an advisory service system outside the government structures. With the RAS and a number of other advisory service providers, which emerged in the past years, after ten years of capacity building support this system is now effectively operating. To build up advisory capacity within the government structures, would require another 10 years of capacity building investments and possibly outcompete the existing service providers. Therefore it is much more cost-efficient for the government to work in partnership with the existing providers.

Government investment in advisory services will enhance the effectiveness of all other investments in the agricultural sector. For example, in many countries, access to agricultural loans is compulsorily linked to training about the farm branch for which the credit is taken. The results of the government's low-interest credits for farmers in the Kyrgyz Republic could certainly be enhanced, if the recipients of these credits would have to undergo a RAS training as a condition for obtaining such credit.

4.3 Validity and limitations of the assessment

4.3.1 Validity of assessment results

Although it turned out to be difficult to get an exact quantification of outcomes (see the limitations below), the large number of interviewed farmers who reported massive increases in productivity and profitability, and rate the RAS services as very useful, show without doubt that the assessment results reflect an approximately right picture. Even if the actual increases would be somewhat lower than the survey figures, the survey results definitively show what a motivated farmer with average abilities can get out of RAS services.

Attribution

In outcome and impact assessments, it is often difficult to attribute the changes experienced by the target group to the assessed development program. By focusing on the direct results of services for the farmers and a comparison of these results with the statistical averages, the attribution gap is not of any concern in this assessment. The interviewed farmers directly attribute much of the improvements in productivity and profitability of their farms to RAS services.

4.3.2 Limitations

Accuracy of data

Overall we do not know how accurate the productivity figures given by the interviewees are. A range of factors contributes to some uncertainty concerning the accuracy of the data collected for the assessment:

- The majority of farmers do not keep production and marketing records, and are overall little aware about quantitative data of their farm operations. Many of the interviewees were unable (or unwilling) to give figures, and a substantial part of the data collected was incomplete or not credible, and had to be discarded. Therefore, for many of the analysed RAS services the number of more or less reliable data sets is small.
- Although the interviewees were explicitly asked to give average productivity, area under a crop, livestock heads and prices before and after RAS services, we do not know how accurate their estimates are. As a result of climate variability and price fluctuations between years, yields and farm profits are very variable. In particular the "after" figures are likely to be influenced by the farm results of the last couple of years. In 2009 agricultural productivity in the KR overall was above average, as the water and climatic conditions were fairly good, while the two years before 2007 and in particular 2008, productivity was below average in many areas, due to near drought conditions.
- The production costs used to calculate profits were taken from secondary sources. Consequently, the variability of production costs between farmers is not reflected in the profit calculations.

All these uncertainties mean that the quantitative results on productivity and profitability have to be considered as estimates and not as exact data.

Selection bias?

The need for clients who can provide reliable quantitative information may have resulted in some bias towards “good” clients for the quantitative part of the interviews, who are able to utilise the RAS services for positive change in their farms better than others. Such a possible bias was countered by (1) not excluding data of farmers with reduction in productivity, even if they at the same time rated the service as highly useful (likely error in data recording), and by (2) stringently excluding unrealistically high outcome data after RAS services and rather leniently dealing with unrealistically low data.

On the other hand, the surveys had to be carried out during the agricultural season. As reported by RAS and villagers themselves, the best, most motivated and knowledgeable RAS clients were sometimes not available for interview (e.g. in Naryn the most advanced and knowledgeable livestock farmers were on the summer pastures).

Non-clients were interviewed concerning specific crops or livestock, only if they reported to have introduced a clear change during the last ten years. And it was even more difficult to find non-clients with reasonable understanding of their quantitative farm data, than clients. For this reason the number of data sets from non-clients is mostly small, and there is likely a substantial bias towards "good" non-client farmers. This has to be considered in the comparison of the outcomes of RAS clients and non-clients. In consequence, the clients' yield data were compared also or only with statistical data as a proxy for non-clients, rather than with actual non-client data.

In conclusion it can be safely assumed that the probability of a bias towards too good quantitative outcomes for specific services, which is so high that it questions the validity of the assessment, is minimal.

Outcomes of services not included in the assessment

A range of RAS services were not included in the assessment, as surveys – due to limitations in time and resources - concentrated on the most important ones. Among these are the promotion of income generation for women groups and the establishment of small rural businesses (e.g. preservation of vegetables and fruits, village bakeries, dairy processing, shyrdak making, national handicrafts, skin processing, tailoring shops). As clients involved in such businesses are mostly enthusiastic, it is very likely that these activities are also very profitable. It is therefore recommended, that the RAS contract an assessment to get a quantitative understanding of the outcomes of these businesses.

5 Overall changes in farming success

5.1 Changes in productivity and profitability

> ▶ **RAS clients experienced more positive changes in productivity and profitability of their farms than farmers who did not use RAS services**

Nearly 600 interviewees in Chui, Naryn and Jalalabad Oblasts (510 RAS clients and 170 non-clients) were asked whether the productivity of their crops and livestock and the profits of their farm decreased or increased over the last 10 years. The answers show that RAS clients in all three Oblasts and for all three aspects report better results than non-clients (see fig. 1):

- the highest number of clients as well as non-clients report that they experienced a fair improvement of productivity as well as profits,
- substantially more clients than non-clients are of the view that their productivity and profitability has increased substantially,
- substantially more non-clients than clients report no change or a decrease in productivity and profitability.

In a large number of cases, the causes for the positive changes given by the interviewees are directly connected with the RAS services they received (e.g. adoption of new variety and quality seed, introduction of crop rotation, new sheep breed, better livestock feeding, more attention to animal health management, improved cultivation practices). Interestingly, few respondents gave external factors such as higher prices or better access to inputs and similar factors, although the respective question was formulated in a way that they should be encouraged to think about external factors. A substantial percentage of respondents mentioned directly RAS advice as reasons for improvements, although they interviewers were instructed to tell the interviewees that we are looking for the concrete changes, which had influenced their farm operations over the years.

Figure 1a: Changes in crop productivity

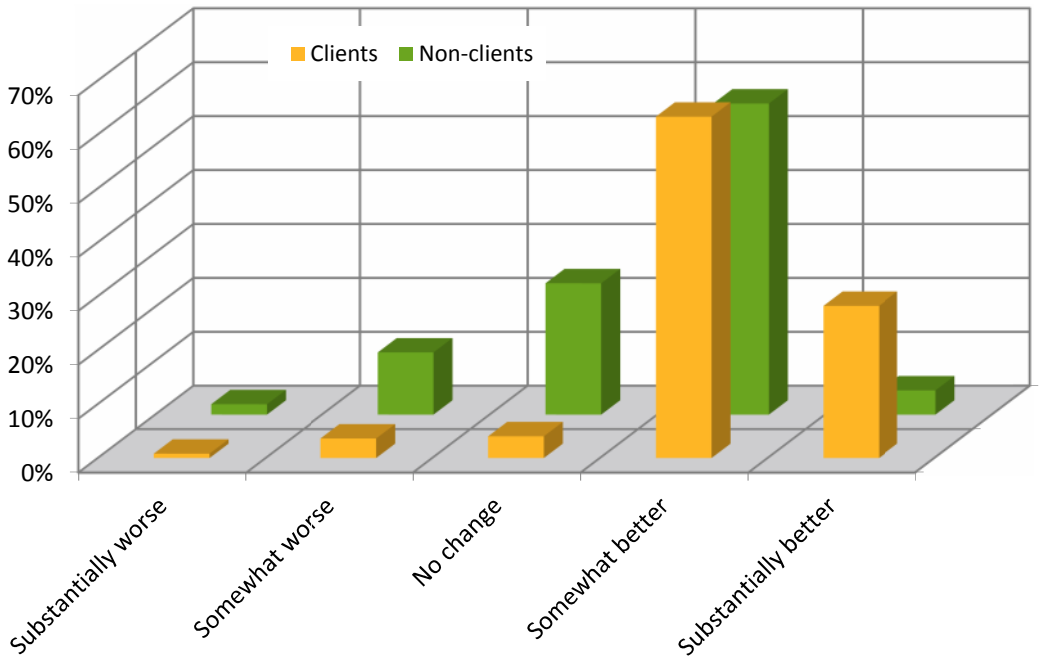


Figure 1b: Changes in livestock productivity

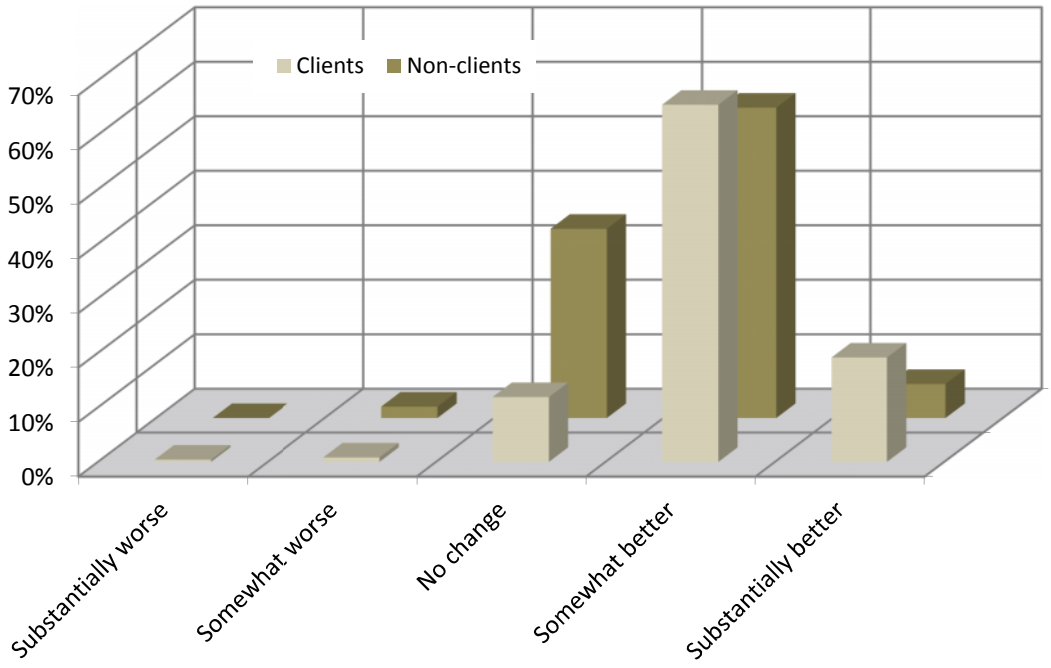
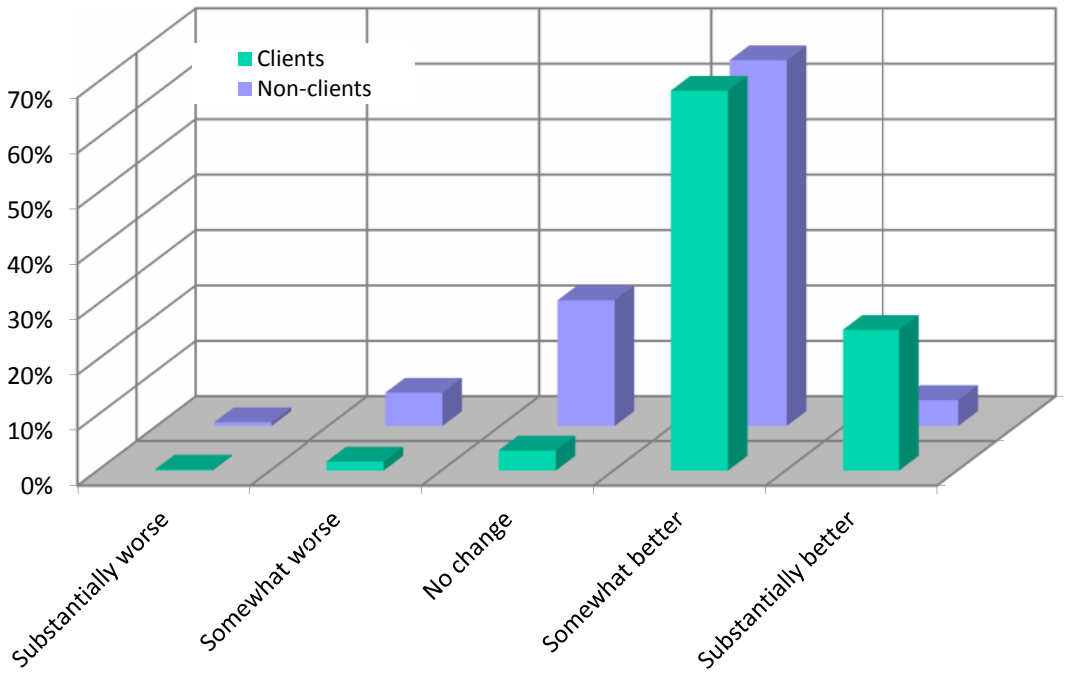


Figure 1c: Changes in farm profitability



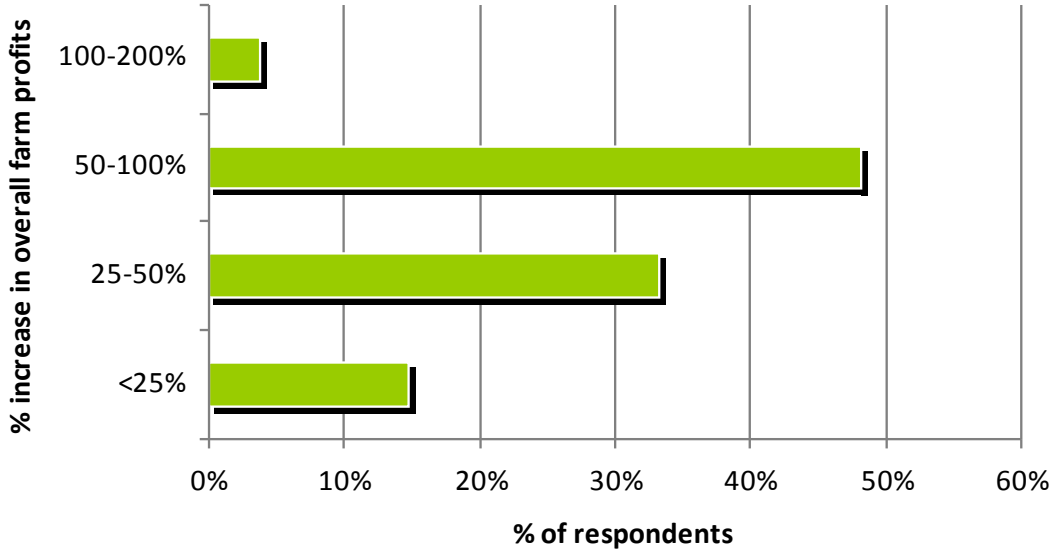
5.2 Impact of RAS services on farm profitability

- **The majority of the farmers who used RAS services for several farm branches achieved an increase in farm profitability between 25 and 100%.**
- **Nearly all clients perceive RAS services as having a medium or substantial influence on farm profits.**

5.2.1 Quantitative estimate

27 RAS clients, who received RAS services in at least five different topics, were asked about the changes in overall farm profitability as a result of these services. The graphic below shows that nearly half of them estimate that their profits increased by 50-100% and another third by 25-50%.

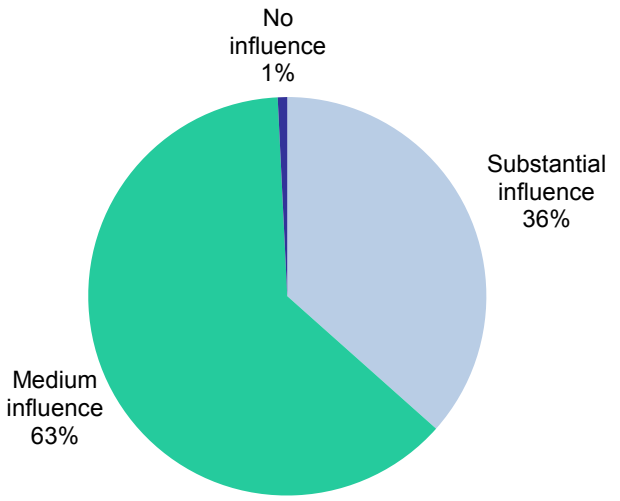
Figure 2. Effect of RAS services on overall farm profits (quantitative estimate; n= 29)



5.2.2 Qualitative perception on influence of RAS services on profits

All interviewees were asked whether the RAS services had an influence on the profitability of their farms. Nearly 2/3 of the respondents consider that RAS services had a medium influence on their farm profits and more than 1/3 say that the services had a substantial influence on profits. Less than 1% experienced no influence on profits.

Fig. 3. Influence of RAS services on farm profits



6 Effect of RAS services on crop yields and profitability

6.1 Potato[1]

- As a result of RAS services, clients could nearly double their potato yields from well below the statistical average (9.7 t/ha) to well above it (18.8 t/ha). The interviewed non-clients barely managed to reach the statistical average.
- RAS clients nearly doubled the profitability of their potato crops to over 100'000 KGS/ha. The most successful RAS clients achieve yields of far over 30 t/ha and profits of over 400'000 KGS/ha.

Potato is the most important crop in the higher lying areas of the Kyrgyz Republic, i.e. in whole of Naryn and Issyk Kul Oblasts and in the areas above around 1400 m in all other Oblasts. With appropriate production practices it can also be a profitable cash crop for local urban markets as well as for export to Kazakhstan and Russia. Potatoes also represent a key staple food for people in all mountainous areas in the country, and is highly important for food security at country as well as household level. In line with the importance of potato for the farm economy, potato is for RAS in all regions one of the most important service topics.

6.1.1 Yields

Figure 4 shows that RAS clients in Naryn and Chui could almost double their potato yields after RAS services from close to 10 to nearly 19 tons per ha on average (n=56 before services and n=62 after services). The average potato yield 2005-2009 as per national statistics is 15.1 t/ha. The RAS clients managed therefore to raise their yields from below to well above the average in both Oblasts.

Some non-clients also introduced changes in their production (mostly change of seed), which resulted in yield increase, but they remain below the level of the clients – an increase of 50% from close to 10 to 14.5 t/ha (n=14 and n=15), which is just about the statistical average.

Figure 4. Potato yields of RAS clients

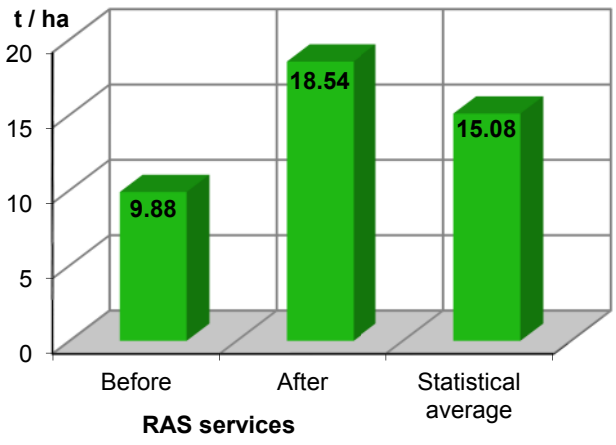
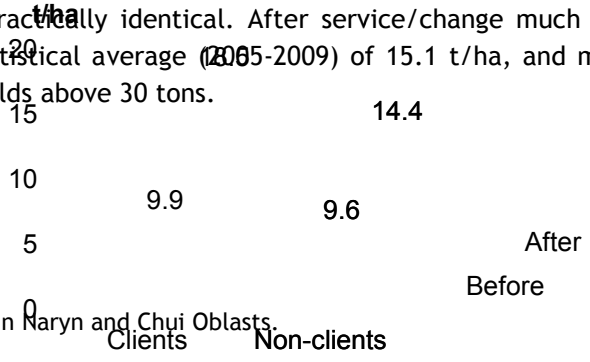
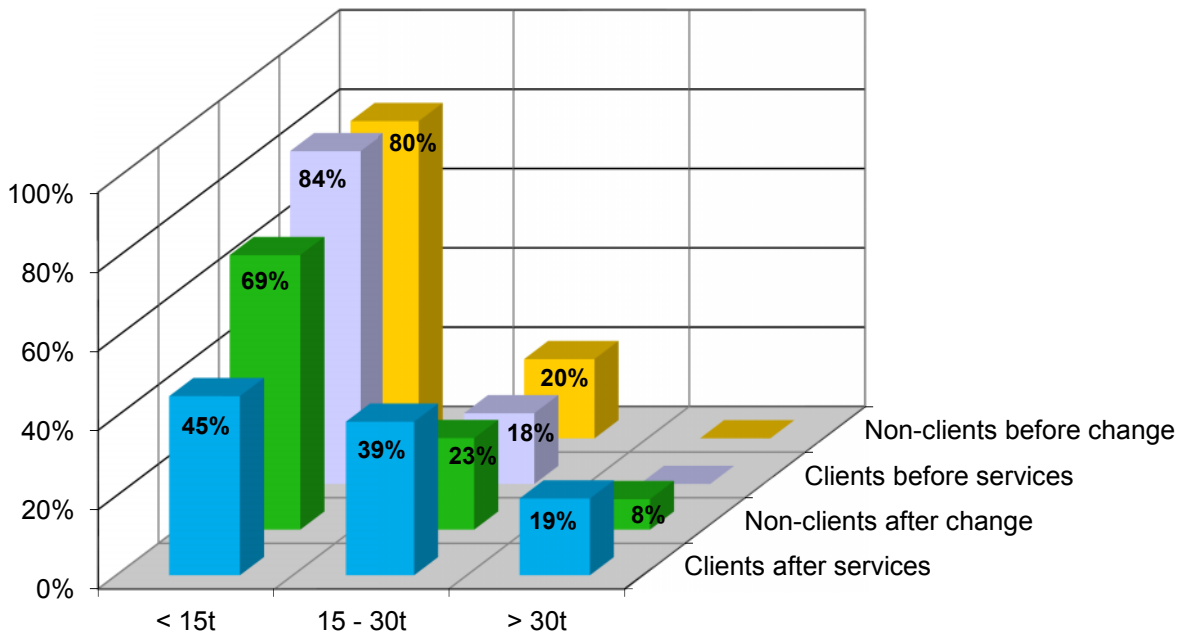


Figure 5 shows the percentage of clients and non-clients achieving different yield categories before and after RAS services, respectively the adoption of a change. Before services/change the percentages in each category for clients and non-clients were practically identical. After service/change much less clients than non-clients have yields below the statistical average (2005-2009) of 15.1 t/ha, and more than double as many clients as non-clients have yields above 30 tons.



[1] The data in this section are from the surveyed villages in Naryn and Chui Oblasts.

Fig. 5. Potato yield categories (t/ha)

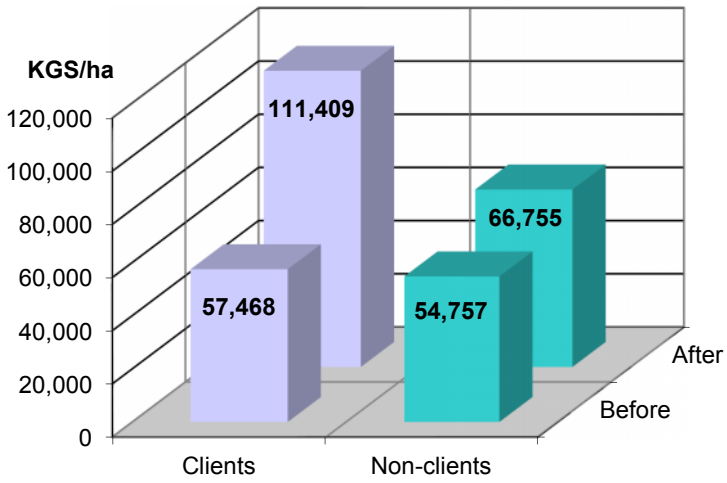


It is evident that the RAS clients achieve better results in potato cultivation than the average potato farmer in the country and the interviewed non-clients. However, also after RAS services a not unsubstantial part of the clients have below average yields, and some even below 10 t/ha. Possible explanations are that a part of the rather small-scale RAS farmers are unable to invest in adequate fertilisation, or that some of the interviewed clients follow RAS recommendations insufficiently, or grow potato on unsuitable land, or grow it on small plots in home gardens where land size is not a limiting factor.

6.1.2 Profitability of potato

The profits[1] from 1 ha of potato crop for clients on average nearly doubled (+94%), while the changes adopted by non-clients resulted in an increase of profits by 22%. After RAS services the clients achieved over 100'000 KGS profit per ha on average (fig. 6). The most successful RAS clients are getting profits of over 400'000 KGS per ha with yields of over 30 t/ha.

Fig. 6. Profits from potatoes



[1] Note that the profit calculations have to be viewed as approximations; the production costs are from secondary sources, and a small number of farmers and some RAS advisers, because only few interviewees gave complete production cost figures.

6.1.3 Area under potato

The RAS clients reported to have increased the area on which they grow potato by 80% from 15 to 27 Sotka[1] in Naryn and by 60% from 56 to 90 Sotka in Chui. The non-clients reported a slight decrease in their potato area. The increase of area with the RAS clients indicates that potato became a more attractive crop with the improvements achieved through RAS services.

6.1.4 Changes introduced

The clients achieved their yield increase in the following ways: 45% changed the overall cropping practices, 83% introduced a new variety or quality seed, 26% started to use mineral fertiliser. Other changes mentioned are the use of organic fertiliser and new marketing practices.

The following table shows the main combinations of changes and the average yields achieved with these changes:

Combinations of changes adopted	% of respondents (n=74)	Average yields after RAS services (t/ha)
Change of seed + change in cropping practices	39%	21.6
Change of seed only	35%	15.5
Change of cropping practices only	26%	18.8

The average yields in relation to the adopted changes need to be viewed with some caution as the differences are not statistically significant. Nevertheless, the figures indicate that change to quality seed without improving cultivation practices does not result in yields above the statistical average. This highlights the importance of the advanced knowledge which farmers gain through RAS services in addition to access to improved seeds.

The non-clients achieved their increase by changing to a new variety or to quality seed (which also may include a change in variety). Most of them report to have got the know-how and the improved seed potatoes from other farmers in the village, not specifying whether these were RAS clients or not. In the survey villages in Naryn, where a large part of the villagers are RAS clients, it is very likely that the yield increases of non-clients are also to at least some extent results of RAS work. In the Chui villages, which are larger, a smaller proportion of the villagers are RAS clients; therefore RAS influence on yields of non-clients is less certain.

6.1.5 Assessment of service utility

Around 35% of the interviewed clients obtained RAS services on potato in Naryn as well as in Chui. 76% of the potato clients in Naryn and 80% in Chui consider this service among the most useful services they received from RAS. The main reasons given for the utility of the service were yield and profit increases, availability of potato for home consumption and use as cash crop.

6.1.6 Policy implications of outcomes of potato service

The GoKR views potato as one of the key crops for food security at the country level. With RAS services, the productivity, as well as the profits per land area, substantially higher than the average in the country. Thus, with investments in advisory services, the productivity, as well as profitability, of potatoes evidently can be substantially increased.

[1] 100 Sotka = 1 ha

Many agricultural sector actors complain that potato yields in many places of the country are decreasing because of soil fertility depletion and increases in pest and disease pressure (oral communication with farmers and government officials). As per statistics though, potato yields in Naryn have not changed over the last years, although there is some fluctuation between years. RAS Naryn provided potato services to around 7400 clients over the 10-year period from 1999 until 2008; this is around 15% of all farms in Naryn Oblast (under the assumption that from a number farms more than one person received the service). With this level of coverage, it appears that RAS services on potato in Naryn may have counteracted a statistically visible general decrease in potato productivity over the years. This means that with investments, which allow high coverage of farms with services on particular topics, RAS services can have an impact on farm productivity that is perceived not only at the level of individual farms, but has a measurable effect on developments (growth or counteraction of decline) in specific agricultural sectors.

6.2 Wheat[1]

- As result of RAS services the yield of RAS clients increased by 67% on average.
- The share of yields of RAS clients above the statistical average increased from 44% to 92%.

Wheat is one of the crucial crops for food security in the Kyrgyz Republic. The country is normally not self-sufficient and has to import annually between 200000 and 400000 tons of wheat. Price fluctuations between years influenced by wheat supply in other countries make it in some years very profitable, while in other years the price barely covers production cost. For this reason some farmers are rather hesitant to invest in more productivity of wheat. Chui Oblast is by far the most important wheat growing area with around 35% of the total area under wheat.

6.2.1 Yields

The interviewed RAS clients achieved an average increase in wheat yields after RAS services of 70% in Chui and in Jalalabad of 40%. The average yield of all interviewed clients in Chui, Jalalabad and Issyk Kul (n=25) were 2.35 t/ha before and 3.92 t/ha after RAS services. The average wheat yield from 2005 to 2009 as per official statistics was approx. 2.2 t/ha. The RAS clients had slightly above average yields before they got services and achieve now yields much above the average.

The interviewed non-clients (Chui and Jalalabad; n=10) increased their yields from 2.3 to 3.4 t/ha after introducing some changes – half a ton below the RAS clients. 50% of the non-clients, who mentioned from where they got new knowledge and seeds, explicitly stated RAS clients as source. The interviewed non-clients achieve wheat yields substantially above the average; they therefore do not seem to be average Kyrgyz farmers. This reflects the fact that farmers, which were aware of their yield figures, were selected for interview.

Fig. 8 illustrates the shift in % of respondents to higher yields after receiving RAS services. After RAS services only 8% of the clients still have below average yields, in comparison with over 55% before RAS services. The percentage of yields above 3 and 4 tons per ha increased drastically after RAS services.

Fig. 7. Wheat yields of RAS clients

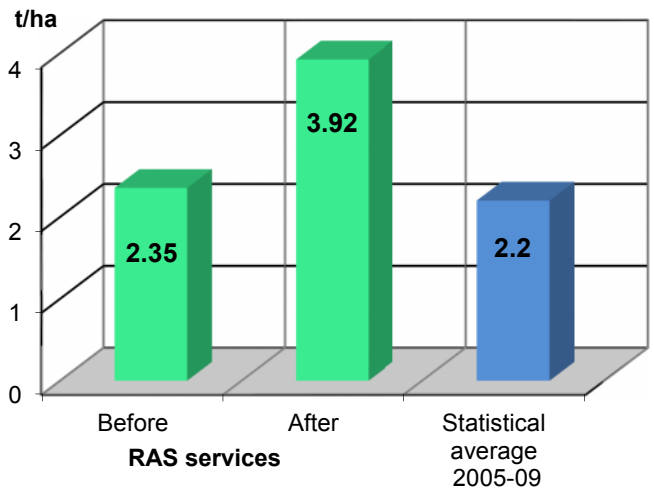
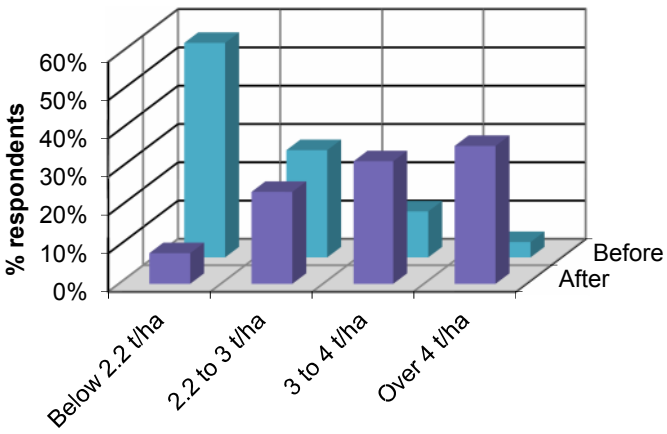


Fig. 8. Yield categories before and after RAS services



[1] The data in this section are from the surveyed villages in Chui, Jalalabad and Issyk Kul Oblasts. The majority of respondents are from Chui.

6.2.2 Wheat yields in context of food security

In Kyrgyzstan the average area planted with wheat over the last 5 years was approx. 400'000 ha. If on half of this area the yields would reach the level of the average RAS client instead of the current average of 2.2 t/ha, Kyrgyzstan could produce over 1.2 million tons of wheat, which is according to the Ministry of Agriculture the level required for self-sufficiency of the country. These calculations provide an indication about the importance of advisory services as an instrument to achieve policy goals of the KR. Further, the RAS also have the know-how on the production of wheat with bread wheat characteristics, i.e. they could help in enabling Kyrgyzstan to substitute imports of bread wheat from Kazakhstan with local production.

Area planted with wheat (ha)	**Average yield (t/ha)**	**Total production (t)**
200 000	2.2 (national average)	440 000
200 000	3.9 (average of RAS clients)	780 000
400 000	**---**	**1 220 000**

6.3 Sugar beet [1]

- After obtaining RAS services, RAS clients increased their sugar beet yield by 89% on average, from 18.6 t/ha (statistical average 17.7) to 35.1 t/ha. In view of the importance the GOKR gives to sugar beet, RAS services are also for sugar beet a relevant policy instrument.
- Application of cropping practices recommended by RAS alone, without introduction of quality seed, results in a yield increase of 70%; although this is less increase than with quality seed and improved practices, this highlights once more the importance of advisory services.

Sugar beet is grown mainly in Chui Oblast, where also the sugar mills of the Kyrgyz Republic are located. Further, sugar beet in grown in Talas on a small percentage of the total sugar beet area; the production from Talas can be transported by railway to the mills in Chui Oblast.

The Government of Kyrgyzstan determined sugar beet as one of those crops it wants to promote in order to improve food security and reduce dependence on imports. With the recent increase of sugar prices in the global markets, local production of sugar may be economically viable, although substantial investment in modernising the sugar mills is required.

6.3.1 Yield

Figure 9 shows that RAS services on sugar beet resulted in an average yield increase from 18.6 to 35.1 tons/ha (+89%) for the clients (n=19). Before RAS services the clients reached approximately the average from 2005-2007 (no data for 2008/9) given by official statistics, of 17.7 tons/ha. After services their yields are far above this average. None of the interviewed non-RAS clients provided data on sugar beet, so no comparison between clients and non-clients can be made.

91% of the respondents changed their overall production practices, 48% changed production practices and as well introduced improved seed. Change of production practices only resulted in 71% yield increase, while better production practices + improved seed resulted in 92%

Fig. 9. Sugar beet yields before and after RAS services

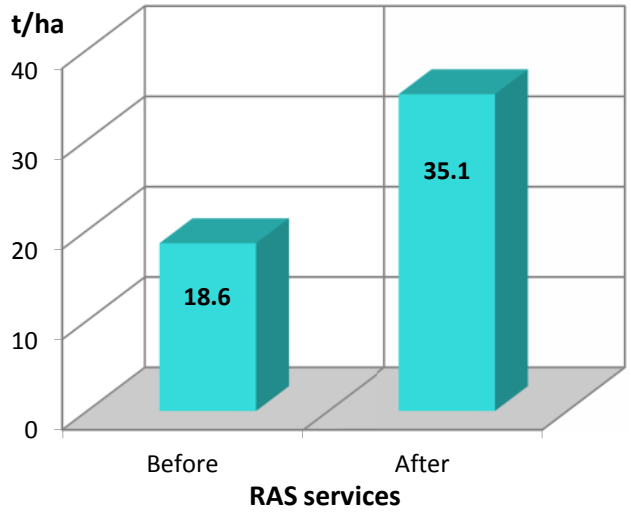
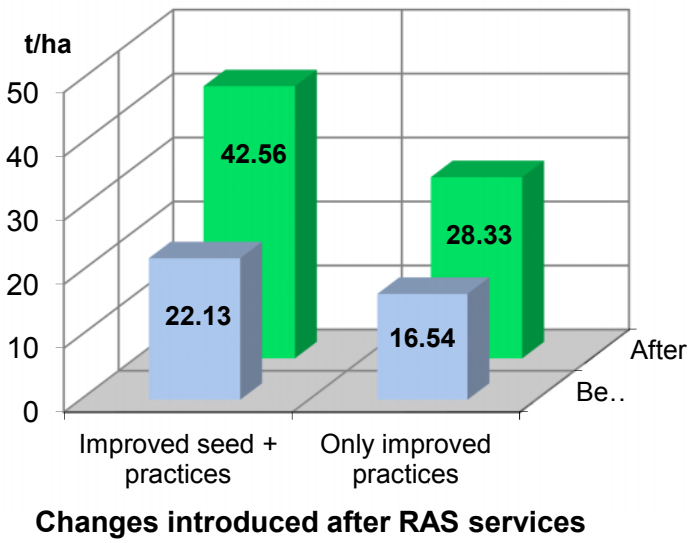


Fig. 10. Sugar beet yields in relation to changes introduced



[1] The sugar beet data are all from Chui Oblast.

yield increase (see fig. 10). These figures show nicely how applying the know-how gained from RAS services alone, without investment in quality seed, already results in a substantial yield increase to a level that is over 50% higher than the statistical average. Unfortunately no data are available concerning the outcome of introducing only improved seed without changing the production practices.

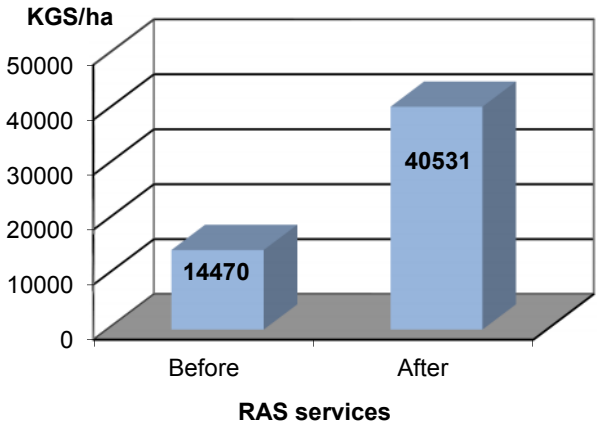
6.3.2 Profits, farmer's attitude to sugar beet and implications for government policy

Profitability

Profits per ha of sugar beet crop with RAS services more than double (fig. 11). Without RAS services the crop is not much more profitable than wheat; at the yield level of RAS clients it is more attractive, though potato and vegetables have still a substantially higher profit potential.

In earlier years the sugar mill paid farmers per ton of sugar beet, while in recent years payment in the form of sugar became common. The interviewed farmers stated that with the latter, profits of farmers are higher. If the government wants to increase sugar beet cultivation, it needs not only to ensure sugar yield-based payment or another fair payment mechanism, but also promote use of advisory services.

Figure 11. Profitability of sugar beet



Utility of sugar beet service

All respondents reported to have used the knowledge gained from the services. 25% of them stopped using the knowledge, respectively stopped growing sugar beet some years after receiving the service. They gave low profitability, high input costs and non-operation of sugar mill as reasons. One stated that sugar beet negatively affects soil fertility. Many respondents complained about the low prices paid by the sugar mills, which reduced the profitability of the crop to an unattractive level. With renewed efforts of the government and the sugar mill to promote sugar beet cultivation, recently the crop became more profitable.

Despite the problems with the revenue from sugar beet, 79% of the respondents assess the sugar beet services as very useful, 21% as somewhat useful, and no respondent rated them as not useful.

83% of the respondents mentioned increased yield and/or revenue as benefit from this RAS service. Other benefits mentioned occasionally were reduced expenditures for labour and less problems with weeds (effects of herbicide use), higher sugar content, enhanced soil fertility and guaranteed sale.

6.4 Tomato

- With RAS services, RAS clients in Chui Oblast increased their tomato yields by 50% from 20 to 30 t/ha and the profits from tomato cultivation by around 30%.
- In Jalalabad a small number of farmers producing tomato in low plastic tunnels increased their profits by 250% from around 127,000 to 434,000 KGS/ha after RAS services.

Vegetables – tomatoes, cucumber, carrot, onion, cabbage, cauliflower and others - are the most profitable cash crops for farmers in almost all areas in the Kyrgyz Republic. Tomato is the most widely grown among these vegetables and is included in this document representative for vegetable cultivation in general.

6.4.1 Yield and profits

Fig. 12 a and b show the tomato yield and profit increases achieved by the interviewed RAS clients in Chui and Jalalabad as a result of RAS services.

The Chui farmers grow tomatoes in the open field, mostly using Integrated Production Management (IPM) practices. They increased their tomato yield on average by 50% from 20 to 30 t/ha and the profits by close to 30% from around 68000 to 88000 KGS per ha.

The Jalalabad data are from a small number of farmers (n=4) growing tomato under low plastic tunnels to get an early harvest at times when prices are high. The yield increase achieved is around 34%, whereas the profit is four times as high as before RAS services. These data document the extraordinary potential of early tomatoes in the lower areas of the Southern regions of the country.

Fig. 12a. Tomato yields before and after RAS services

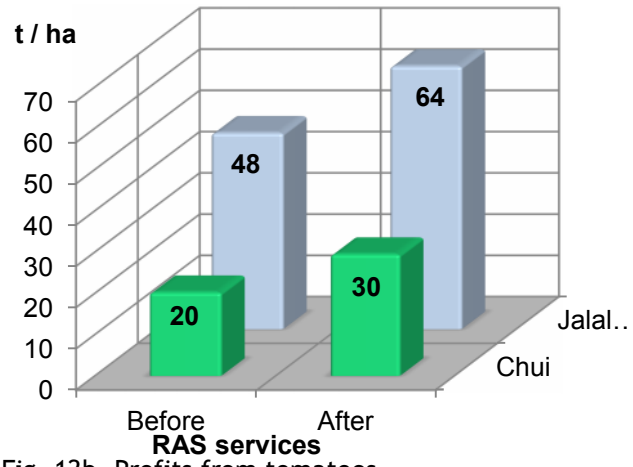
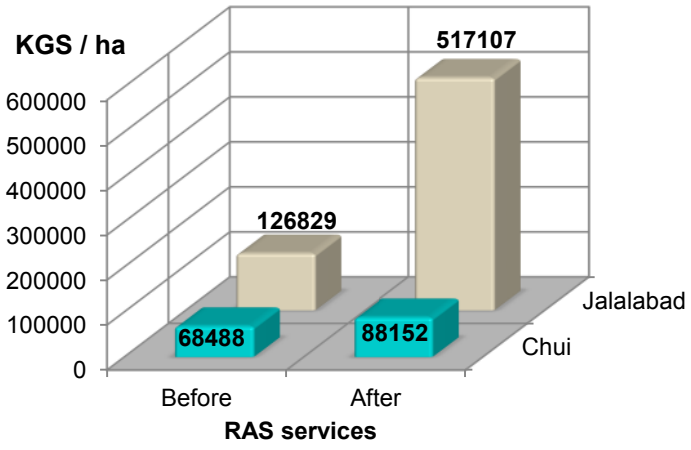


Fig. 12b. Profits from tomatoes



6.4.2 Policy relevance

Vegetable cultivation offers an excellent opportunity for generating more income in rural areas and for improving the nutritional status of people in the mountainous locations.

In Naryn, for example, vegetable growing has been introduced by the RAS to many farmers who were thinking that vegetable cultivation is not possible or sensible in their areas. But still most of the vegetables in the Naryn markets are transported in from lower areas, although farmers report that locally produced vegetables sell easily in their markets. Although vegetable cultivation is labour-intensive, the productivity per invested working hour is higher than for common field crops. Encouraging farmers in increasing local vegetable production in Naryn and other mountainous areas is therefore an avenue for the government to promote economic development in those areas (in addition to promoting the livestock sector).

In Chui and the lower lying areas of the Southern Oblasts, vegetables are for many farmers by far the most important source of income, as they are substantially more profitable than cereal and technical crops. However, the Government encourages farmers to expand the area for cereal crops (and sugar beet in the case of Chui) in order to reduce the quantity of wheat and sugar that need to be imported. Instead of encouraging an expansion of the area under food-security relevant crops at the expense of more profitable vegetables (and some other crops), and so reduce the profitability of farms, the following policy would be more desirable:

1. Encourage farmers to expand and professionalise the cultivation of the most profitable crops. The majority of these are vegetables, some of which have also excellent export potential.
2. Support farmers in increasing their cereal (and sugar beet) yields per area through access to advisory services, in addition to improved seed and inputs.

This is almost certainly economically more viable, as the revenue generated by vegetables will be higher than the cost of importing the remaining shortfalls in cereals and sugar. However, these economics need to be calculated through with actual figures and for different price scenarios of all the concerned products.

There are also some other issues that would need to be addressed in such a policy, in particular how to deal with too high and too low wheat prices.

7 Introduction of crop rotation in Naryn

- Although crop rotation requires collaboration with other farmers and complex changes in farm operations, it has been spreading beyond RAS clients and continued to spread also without RAS supporting its introduction.

On the Soviet time Kolkhozes and Sovkhozes crop rotation was common. After the division of these into individual farms with small land plots, the Kyrgyz farmers were unable to devise practical crop rotation patterns. And still today, in KR only few farmers practice crop rotation. Together with inadequate and unbalanced use of fertiliser, this is noted as the key cause of declining soil fertility in the country.

The RAS assist farmers in re-introducing crop rotation. RAS Naryn developed rotation schemes, which can be used on small land plots and through collaborative arrangements with other farmers. The core of the rotation schemes is the re-introduction of esparsette and other leguminous fodder crops. This increases fodder availability as well as soil fertility.

The re-introduction of crop rotation is among the most important services of RAS Naryn; other regional RAS offer the service too, but not as extensively as in Naryn.

7.1.1 Influence on income

As the introduced crop rotation schemes and the land use before the introduction of crop rotation are very diverse (e.g. move from natural grass to esparsette + barley, from wheat to wheat + esparsette seed and several others), the available data do not allow quantifying average increases in productivity. Instead we'll have a look at the income per ha: the introduction of crop rotation resulted in an average income per ha by almost 90%. The variability is very large – ranging from a farmer with no income increase as he replaced wheat with esparsette the rotation, to increases of around 370% through the introduction of esparsette or wheat into the rotation on previous hay meadows.

7.1.2 Utility of the crop rotation service

The farmers interviewed in detail about crop rotation mentioned the following benefits from the introduction of crop rotation:

Increased yields and/or income – 85 %	Improvement of soil fertility – 44 %
Introduction of esparsette seed production – 15 %	Increase in fodder availability – 11%
Other benefits mentioned by some farmers – sale of produce, increased knowledge	

68% of the farmers who received the crop rotation service, assessed it as one of the most useful RAS services. This is a remarkably high appreciation, considering that the main goal of crop rotation is maintenance or improvement of soil fertility and not increase of profitability. It reflects probably on the one hand that farmers begin to understand the importance of soil management, and on the other hand, that the rotation schemes introduced by the RAS, also quickly result in higher yields and incomes. One farmer in Jumgal observed in 2008 that he only in this drought year understood the true benefits of crop rotation, as he achieved despite the very low water availability a fairly good potato yield, while his fellow villagers all had dismal yields in that year.

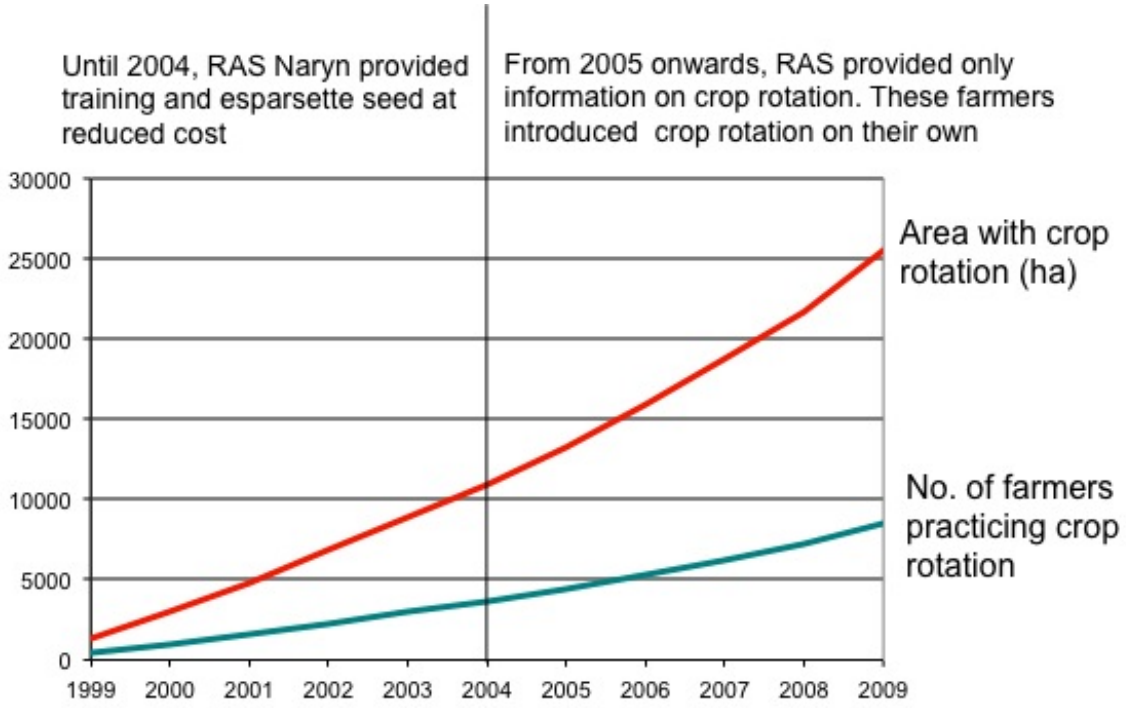
Interestingly, only rather few farmers mentioned increased fodder availability as benefit from crop rotation, although RAS advisers and any specialists, who are aware of the importance of better winter-feeding for livestock productivity, would give more importance to this aspect. This indicates that the

awareness and understanding of Naryn farmers about the potential of better winter-feeding for their livestock operations is still weak.

7.1.3 Spread of crop rotation beyond RAS-trained farmers

Crop rotation is one of the innovations introduced by the RAS, which spread on its own far beyond RAS clients. Until 2004, RAS Naryn provided esparsette seed at 50% of its cost to farmers interested in introducing crop rotation. From 2005 onwards, RAS provided only information to interested farmers. The spread of crop rotation continued, although RAS did not support its introduction anymore intensively.

Figure 13. Spread of crop rotation beyond RAS clients (figures compiled by RAS Naryn)



7.1.4 Policy implications

Decline of soil fertility because farmers do not use appropriate soil management practices, is widely agreed to be one of the crucial problems of agricultural production in the KR. Many specialists are of the view that crop rotation, which was common in the Soviet system, is not possible with the current small farm sizes. The success of the RAS-promoted crop rotation schemes however show that it is possible to adapt crop rotation to the current conditions. In a situation, where synthetic fertilisers become more and more expensive and their proper application unprofitable, the wider dissemination of crop rotation, together with other successful RAS-promoted soil management practices, such as bio-humus (a form of composting), and other organic practices, through government programs, could make a substantial contribution to alleviating the soil fertility problems in the country.

8 Effects of RAS services on livestock productivity

8.1 Meat breed sheep in Naryn

- The RAS service of introducing meat breed sheep into herds increases profits per sheep by more than 50%.
- Because farmers who received this RAS service, increased the number of sheep kept by 60%, the total net value of the sheep herds far more than doubled.

Sheep are traditionally the most important type of livestock for Kyrgyz farmers. However, the prices for wool have not been attractive for many years (there are signs that this may be changing again), and the wool quality produced in KR not in demand for various reasons. With the demand for meat increasing, it became more and more interesting to raise sheep for meat. The RAS service on meat breeds provides access to quality breeding animals from other areas, and advice on improving keeping and care of the animals. It is particularly in demand in Naryn, but also among the fairly common RAS services in other regions.

8.1.1 Productivity and profitability

Access to breeding rams of meat breed sheep (mainly Edelbai, in some cases Gissar) is among the most successful services of RAS Naryn. The introduction of these meat breed sheep into the sheep herds of RAS clients results in an increase of the meat weight per animal of on average 40% (in some cases farmers probably gave live and not meat weight). The increase in profit per head sold is at a similar level. With the shift to meat breeds, the interviewed RAS clients increased the number of animals they keep by 62% from on average 26 to 42 heads (more than twice the statistical average for Naryn Oblast of 18 heads of sheep and goats per farm).

The total net value of the sheep kept (number of heads multiplied by potential profit per head) far more than doubled from 63000 to 158000 KGS. The profits a farmer earns from a sheep herd in a given time period, of course depends on how many animals he/she sells.

Table 1. Effect of introduction of meat breed sheep into herds (n=13)

	Before RAS services	After RAS services	% increase
Meat weight per head in kg (in some cases live animal weight)	30	42	+ 40%
Income per head (KGS)	4269	6071	
Expenditures per head (cost of animal purchase divided over 4 years)	1833	2309	
Profit per head (KGS)	2436	3762	+ 54%
Number of heads kept per farmer	26	42	+ 60%
Total net value of sheep herd (KGS) (based on potential profit per head)	63333	158004	+ 149%

Note: The figures given by the respondents suggest that in some cases they gave the live weight instead of the quantity of meat per sheep. This means that the absolute figures may be somewhere in between. It also means that the figures cannot be related to statistical data, as these only give live weight.

A quarter of the respondents reported having introduced other changes such as correct care, timely vaccination, diversification of feed, and seasonal mating, apart from introducing new breeds.

8.1.2 Benefits and utility of meat breed sheep service

The interviewees mentioned the following benefits of the meat breed sheep service:

Increased production, income and/or animal weight – 84 %	Increase in number of heads – 26 %
Improved quality of animals– 32 %	Other benefits mentioned – early maturity of animals

Two third of the respondents rate this service as very useful, one third as fairly useful and none as not useful. 45 of the 49 respondents (92%), who used the meat breed sheep service, rated it among the most useful RAS services. A number of respondents reported difficulties in coping with the keeping requirements of the new sheep. Nevertheless most of them rated the service as very useful, which indicates that they finally overcame the difficulties.

8.1.3 Policy implications

Recently, prices of meat in the Kyrgyz Republic were rising severely. The government was looking for ways to control the price increase and it was suggested to prohibit exports. On a longer term, however, Kyrgyzstan has the potential to produce sufficient meat for domestic consumption, as well as a surplus for export. These results of the RAS services show that advisory services are a highly effective complementary element to the diverse efforts to improve livestock productivity undertaken by the government and various donor programs, such as the introduction of community pasture management and reforms of the veterinary system with vaccination programs and the encouragement of private veterinarians in villages.

8.2 Poultry in Chui and Naryn

- As result of RAS services egg productivity increased by 27% in Chui and by 39% in Naryn.
- The farmers who received poultry services far more than doubled the number of layers kept, and the profits from poultry nearly tripled in Chui and increased nearly four-fold in Naryn.

On many farms in Chui, Naryn and elsewhere in the KR, women keep some poultry. They provide eggs and occasional meat for the household. With improvement of poultry keeping practices and breeds as promoted by the RAS, poultry can become a home-based business, which contributes substantially to household income, in addition to its value for family nutrition.

8.2.1 Productivity and profitability

Table 2 below shows the improvements that clients achieved after using RAS services on poultry raising in Chui and in Naryn. The figures also indicate that in terms of poultry productivity, RAS clients are already ahead of the average Kyrgyz farmer without RAS services (while for most of the other investigated farm branches, the interviewed farmers were below or just about average before getting RAS services).

Based on the know-how and confidence gained from RAS, the interviewed farmers increased the number of animals kept, as well as egg productivity substantially.

RAS clients keep more heads than the average farms in the respective Oblast. In Chui, they moved from 26 heads (below the average of 35) to 55, and in Naryn from 14 (the average there is 4) to 41, which is 10 times more than the average. RAS clients gained know-how and the confidence to master poultry keeping; this reduces the risks and so they are able to increase the numbers.

As per statistics, the average annual egg yield per layer (2005-2009) was 144 in Chui and 47 in Naryn. After RAS services, the RAS clients achieve a productivity that is 65% above average in Chui and over 300% above average in Naryn.

Profitability per layer increased by 30% in Chui and by 25% in Naryn. Most notable is the change in total profits from eggs with a nearly three-fold in Chui and close to four-fold increase in Naryn. Due to lack of data, the profits from the poultry meat are not taken into account here.

The annual profit from 55 layers, approx. 50000 KGS, which the RAS clients in Chui achieve, is more than the salary of a teacher, and requires only a fraction of the time of a full teaching job. In almost all cases, poultry is a women's business, and it strengthens the women's position in society by enabling them to contribute to the household budget.

Table 2. Changes in poultry production and profitability

	Before RAS services	**After RAS services**	**% increase**
CHUI (n=15)			
Egg production per layer and year	181	238	+ 27 %
Income per layer (KGS)	794	1091	
Expenditures per layer (KGS)	132	176	
Profit per layer (KGS)	**662**	**915**	**+ 38%**
No. of layers kept	26	55	+ 112 %
Total profit in a year (KGS)	**17212**	**50325**	**+ 192 %**
NARYN (n=10)			
Egg production per layer and year	115	159	+ 39 %
Income per layer and year (KGS)	509	708	
Expenditures per layer (KGS)	132	176	
Profit per layer (KGS)	**377**	**532**	**+ 25%**
No. of layers kept	14	41	+ 187 %
Total profit in a year (KGS)	**7927**	**29'910**	**+ 277 %**

Note: The expenditures do not include labour costs. Kyrgyz farmers, in particular women, normally do not account for their labour, as opportunity costs for labour are relatively low.

To achieve these improvements, the respondents introduced the following changes:

Improved feed - 44%	Appropriate care - 44%
Timely vaccination - 29%	Establishment of stall - 24%
New breed - 18%	Use of bio-incubator - 9%
15% of the interviewees used the RAS service to start newly with poultry rearing	

8.2.2 Benefits and utility of the poultry service

74% of interviewed farmers rate the service as very useful, 38% as useful and 1 respondent as not useful. Of the clients who got services on poultry, around 60% rate it as among the most useful RAS services.

The interviewees mentioned the following benefits of the poultry service:

Increased production and/or income – 82 %	Increase in number of heads – 26 %
Improved condition of animals – 25 %	Availability of eggs and meat for family – 15 %
Other benefits mentioned – poultry manure as fertiliser, eggs also in winter	

All but one respondent in Naryn and two in Chui said they are (still) applying the poultry knowledge gained from RAS. One of them gave as reason for not applying the knowledge any more, low profitability (this is the one who rated the service as not useful).

8.2.3 Policy implications of RAS impact in poultry production

Promoting and expanding poultry rearing at family farm level with the help of advisory services may be a measure to increase eggs and poultry meat produced in Kyrgyzstan substantially, and so replacing at least some of the large quantities of imported poultry products. Commercial poultry factories complain that they are outcompeted by imported eggs and chicken. With around 0.75 KGS production cost per egg in Chui and 1.15 KGS in Naryn – not counting the labour, eggs from family farms, conversely, appear competitive, and consumers view these eggs as of better quality and taste than imported ones. RAS clients say they can readily sell the eggs they produce, even in their own villages.

8.3 Milk production in Chui

- As result of RAS services the productivity of dairy cows of RAS clients increased by 28%.
- The annual profits of farms from dairy cows more than doubled.
- 70% of the farms increased the number of cows kept (this figure includes those who started newly with dairy cow keeping after getting RAS services).

In Chui Oblast milk production is an important part of the farm economy. Marketing is relatively easy (though not optimally profitable), as a number of dairy processing plants operate in the Oblast. The interest in improving dairy cow productivity has been increasing over the years, and in particular farmers increasingly understand that it is better to keep a lower number of productive animals, rather than double the number of low productivity ones.

8.3.1 Number of animals kept

The majority of the interviewed RAS client farmers increased the number of animals kept after RAS services, some newly began to keep cows, some kept the same number and some reduced the heads kept.

Increase in no. of animals kept	55%
Started to keep dairy cows	15%
No change in no. of animals	21%
Decrease in no. of animals kept	9%

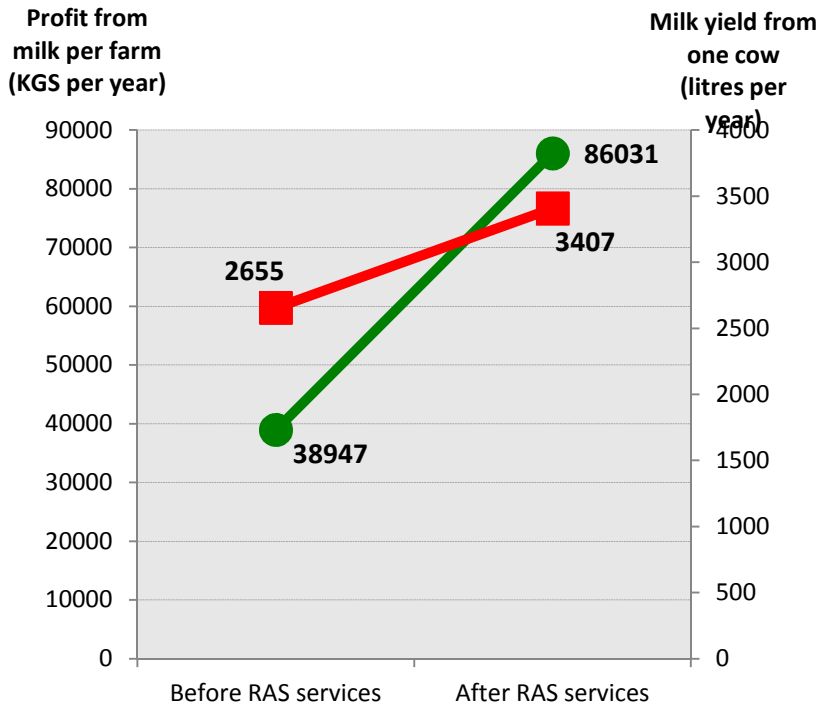
Those farmers, who increased the number of animals, kept on average 1.75 animals before and 4.1 after receiving RAS services (i.e. an increase of 135%). All interviewed farmers together kept on average 2.2 animals before and 3.6 animals after receiving RAS services. As per statistics, the average number of cattle heads per farm in Chui Oblast is 4.8, which means that RAS clients keep less cattle than the average Chui farm. However, the statistical average may be raised by a number of cattle farms with large number of heads, and not reflect the average family farm of the Oblast.

8.3.2 Milk yield and profitability of dairy cows

The interviewed RAS clients could increase the average milk yield per dairy cow by 28%, from below the statistical average in Chui Oblast (2900 litres per year) to well above it.

With the increase in productivity and in number of animals kept, the average profits from dairy cows per farm increased by 120% from close to 40000 to 86000 KGS (fig. 14).

Fig. 14. Annual profit and milk yield from dairy cows (n=44)



This amount of profit after RAS services farmers achieve with 3.6 animals on average, while the profit before came from 2.2 animals. The profit figures include the potential profits from milk used for home consumption, because the survey did not distinguish milk consumed at home and milk sold.

8.3.3 Changes introduced

35% of the interviewees invested in improving their cattle breeds; most of them reported also a change in feeding, keeping and/or health management practices. The remaining 65% of the respondents only improved feeding, keeping and/or health management. The available data do not show any difference in milk yield between those farmers who report breed improvement and those who report only change of management practices.

8.3.4 Benefits and utility of service

88% of the respondents mentioned increased productivity and/or income as benefits of this service. Increase in live weight, availability of milk for home consumption, reduction in expenditures and the resale of animals were further benefits mentioned. 60% of the clients rated the milk service as very useful and 40% as fairly useful. 94% of the respondents use the knowledge gained, while 6% don't use it.

8.3.5 Policy implications

Milk processors in Kyrgyzstan face two key problems: a) getting enough milk in winter, and b) milk quality. Advisory services cannot only assist farmers in increasing dairy cow productivity, but also to increase milk production in winter and in introducing the necessary measures to ensure high milk quality (although this cannot be directly derived from the results of this study). Increasing winter milk quantity needs a substantial change in the cattle keeping and feeding system, which requires investments, which many farmers cannot readily finance. But even where finance can be accessed, farmers will need accompaniment in changing their system – and such support can be ideally provided by advisory services. Improving milk quality needs foremost incentives in the form of a better price for milk which satisfies particular criteria (experience from Siut Bulak dairy factory). If such incentives are there, advisory services can train farmers fairly easily in milk quality measures.

9 Assessment of the utility of RAS services

- The percentage of RAS clients who apply the knowledge gained from advisory services is for the majority of services far above 90%.
- There are only very few clients who rate RAS services as not useful, while over 2/3 of the interviewees consider them very useful.

The interviewed RAS clients were asked the following questions to get an assessment of the their perceptions about the utility of the RAS services:

- Overall application of knowledge gained from RAS services, as well as specifically concerning those services for which they gave detail interviews; here yes or no were the possible answers; in case of no, they were asked in which year they stopped applying the knowledge gained and why.
- Overall utility of the services, as well as specifically of those services for which they gave a detail interview; they could rate the services at three levels – not useful, fairly useful and very useful.

9.1.1 Application of knowledge gained from RAS services

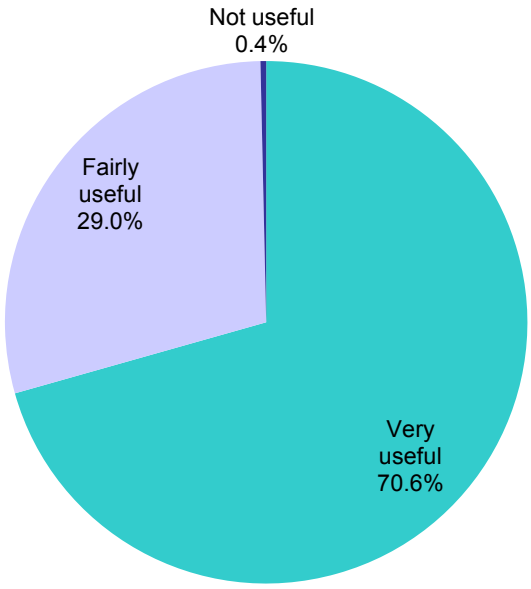
Of 550 interviewees in all surveyed Oblasts who responded regarding the application of knowledge gained from RAS services, only six (1%) said no. For individual services, the percentage of respondents who use the knowledge gained, ranges in the majority of cases between 90 and 100%. Only for sugar beet in Chui Oblast, 25% of the respondents stopped applying the RAS recommendations after some time (see section 6.3 for the reasons).

Utility of RAS services

Almost all the 800 interviewed RAS clients are decidedly satisfied with RAS services and perceive them as very useful or fairly useful. Around 70% of the respondents from all Oblasts rated the services overall as very useful, nearly 30% as fairly useful and very few (less than 1%) find them not useful.

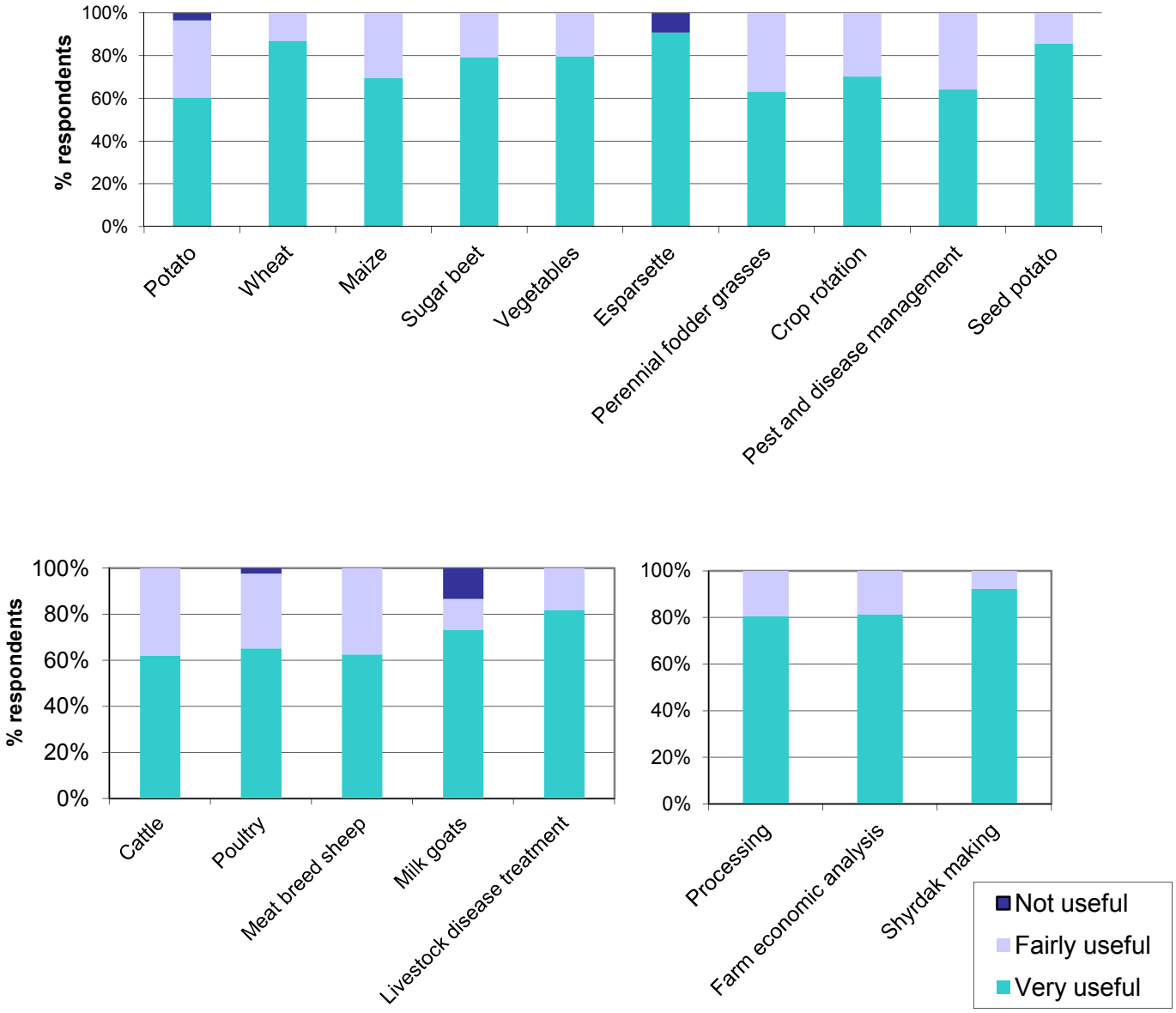
For specific services the ratio of "very useful" varies between 60 and over 90%. Only in a few cases some clients rated a service as "not useful". "Fairly useful" and "very useful" together make for all services at least 87% (see fig. 16).

Fig. 15. Utility of RAS services in the perception of the clients



One of the reasons for the deep appreciation of the RAS services is probably that they provided farmers with know-how and access to required production means in a period where no other organisations – neither public nor private – worked on agricultural development on a broad scale, and up-to-date farming know-how was very difficult to access. The fact that RAS services for nearly all clients have a positive influence on farm profitability is another strong reason for the appreciation of the RAS' services.

Fig. 16. Utility of specific RAS services in the view of the interviewed clients



10 Groups established by RAS

- 84% of the interviewed groups established with RAS support are still working. In areas where RAS stopped working, group sustainability is lower than in villages where RAS still works.
- The most common reason given for discontinuation of groups is discontinuation of RAS advisory work in the area. This indicates that some groups are institutionally not strong enough to stand on their own feet, or they do not have enough common purpose without RAS.

The RAS are supporting rural people in establishing various types of groups. Some of these are informal groups with an immediate short-term purpose, e.g. consultations on a topic of common interest, while others have the explicit goal of longer-term joint activities, e.g. self-help groups and cooperatives. The outcome assessment survey included questions for groups of the latter type with a longer-term purpose. 248 group members of around 150 different groups were interviewed; of them 117 specifically to cover groups, and the remainder within the frame of the normal interviews of individual RAS clients. Here the results of these interviews are presented.

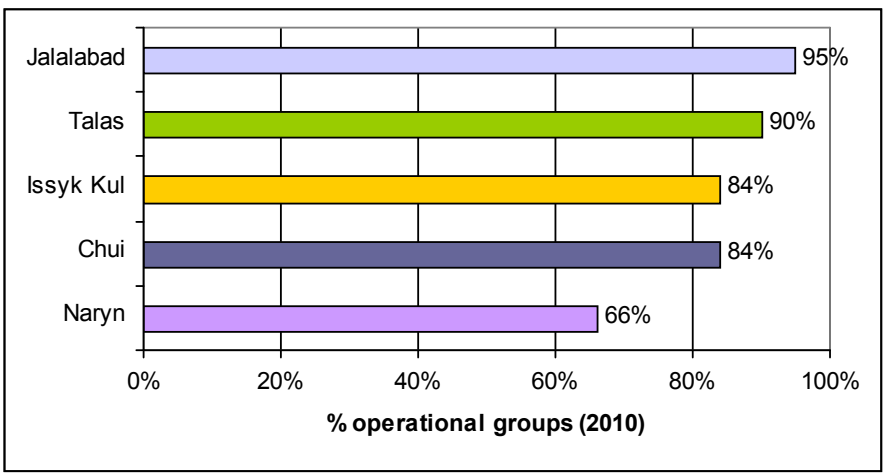
10.1 Characteristics of RAS supported groups

The groups established with RAS support can be roughly divided into two categories – self-help groups focusing on credit and handicraft, and agricultural groups. This division is, however, not sharp. Around half of the groups are registered, mostly at the Aiyl Okrug as community-based organisation, some as cooperatives. The majority of the groups have between 6 and 15 members, with an average of 9.5 when the groups were set up and 7.9 now, i.e. the groups lost 1.5 members over time. This seems a fairly stable membership, although possible member turnover is not taken into consideration. The age distribution of the interviewed groups is as follows: 18% - 8-10 years, 43% - 5-7 years and 31% - 2-4 years.

10.2 Group sustainability

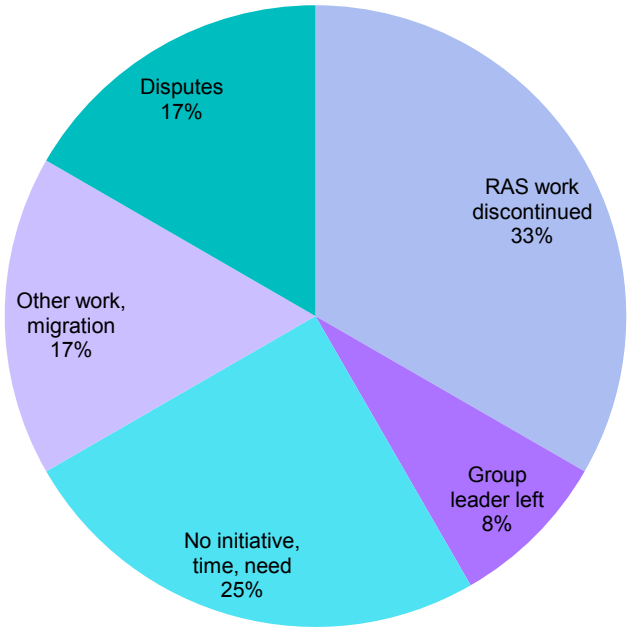
On average 84% of the groups that were interviewed, reported to be still operational, with considerable variation between Oblasts. This rate of groups sustainability is high in comparison to commonly documented sustainability of groups established by development organisations elsewhere.

Fig. 17. % of groups still operational



The figure to the right shows reasons for discontinuation of groups. Discontinuation of RAS work with the groups was the reason given most frequently. Other groups disintegrated due to lack of initiative and time, higher importance given to other activities, no felt need, and due to lack of mutual understanding or disputes.

Fig. 18. Reasons for discontinuation of groups established with RAS support (n=24)



The importance of continuous external stimuli in the form of RAS presence (or other support organisations) for the sustainability of the groups, explains the lower sustainability rate in Naryn. RAS Naryn's annual mandate volume was cut by 55% from 2007 to 2008, and since then some of the survey villages can no longer be served. Note that also in these villages a part of the groups continues to operate without RAS support.

The tendency of a need for continuous RAS presence to keep the groups going, indicates that some groups are institutionally not strong enough or do not have enough common goals to work on their own.

The age of the groups is not linked to their sustainability. The ratio of still operational groups is similar in all age categories.

Note that the study may overestimate the sustainability of the groups established by RAS slightly. Of some of the groups listed by the respective RAS no member could be found during the survey; these groups may or may not be active anymore.

10.3 Purpose and benefits of groups supported by RAS

10.3.1 Purposes of groups

The following purposes of RAS supported groups were frequently mentioned:

▪ Internal savings and credit scheme	▪ Access to improved seed / improvement of crop cultivation (wheat, potato, seed potato, vegetables, fruits, sugar beet)
▪ Access to credit from banks/micro-finance agencies	▪ Improvement of livestock production (general, poultry, AI and vet point establishment)
▪ Wool processing / felt products and other handicrafts	▪ Milk processing /vegetable preservation

In addition, effective pasture management, solving social problems and improving village situation, working together, overcoming poverty, gaining knowledge, increasing profit and living standard, joint marketing, joint purchases of seeds and inputs, joint renting of machinery, and the creation of jobs were mentioned as purpose of the respondents' groups.

10.3.2 Benefits of being a group member

The interviewees mentioned many benefits they obtained through the groups. Below the most frequently mentioned ones are grouped and listed.

Benefit	**Approx. % of respondents (n=248)**
▪ Working together, joint problem solving, friendship, trust, motivation	38 %
▪ Exchange of experiences, mutual learning, gaining knowledge and skills, consultations	28 %
▪ Savings and credit scheme, availability of finance when required, joint solving of financial problems	27 %
▪ Increase of income, development of business	26 %
▪ Increase in production, productivity, quality (crops, livestock, processing, handicrafts) or new business established	22 %
▪ Access to credit from banks/micro-finance agencies	16 %
Other benefits mentioned: Better life, possibility to help others, creation of jobs, ecologically clean and healthy processed products, joint sales, joint purchase of seed, inputs and diesel, joint renting of machinery, products for home consumption, and pasture use rotation scheme	

Most appreciated are the diverse social benefits of working in a group, and the knowledge and skills that become available through the group. Also the savings and credit schemes – or rather the possibility of access to finance in times of need, as many respondents formulated it – are very important benefits. The groups are also considered helpful to increase income, production and productivity. Access to formal credit comes only on the 6th position – it is important, but less than the other main benefits, although nearly 50% of the groups mention credit as one of their main purposes. This proves those voices wrong, who say that RAS groups get together just because of the possibility to get easy access to credit.

11 Return on Investment (ROI)

- The Return on Investment of the main RAS services over the last decade was on average an estimated 24:1, i.e. for every KGS or USD invested in RAS services, farmers get an impressive additional profit of 24 KGS respectively USD.

The previous chapters documented the effectiveness of the RAS services. But what about the costs of achieving these results? Are RAS services not only effective, but also cost-efficient? This section provides an approximated answer in the form of an estimate of the Return on Investment (ROI) for RAS services, i.e. the value generated in farmers' pockets per Som invested in RAS services, in one year, for the most important crops and livestock types of the Kyrgyz Republic.

11.1 Estimated ROI for key RAS services

On average, every Som or USD invested in the main RAS crop and livestock services generates an estimated 24 Som / USD of additional profit for the clients (table 3 below). This is an extraordinary ROI of 2400% (see section 11.3 for explanations on how the ROI was calculated).

Table 3. Estimate of ROI for different RAS services and regions (Som generated per Som invested)

	REGION	**Estimated ROI**
CROPS		
Wheat	Chui	20 : 1
	Jalalabad	33 : 1
Potato	Chui	35 : 1
	Naryn	6 : 1
Tomato	Chui	3 : 1
	Jalalabad	73 : 1
Sugar beet	Chui	29 : 1
LIVESTOCK		
Dairy cows	Chui	14 : 1
Meat sheep	Naryn	28 : 1
Poultry	Chui	20 : 1
	Naryn	10 : 1
ROI over all above services and regions		24 : 1

The ROIs for particular services and areas range from 3:1 to 73:1. The differences in ROI can in some cases be attributed to differences in profitability increase as a result of RAS services, and in some cases to differences in area under the respective crops or in animal numbers per farm.

Even the lowest ROIs provide with 3:1, 6:1 and 10:1 remarkable returns (300 to 1000%). These concern the services on tomatoes in Chui, as well as on potatoes and poultry in Naryn. The reason for the comparatively low ROI is that the clients grow these crops on small plots and keep a rather small

number of animals, and that therefore the service cost per area and per animal are relatively high. This does not mean that these services are less valuable for the clients; on the contrary, these services bring substantial improvement for the clients (as shown in the respective sections). For example the 70% yield and profit increase for potato in Naryn had a substantial effect on family well-being and food security, as becomes evident when talking to RAS clients in Naryn.

11.2 Comparative appraisal of ROI of RAS services

Comparison with ROI in other studies

Authors trying to estimate ROI for agricultural advisory services, and for development interventions in general, state that it is not simple to assess ROIs, and that studies which attempted to do this, use a variety of methods and approaches. Therefore comparisons have to be viewed with some caution. Nevertheless, it is certainly worthwhile to look at the ROI of RAS services in relation to other ROI calculations.

Even the lowest ROI estimate of 300% (3:1) for RAS services is far higher than the average ROI for agricultural advisory services found in a meta-study (80 cases from diverse industrialised and developing countries) of 85% (Alston et al. 2000). Data from an impact assessment of an advisory service program in Uganda result in an estimated ROI between 210% and 590% (calculated based on data from Benin et al. 2011).

An impact study of a range of economic competitiveness initiatives of USAID (including horticulture and dairy sectors) documented a ROI of 19:1 (estimated additional value generated per USD of total program costs). In this study the ROI was calculated for a period of 5 years. Our ROI calculations are limited to one year, although the benefits continue to accrue for the subsequent years.

In comparison with these ROI calculations, it becomes evident that the ROI of RAS services is extraordinary.

Explanatory factors for ROI of RAS services

Why RAS services appear to have had such a high ROI? What is the situation concerning ROI of advisory services now and what can be expected in future? The following factors provide explanations:

- The RAS normally work with groups of clients. This keeps the cost of service provision per farmer low.
- At the time when RAS started to work in 1999, agricultural productivity in the country was still suffering from the shock of the collapse of the Soviet system. The potential for improvement for average farmers was thus very high in the first half of the past decade, and, as the still low average productivity in the country shows, continues to be substantial. In an environment, where access to quality seed and breeds, inputs and credit, and also knowledge and information of any kind, is difficult for individual farmers, this potential for improvement could be unlocked with relatively simple and inexpensive services.
- It can be expected that the ROI for the services included in the current analysis, which directly result in monetary benefits, was higher than for some other RAS services, such as home-scale processing, soil management or building up micro-enterprises. But even in case the actual average ROI over all RAS services was only half of the one estimated here, the resulting 12:1 (or 1200%) return is very high.
- The ROI of RAS services depends on the one hand on the costs of the RAS services and on the other hand on the production costs, and revenue earned with farm products. The costs of RAS services have increased since 2009 (due to inflation and a change from payment for number of activities conducted to number of working days required for an activity). Production costs also increased due

to inflation of input prices. Revenue from agricultural production fluctuates between years, and overall is decreasing for some branches and increasing in others. The current ROI of RAS services may therefore be somewhat below the level found in the outcome assessment. The future ROI of RAS services depends therefore strongly on the ability of the RAS to advise farmers on how to adapt their production mix in a way that optimises revenue and minimises risks.

11.3 Calculation of the ROI

There are various options for ROI calculations. Dictated by the availability of data, the following way was chosen. The ROI was calculated as follows:

Crops:	ROI = ((“income increase per ha” x “area per farmer after services”) – “cost of service per farmer”) / “cost of service per farmer”
Livestock:	ROI = ((“income increase per head” x “no. of heads before services per farmer”) + (“income per head” x “no. of additional heads after services”) – “cost of service per farmer”) / "cost of service per farmer"

(1) As approximation for the cost of services per farmer, the average of prices of the respective services in 2007 and 2009 and an estimate of the combination of services required for these results were used.

(2) The service costs are taken from the service price list for the mandate of KSAP/AISP and paid to the RAS.

(3) For livestock, the combination of services required for achieving the results includes complex livestock management training and the provision of access to improved breeds.

(4) For crops, the combination of services includes a complex demonstration with field days, technical training and the provision of access to improved seeds.

(5) The service costs include all cost incurred by the RAS for providing the package of services (remuneration of field adviser, transport cost, training and demonstration materials, a share of office operation costs, a share of management and administrative staff).

(6) For calculating the overall ROI, the added value per farmer over all services, as well as the service costs per farmer to achieve the added value over all services were summed up.

(7) For the ROI in case only 75% of the clients achieve the average results, the added value over all services was multiplied by 0.75 and the service costs over all services multiplied with 1.5.

(8) Note that the ROI calculations include all costs of service provision, but not the costs of technical assistance projects, which supported the establishment and capacity building of the RAS system over the years of their existence.

12 RAS newspaper

- The newspaper Beles of RAS Jalalabad is widely purchased and read by its clients.
- The readers practically apply the information provided in the newspaper and derive tangible benefits from this.

All RAS are issuing their own newspaper. Earlier they were all published monthly. Now, due to funding constraints, the frequency of the newspapers varies between monthly and quarterly. Representative for all RAS newspaper, questions about the RAS Jalalabad newspaper "Beles", which is published monthly in approx. 2500 copies, were included in the survey.

12.1 Use and benefits of Beles

Of 61 RAS clients who were interviewed about the newspaper 90% know it. The majority of them also purchases it: 67% purchase it regularly, 25% 1-2 a year (of 12 issues) and the remaining 4% less than that.

Nearly 90% of the respondents, who know and read the Beles, said that they utilise the information from the newspaper. While one may think, that it is easy for farmers to say this, the very concrete and precise answers of many farmers when asked what information they use, indicates that they really practically apply information gained through Beles.

Examples of information from Beles practically applied by clients	
▪ Right quantity and timing of irrigation of tomatoes	▪ Growing seedlings in plastic bags
▪ Correct planting of potatoes	▪ Cultivation of vegetables in plastic tunnels
▪ Application of indigenous and conventional livestock treatment methods	▪ More careful livestock keeping
▪ Preparation of organic fertiliser	▪ Address of farmer who raises a particular sheep breed
▪ New recipes for processing / conservation	▪ Pest and disease control methods (indigenous and chemical)
▪ Description of varieties	▪ Fruit nursery techniques

The respondents also gave examples of benefits, which they gained from the application of know-how provided through Beles:

Examples of benefits from application of Beles information	
▪ Yield increase	▪ Increase in income / profits
▪ Better quality of produce, less pest and disease damage	▪ Knowledge and skills
▪ Better types of processed products	▪ Less expenditures
▪ Livestock recovered from illnesses	▪ Conservation of fruits and vegetables for winter
▪ Improvement of lambing	▪ Introduction of new varieties

12.2 Conclusions concerning RAS newspapers

The regular newspapers for the RAS are an instrument to disseminate information, and also to show presence in their region. The above results document that the newspapers provide an effective service to the readers.

However, as the RAS have no longer any core funding, it becomes more and more difficult to finance regular publication of these newspapers, although they are sold at a price and not distributed for free. The possible sales price (3-10 KGS per copy) does not cover the production costs. The RAS are trying to include a budget post for publication of results and insights into all donor projects in which they are involved. However, not all donors agree to this. Given the utility of the RAS newspapers, it would be highly advisable for donors providing mandates to RAS to allow a contribution to articles in RAS newspapers in their mandates.