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Agricultural Vocational Educational Project

Competence Profiles

Working groups of №2 (Karakol), №19 (Altyмыш), №81 (Bokombaev) and №82 (Ananevo) vocational schools

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ABBREVIATIONS:

AVEP	– AGRICULTURAL VOCATIONAL EDUCATIONAL PROJECT
ACM	– AGRICULTURAL MACHINERY
LSPM	– LABOUR AND SOCIAL PROTECTION MINISTRY
VS	– VOCATIONAL SCHOOLS

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1. Introduction

1.1. Prerequisites of creating AVEP

The changes occurred in Kyrgyzstan in last 15 years have touched also agricultural education sphere and it was a reason of making changing in this sphere.

The system of former education in Soviet time had the following structure:

Higher educational institutions	Special secondary schools	Vocational technical schools
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The given system prepared specialists in any certain area of an agriculture that was suitable for the requirements of that time.

With the development of farming in the republic there came a necessity for a new profession and it is - a *FARMER PROFESSION*.

Since January 2001 Helvetas- Kyrgyzstan started the realization of an experimental phase of an Agricultural Vocational Education Project on professional training of farmers and women farmers in two Lyceums (№ 15 and № 50) in Naryn oblast. In 2003 the Project covered other five vocational schools (№26 Chaek, №40 Ak-Talaa, №30 Dobolu (filial of Dostuk VS), №32 Atbashy, №86 Kulanak) had been included to the realization of the project experimental phase.

In 2004 with the support of the GTZ, Project expanded its activities to Batken oblast and started to collaborate with №8 vocational school which is situated in Kyzylkiya.

Starting from 2006 on the basis of the experiences gained in Naryn and Batken oblasts the Project expanded its activities in agricultural vocational schools in Yssykkol and Chui oblasts to develop the sustainable vocational education system and to keep the innovations in high level. So four vocational schools: №2 Karakol, №19 Kemin (filial of Altyмыш VS), №81 Bokombaev, №82 Ananevo vocational schools were selected according to the competition and started its activities as an experiment.

1.2. Idea of competence profile

The first step in the implementation of the new „farmer-entrepreneur“ profession by the Project was to define competence profiles. . As far the „farmer-entrepreneur“ profession is a many-sided profession, competence profile was worked out to define related skills and knowledges.

Objective of the Competence Profile. Farmer profession includes a lot of skills and special knowledge. Using this information we can create vocational educational system, working out a curriculum and at last teaching materials or to have a direction for the education.

In the process of defining the competence profile we had to define those fields of knowledge and skills that will be necessary for the farmers in eastern Chui and Yssykkol regions.

1.3. Mechanism of defining the competence profile

Competence profile was worked out by working groups of vocational schools №2, №19, №81, №82 and AVEP team, after having had Participatory Rural Appraisal researches on farms in eastern Chui and Yssykkol regions¹.

2. Farms in Chui and Issikkol regions

2.1. History

Traditionally, the Kyrgyz were a horse- and sheep breeding people. Cattle were less important because they are less mobile and less able to get at forage grasses under deep snow. By the 19th century, permanent dwellings became the norm at herders' winter camps and simple stock shelters were constructed. The irrigated cropland area was expanded.

Agriculture under Soviet planning became more diverse and more intensive. The collectivisation of agriculture started already in the 1920s. State and collective farms cultivated between 2'300 and 3000 ha of arable with specialised workforce. The Ministry of Agriculture centrally planned and controlled production issuing instructions to the state and collective farms. Crops and livestock enterprises were not integrated with each other. As a result, workers were exposed to a very narrow view of farming systems and not experienced to produce a living from the land by the efforts of their own hand. Agriculture was fully mechanised. Machinery was kept in machinery pools which also served as repair and maintenance workshops.

After collapse of Soviet Union the land reform began and almost all former sovkhoses and kolkhozes were dissolved and their arable land and livestock have been distributed among the inhabitants. A family received in average between 2 and 4ha of land, a few sheep and 1 or 2 cows. That's way the present day agriculture in most parts of the country is characterised by smallholder structures.

The former employed of the kolkhozes and sovkhoses, being educated as specialists (teacher, tractor-driver, hydro-specialists, etc.), became farmers without any understanding of the broader context of farm management. Most farmers lack machinery and have to rent it. Manual and horse labour partially replaced the former fully mechanised way of production. Quality seed, fertilizer, and agrochemicals are hardly used.

Agriculture became the dominant sector of the Kyrgyz economy. In 2004, agriculture accounted for 36 % of GDP and 53% of employment (WB, 2004).

2.2. Natural conditions

The natural and climatic conditions in Issikkol and Chui regions are very hard. Kemin, Tong, Aksuu and Issikkol rayons' (regions where №2, 19, 81 and 82 vocational schools are situated) climate is continental and characterised with its middle-long and cold winter. Annual rain is between 200-500 mm. The soil is grey, brown and black earth. Vegetation period is 200-240 days, soil with the content humus between 0.71-2.14%. The land is mountainous at 1100 – 1800 m at sea level and characterised with its dryness in winter period.

2.3. Farms in eastern Chui and Issikkol regions

Farms in Kemin, Tong, Aksuu and Issikkol regions are rather different, but we can point out general peculiarities of farms in these rayons:

- Development of fields according to tradition and climate conditions (poultry, sheep, goat, horses, yak, camel, etc.);
- Orientation for production which require less expense;
- Effort on increasing income and decreasing costs;
- Producing products for own use only;

¹ Barbara Willen, "Participatory Rural Appraisal" in Eastern Chui and Issikkol oblasts, 2006-ж

- Weakly developed infrastructure;
- Lack of irrigation water for arable lands;

2.4. Organization of the farm

One or sometimes several families (relatives) run a farm. At the same time there is a division of work that every member of the family has its destined activities. That means there is a work division according to the gender: women are mostly busy with housekeeping, producing handicrafts, milking cows, product processing, poultry husbandry while men are working with animal husbandry, field husbandry, fodder production and machinery service. But for vegetable and fruit production both gender are involved. Farmers and members of the family do all the work on a farm and in special cases e.g. harvest or house construction they hire workers. More information about work division is described in table Basic kinds of work during the year are given in the table 1.

Table 1: Description of seasonal farming activities this table is empty in the English version

Activities \ Monthes		1	2	3	4	5	6	7	8	9	10	11	12
Agronomy	Repairing machine		■	■									
	Cleaning stony field									■	■	■	
	Ploughing			■	■	■	■					■	
	Harrowing					■				■	■		
	Making channels					■	■	■	■				
	Seeding, planting			■	■	■		■					
	Using manure		■	■	■	■	■	■					
	Irrigation			■							■	■	
	Gardening											■	■
	Cultivation \ weeding				■						■		
	Using fertilizer			■			■			■			
	Using pesticide			■						■			
	Using herbicide								■	■			
	Weeding				■						■		
	Harvesting					■						■	■
	Harvesting of cereals						■	■	■				
	Harvestig of sugar beat									■	■		
	Potato harvesting									■	■		
	Seed cleaning \ sorting											■	■
	Cutting grass						■	■	■	■	■		
	Cutting tree branches		■	■	■	■							
	Treating apples			■									
Harvesting fruits									■	■	■		
Harvesting vegetables								■	■	■	■		
Livestock	Veterinary service			■	■	■	■	■	■	■	■		
	Shearing			■	■	■	■	■	■	■	■		
	Being to jailoo			■	■	■	■	■	■	■	■		
	Milking (milk, kymyz)		■	■	■	■	■	■	■	■	■		
	Fatting livestock	■	■	■	■	■	■	■	■	■	■	■	■
	Winter foddering	■	■	■	■	■	■	■	■	■	■	■	■
	Insemination					■	■	■	■	■	■		
	Giving birth					■	■	■	■	■	■		
	Looking after the animal	■	■	■	■	■	■	■	■	■	■	■	■

Household, Processing	Household	[Redacted]											
	Making bread	[Redacted]											
	Making jam												
	Salad making												
	Milk processing												
	Wood collecting												
	Patchwork												
	Making Toshok(Patchwork for sitting)												
	Making felt												
	Selling												

Information from the survey is given in the table (15 families or 75 people in 3 generation involved in the survey).

2.5. Main resources of the farm

Main resources of a farm are land, infrastructure, and presence of livestock.

The infrastructure of medium farm usually consists of a house where farmer family live, stable, storage room sometimes in the underground, bath, sometimes a garage. Some of the farm buildings date from the Soviet time as the stables or storage buildings but they are located further away. But at the farm most stables are self-constructed for example by a wall in the back and a manger in the front covered by a roof or without it. At other farms the cows, calves or horse/s are tethered somewhere in the yard and an old small metal container serve as manger. The hay sometimes covered by a roof but mainly the hay is stored unprotected from the weather. In the yard included is a garden where farmers plant vegetables or fruit trees. If the farmer owns machines they stay in the yard without be covered.

The difference to Chui oblast is that livestock is more important than crops cultivation. Therefore in Issyk-Kul oblast there is enough pasture available. In the region of Bakonbaeva one farmer keeps his animals in stable (from Soviet time) during summer which is further from village. Other farmers have spring stables (before going to jailoo) which were built during the Soviet time but they own only some part of the building. In Issyk-Kul oblast is more the case that the farmers have a house in the village but their big stables(from Soviet time) are outside of the villages.

Table 2: Main resources of farms in eastern Chui oblast, 2005 (information of 15 farms)

Resources	Average	Range	Number of owners
Arable and irrigated land	7-8 ha	2-22 ha	13
Rented arable and irrigated land	8-9 ha	2-17 ha	3
Pasture land	50 ha	-	1
Sheep	13 heads	6-20 heads	7
Goats	7 heads	-	1
Cows	1-2 heads	1-3 heads	12
Horses	2 heads	1-4 heads	7
Poultry	25 heads	10-70 heads	13
Ducks	5-6 heads	5-6 heads	2
Turkeys	4 heads	-	1
Donkey	1 heads	1 heads	2

Table 3: Main resources of farms in Issyk-Kul oblast, 2005 (information of 17 farms, for livestock only 16 farmers)

Resources	Average	Range	Number of owners
Arable and irrigated land	5 ha	1.5-15 ha	17
Rented arable and irrigated land	9.4 ha	1-35 ha	5
Pasture land	40.6 ha	0.5-130 ha	6
Sheep	29 heads	5-100 heads	13
Goats	3 heads	2-8 heads	2
Cows	4-5 heads	1-12 heads	16
Horses	3 heads	1-7 heads	12
Poultry	22 heads	6-100 heads	13
Ducks	6-7heads	3-10 heads	2
Turkeys	5-6 heads	2-10 heads	5
Donkey	1-2 heads	1-2 heads	2
Pigs	10 heads	-	1 (Russian farmer)

2.6. Product and Market

If we will make an analyze, we will come to the following result: the medium farm in average produces 30 – 44 different products (food, row products for processing). Among these 12 –19 products are sold or exchanged with barter.

Table 4: Main products of farmers for market sale and home consumption, eastern Chui oblast, 2005 (information of 15 farms)

Importance of market sale	Rank	Produced by gender M-male F-female B-both	Number of farms which mentioned product
Wheat	41	M	7
Milk	38	F	7
Sugar beet /Sugar	36	B	6
Potato	26	B	5
Maize	24	M/B	7
Meat	24	M	2
Hay	18	M	3
Sunflower oil	8	B	2
Flour	7	M	1
Onions	7	B	1
Tomato	7	B/F	2
Vegetables	6	B	1
Apples	6	B	2
Carrots	5	B	1
Barley	5	M	2
Safflower (oil plant)	5	B	1
Vegetable seedlings	5	B	1
Wool	3	M	1
Eggs	3	F	1
Garlic	2	B	1

Importance of home consumption	Rank	Produced by gender M-male F-female B-both	Number of farms which mentioned product
Meat	101	M/B	9
Flour	87	M	8
Eggs	51	F	6
Potato	51	B	6
Milk	43	F	5
Jam	36	F	5
Vegetables	35	B	4
Preserved salads	30	F	5
Hay	24	M	3
Barley	22	M	3
Sugar	20	B	2
Onions	17	B	3
Sunflower oil	16	B	2
Wool	13	M	3
Tomato	13	B/F	2

Cucumber	13	B/F	2
Pepper	13	B/F	2
Ayran (Yoghurt)	11	F	2
Apples	9	B	2
Maize	9	B	1
Garlic	9	B	2
Skin	7	F	1
Kaimak (Cream)	7	F	1
Blackberry	7	B/F	1
Cabbage	6	B	1
Raspberry	6	B/F	1
Nuts	5	B	1
Sary mai (Butter)	4	F	1
Compote	1	F	1

Table 5: main products of farmers for market sale and home consumption in Issik-Kul oblast, 2005 (information of 17 farmers)

Importance of market sale	Rank	Produced by gender M-male F-female B-both	Number of farms which mentioned product
Potato	168	B	14
Meat	124	M	10
Apples	108	B	10
Wool	97	M	9
Wheat	76	M	7
Livestock	64	M	5
Milk	52	F	5
Blackberries	50	B	5
Apricots	42	B	4
Pears	31	B	3
Garlic	30	B	3
Hay	25	M	3
Raspberries	24	B	2
Eggs	24	F	2
Kaimak (Cream)	24	F	2
Curd cheese	24	F	2
Cucumbers	15	B	2
Carrots	13	B	1
Seeds of carrots	12	B	1
Apple seedlings	11	B	1
Horse shoes	10	M	1
Cherries	9	B	2
Rape	6	B	1
Tomato	5	B	1
Small strawberries	4	B	2
Barley	3	M	3
Strawberries	2	B	1
Pumpkins	1	B	1

Importance of home consumption	Rank	Produced by gender	Number of
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(Ranking)		M-male F-female B-both	farms which men- tioned product
Meat	205	M	11
Flour	200	M	10
Milk	193	F	10
Kaimak (Cream)	150	F	9
Potato	149	B	8
Ayran (Yogurt)	107	F	6
Carrots	103	B	7
Preserved salads	96	B	8
Jam	92	F	7
Eggs	88	F	6
Sari mai (Butter)	82	F	5
Apples	81	B	5
Garlic	77	B	6
Süsmö	64	F	5
Cabbage	63	F	5
Hay	60	M	4
Curd cheese	59	F	4
Pears	55	F	1
Cucumbers	52	B	4
Barley	47	M	3
Onions	41	B	3
Blackberries	40	B	3
Apricots	37	B	3
Milk products	35	F	2
Kurut (dried yoghurt)	35	F	2
Tomato	30	F	3
Strawberries	23	B	2
Vegetables	18	B	3
Bozo	17	F	1
Wool	15	M	2
Dried fruits	14	F	7
Grapes	13	B	1
Chaff	12	M	1
Toshok (Patchwork)	12	F	1
Felt (Kyizyz)	11	F	1
Small strawberries	11	B	1
Raspberries	10	B	1
Cow kumuz	10	F	1
Pumpkin	8	F	1
Red beat	7	F	1
Beans	6	B	1
Peas	5	F	1
Radish	2	F	1

2.7. Main problems

(Suggestions of farmers evaluated by searches)

Farmers have a lot of problems and these problems were analysed and divided into the following groups:

Table 6: Main problems of farmers in eastern Chui oblast, 2005 (information of 15 farmers)

Most important problems	Reasons K= lack of knowledge R= lack of resources	Explanations	Rank	No of mention
Lack of machines	R	Village has not enough machines → Delayed grass cutting or crop harvest /Machines service from Naryn oblast/ /Hand harvest for maize and sunflower	165	11
Old machines	K	Difficult to find spare parts/expensive spare parts/No mechanic skills		
Expensive fuel	R	During field work fuel price is increasing	134	10
Irrigation	K+R	Lack of water/Water costs are expensive 500 coms per ha/Old, not cleaned, destroyed or no water channels/flooded fields/No irrigated field → no vegetables cultivation possible/water shortage not organized	90	7
Fertilizer	R+K	Not available in village/expensive/No or weak knowledge in applying it	85	9
Lack of knowledge	K	No or weak knowledge in agriculture/ After working in kolkhoz not enough farming knowledge/Not enough knowledge in processing → milk, vegetables or handicrafts	68	8
Marketing	K	Lack of knowledge for selling products/Difficulties to sell products/Market information is not available	56	4
Credit	R+K	High percentage/difficult to fill the requirements/demanded documents are expensive/ afraid to take credit because other people could not pay it back		
Clean drinking water	R	Affected village are Nischni Noruz, Progress, Boroldoi → different parts in Eastern Chui Oblast/ World Bank has a “water cleaning” project	52	4
Quality seed	K+R	Not available/expensive/no skills to identify quality seed/	51	4
Unemployment	R+K	Only hired work in village	31	4
Electricity	R+K	If people are not paying → electricity cuts/	28	3
Building material	R	Not available/expensive	24	2
Low product prices	K+R	Strong fluctuations of prices/selling for covering costs → no benefice/No support from government	21	2
Herbicide	R+K	Not available in village/ expensive	21	2
Natural damages	K?	Flooded field	20	2
No processing workshops in village		No processing workshops (vegetable) in village /sewing workshop is available but no educated people	20	4
Road in bad conditions	R		17	2
Breeding	K+R	No suitable breed for “racehorses”/ Breeding farm in Kant only selling bulls instead of cows	11	2
No milk separator	R		10	1
Seedling pro-	R +K	Difficult to find polyethylene cover for seedling production and it		

duction		is expensive/ Problems with seed germination		
Stealing		Animals/Reasons for not keep more animals/Crops are stolen on the field	9	1
Not enough fodder	R+K	Not enough land/land used for crops/weak knowledge about winter foddering	8	1
Lack of teacher	R	Not enough teacher in primary school in the village/ Not qualified teacher/ low salary for teachers	7	1

Table 7: Main problems of farmers in Issyk-Kul oblast, 2005 (information of 17 farmers)

Most important problems	Reasons K= lack of knowledge R= lack of resources	Explanations	Rank	No of mention
Lack of machines	R	Village has not enough machines/machine service from other Oblasts/Delayed grass cutting or crop harvest/ Expensive services due to the expensive fuel/ Difficult to find spare parts and they are expensive	139	15
Expensive fuel	R	Makes the machine service more expensive	106	12
Marketing	K	No market information / exposed to price fluctuation/ Low market prices and high prod. costs → selling for covering costs → no benefice /Difficulties to sell products → no buyer for prod./Agricultural products from China/No governmental support	97	12
Irrigation	K+R	Lack of water/water availability by cycle “one after the other” → water is then available when it is not necessary/ deterioration of channels/ flooded field/	70	8
Fertilizer	R+K	Not available in village/Expensive/not enough knowledge for application	57	7
Pesticide	R+K	Not available in village/Expensive/not enough knowledge for application/ Difficulties to recognize apple illnesses and their treatment	45	6
Clean drinking water	R	Concerned villages are Tara-Cyy/Barskoon/Irdik/Koochu/Temir → South and East Part of Issik-Kul	42	5
Lack of agricultural knowledge	K	After working in Kolkhozes not enough farming knowledge for example in livestock, skin and milk processing, pest and illnesses → Colorado beetle and apple schorf	31	7
Quality seed	R+K	Not available/expensive/no skills to identify quality seed/Problems with weeds because not proper seed/ No qualitative vegetable seed	29	3
Herbicide	R+K	Not available in village/Expensive/not enough knowledge for application	28	4
Lack of veterinary knowledge	K	Not able to recognize animal illnesses or to treat them/Not enough knowledge after RAS training	25	4
Credit	K+R	High percentage/difficult to fill the requirements/demanded documents are expensive	22	3
Conditions of roads	R	Road to the field/ Road to the market in Karakol	22	4
No pharmacy	R		15	1
Not enough fodder	R+K	Not enough land/land used for crop/weak knowledge about winter feeding	14	2
Finance	R	Not enough finance for farm development/Not enough profit with farming	13	2
Breeding	R+K	Difficult to find good male animal/No artificial insemination available	12	3
Unemployment	R+K	No working opportunities in village	12	2
Phone	R	Connection problems	9	2
Building material	R	Not available/expensive	8	1
Storage	K	Rats are eating crops in the storage	7	1
Coal	R	Expensive for heating	7	1
Primary education	R	Lack of teacher in village/ Expensive school books	5	2
Wolf	K	Sheep losses	5	1
Salt for animals	K	Far place for buying salt for animals → Farmers from Bakonbaeva have	5	1

2.8. Main potentials

(Suggestions of farmers evaluated by searches)

- Farmers are striving for inclosing new methods, innovations and ways of running the agriculture/farm. (Using new sorts, agritechnical ways, selection)
- Trying to develop mostly profitable fields
- Willing to produce prepared production and its development, deep product processing
- Multiple-discipline many-profiled farm
- Using gained education and knowledge in soviet time and striving for further education

3. «Farmer – Entrepreneur» profession

Skills and knowledges which are described in the competence profile should be taught during the course. On the basis of these skills and knowledges curricula i.e. lesson topics and learning objectives are defined. For each subject skills and knowledges divided into three groups. Skills and knowledges which are under the three stars means „student should obligatory know“, two stars „student should know“ and one star means „would be good to know“.

3.1. Skills in management and infrastructure

3.1.1. Basic understandings

Farmer-entrepreneur profession is based on basis knowledge of many sciences that concerns and relevant to agriculture.

Basics of Economics.

(* * *)

- *Basic understanding of mechanisms of market economy and economical relations (macroeconomics and micro economics);*
- *Human and economics, role and place of human in economics, farmer's role;*
- *Recourses of economics;*
Planning, prognostication and analyze of the economical activity of the farm. Organization of business activity. Conduct and farming in market conditions. Making a farm production plan. Business accounting. Working out a business plan. Crediting system. Making a long term plan of the farm. Calculation and analyse for income. To hold an advertising activities. To sell a product. To be able to set a price for the product, calculation of income and outcome, planning, making a contract.
- *Regional and branch economics;*

(* *)

- *Production branches*
- *How to produce an economical product;*
 - *Human resources, quality, quantity, productivity, approaches;*
 - *Entrepreneurship;*

(*)

- *What is a price and its appearance;*
- *Functions and types of price;*
- *Demand and supply;*
- *Adaptation of market and equal price;*

Accountancy

(* * *)

- *What is accountancy and its idea;*
- *Simple form of farm accountancy;*
- *Accountancy balance, actives and passives;*
- *Documents which are used for accountancy;*
- *To make a calculation;*
- *To realize an accountancy in the computer*

(* *)

- *Income calculation;*
- *Cost calculation;*
- *Calculation of cost price for product;*
- *Gross margin calculation;*
- *To hold an inventarisation;*
- *Cash flow;*

(*)

- *Profit calculation;*
- *Rentablity*
- *Taxes;*

Basics of Law

(* * *)

- *Law and legal basis*
(law on private property, land and land code, tax and tax code, labour code and social welfare laws, contracts, charters, basic understandings an professional unions and associations);
- *Registration of the farm, registration of the property, land, preparation of documents for mortgage and getting credit, farmers have to know for what things he has to pay taxes or taxation basis, writing necessary agreement sheets.*

Basics of ecology

(* * *)

Using natural sources of energy (sun energy, energy of water), using harmless ways of agro techniques (organic fertilizers, crop rotation, and perennial crops). Special attention for using pastures.

- *Basic concepts of ecology:*
ecosystem, circuit of feed, biosystem balance, Human's influence for changing of ecology (anthropogenic factor). Agro systems are the variety of ecosystem. Support the ecosystems. Ecological situation in Issykkol and Chui Oblast. Ecology of soil, chemical content of soil, methods of enriching and concentrating the soil. Forest and wild animal protection;
- *Using natural recourses:*
Using natural sources of energy (sun energy, energy of water), using harmless ways of agro techniques (organic fertilizers, crop rotation, and perennial crops). Special attention for using pastures

Other relevant sciences

(*)

- *Biology, zoology, botany:*
Biology and botany of animals, basic biochemical processes: photosynthesis, division of a cell, cells, organic structure of forages, fodder and food: carbohydrates, fibres, nutrients, fats, degrees of assimilation;
- *Physics:*
Processes of the nature, property of materials, transformation of energy etc.
- *Chemistry:*
chemical processes in the nature, structure and content of soil, compound, basis of organic and inorganic chemistry;
- *Main understandings in psychology and pedagogics.*

3.1.2. Farm management

(* * *)

- *Basic understandings and functions of management and activity;*
- *Daily conducting the farm (decision of the current questions);*
- *Drawing up plans of development for near future and perspectives;*
- *Making preliminarily plans and development stages of the farm;*
- *Strategic and operative management;*
- *Analysis of an economic efficiency, search for partners and markets of selling the production;*
- *Searching for markets and partners;*
- *To define the farm efficiency;*
- *To make a business-plan;*
- *Daily accountings, organization of own cash-book;*
- *Writing agreements and contracts;*

(* *)

- *Investments and its sources and importance;*

- *Analyse other farmers' activities and make a competitiveness;*
- *To make a relation with other people and organisations;*

(*)

- *Financial management;*
- *Efficiency of using machines;*
- *Attraction of seasonal workers;*

Computer accountancy

(*)

- *Main operations of computer;*
- *Managing of main programs:*
 - ✓ Microsoft Word
 - ✓ Microsoft Excel
 - ✓ Microsoft Power Point
- *I-C accountancy*
 - ✓ To make a calculation
 - ✓ To make inventarisation
 - ✓ To make a budget
 - ✓ Calculation of a balance
 - ✓ Reporting

Tourism

(*)

- *Mechanisms of tourism organisation:*
Planning, routine making, to know local geographical condition, to settle and design a yurt, organization of food. Cultural service. To make an agreement or contract. First medical aid.

3.1.3. Infrastructure

(* *)

- *Definition of qualitative condition of the infrastructure;*
- *criteria for evaluating and estimation of quality of the infrastructure:*
buildings, machinery (types, condition), roads (earth, asphalt covering), system of electro supply (line of electro transfers, power, condition), irrigational canals, (length, condition, throughput), drinking water (quality of water, wells, condition of pipes etc.), communication system (telephon), heating system (in a house, in stabil);
- *Be able to keep a good condition of the infrastructure:*
bases of building work, working wood and producing things made of wood, principles of electrical engineering, introducing of electromontage etc.;
- *Skills for creating missing elements of infrastructure*
For example: building manufactures for processing warehouses for storage. Knowledge of basic of designing and building.

- *Needed skills for woman – to understand working principles of mechanisms for household machines*
For example: machines for processing (milk separator, wool cutting, wool pressing, knitting and sewing machines);

(*)

- *Creation of new additional and necessary elements of infrastructure;*
- *Maintaining above mentioned machines;*

3.1.4. Machinery

- *tractor:*
general construction, maintaining, repairing, technical service, driving, technical safety rules, information on new tractors;
- *general understanding on livestock machines:*
maintaining, building block designs, storing, productive working, to keep technical safety rules;
- *structure and working principles of agricultural machines which are used in the farm:*
general construction, maintaining, repairing, technical service, driving, technical safety rules, productivity, characteristics;
- *Managing and using of machines and equipments:*
acquisition, adjustments, driving trucks and other machines and traffic rules, traffic signs, transportation, operating repair, combination, refilling (seeds, refuelling, spent account materials), knowledge of technology of operations (ploughing, harrowing, hay mowing, crop, alignment, hilling, harvesting, watering, cleaning and drying the seeds, pickling, pressing, cultivation, thinning, shearing, processing of production and etc.);
- *Storage and overhaul:*
criterion of diagnostics (number of kilometres, expiry of the term of a service of details, visual estimation), condition of storage (disassembly before storing, choice of a place of a storage, greasing, broach etc.);
- *Knowledge of other possible alternative ways of purchasing and using a machinery:*
(renting, collaborative using of machinery);
- *Using of alternative small mechanisation:*
and use of horse aggregates, draught of force other animals;
- *bench work and welding;*
- *Electro-sanitary technical montage;*
- *Craftsmanship* (animal shoe, oven making etc.);
- *Conducting economic accounting in using machinery:*
cost price of final production, loss of time, petroleum products, electricity, be able to determine the most effective methods;
- *Keeping machinery safety;*
- *General information on repairing machines;*
- *Welding equipments*
- *Electro-technics*
- *Selection of machinery according to the type of crops*

3.2. Marketing

3.2.1. General skills in marketing

At present time marketing is one of the weak sides of farms. Farmers sometimes are not able to realize their production for profitable price. It means that farmers has to gain following knowledge and skills in marketing:

(* * *)

- *Understanding about marketing;*
- *Objectives and structure;*
- *Selection of proper market and searching scheme;*
- *Ways of distributing and selling the product;*

(* *)

- *Basic understandings about the mechanism of market relations;*
- *Market for need, ways of working with clients;*
- *Knowledge of market;*
- *Searching for potential market;*
- *Understanding about cost price;*
- *Knowledge of principles of price formation;*
- *Knowledge of advertising business;*
- *Getting relevant information;*
- *Able to fulfill requests of the clients;*
- *Able to communicate with people;*
- *Conducting the fixing of expenses and profit (income);*
- *Planning;*
- *Search for the perspective markets and partners;*
- *Able to make contracts and agreements;*
- *Research for competitors (including goods, price), to work with them;*
- *Realization of goods: type of goods, brend of goods, packing, to realize type of goods;*

(*)

- *Price constitution in different markets;*
- *Define the needs;*
- *Cost evaluation;*
- *At retail and wholesale;*

3.2.2. Marketing of mass products

Marketing of mass products as wheat, barley, potato, vegetables, live animals, meat, downs, leather, wool and milk so for realizing these products a „farmer-entrepreneur“ has to know the followings:

(* * *)

- *Quality and condition of his or her product;*
- *Find profitable markets;*
- *Define most optimal level of prices;*
- *Calculating the income and profitability;*
- *Communicate with people and advertise his own product;*

(* *)

- *Rules of the Kyrgyz market;*
- *Learning about international market approach;*

3.2.3. Marketing of special products

(* * *)

Marketing of specific products like kymyz, dairy kymyz, jam, bozo, jarma, butter, milk products (kurut, soft cheese, yogurt, suzmo), shyrdaks, felt, carpet etc. requires from the farmer-entrepreneur:

- *Excellent knowledge of characteristics of goods;*
- *Knowing the market mechanisms;*
- *Knowing profitable markets;*
- *Able to satisfy the demands of clients;*
- *Able to make quality presentation (packaging, design);*
- *Able to make advertisements;*
- *Able to make calculations of income;*
- *Defining an optimal cost of goods.*

3.3. Skills in animal production

3.3.1. Basic skills in animal production

Animal husbandry – is the main branch of farms and agriculture in Issikkol and Chui area, for this reason, a special attention will be paid for in preparing farmers of this branch. Farmers work in the following fields:

- *Sheep and goat breeding;*
- *Big horned cattle breeding (cows and yaks);*
- *Poultry husbandry;*
- *Equine husbandry;*
- *Other fields:*
Honey production, pig, donkey, camel, yaks, wretched nag husbandry

A farmer should have basic understanding in the following areas:

«Farmer-entrepreneur» profession requires main understandings of a few sciences and learn the following knowledges and skills:

- *Zoology* (classification, anatomy of animals);
- *Physiology* (internal structure, principles of biochemical processes);
- *Selection* (knowledge of breeds recommended for Issikkol and Chui region, their qualitative characteristic (period pubescence, resistant to illnesses, productivity and etc);
- *Drawing up balanced ratio, fodders* (concentrated);
- *Preparing various kinds of fodder*;
- *Keeping animals in sheds and stables in fall-winter time* (preparation of stables, sheds, its warming, illumination (light), cleaning, feeding of animals, etc.), *summer-autumn periods* (jailoo, driving the cattle to the pasture,) equipping the place, building yurts, pasturing);
- *Reproduction of animal*;

A farmer-entrepreneur should be able to carry out activities and work like:

- *Births (reproduction) activities*:
preparation of rooms, veterinary service, feeding young animals;
- *feeding*:
preparation of fodder with vitamins, working the regime of feeding;
- *Fattening* (to know the rules of fattening);
- *Castration*:
technique, methods and skills for using tools;
- *Artificial insemination*;
- *Natural insemination*;
- *Getting production* – milking, shearing, butchering the cattle for meat etc.;
- *Storage of forages* – making haystacks, stacking, siloing, cold storage etc.;
- *Accounting an economical efficiency of keeping that or other kind of animals, definition of the most profitable directions*;
- *Using for traction* – horse, donkeys, camels, yaks, wretched nag;
- *Veterinary care of animals* – treatment, sanitary activities (desinfection);
- *Illness prevention and vaccination*;
- *Watching animal's behavior*;
- *Zoo hygiene*;
- *Culling the cattle and criteria of selection* (Productivity, reproductive)
- *Methods of racing animals in pasture*;
- *Manure preparation*;
- *Getting a product* – bone production.

3.3.2. Sheep and goat husbandry

For keeping sheep and goats the farmer-entrepreneur has to know following knowledge and skills:

(* * *)

- *Anatomy and physiology:*
biological structure, period of sexual maturing, physiological processes: digestion, growth, aging etc;
- *Classification of species, breed:*
productivity, stability to illnesses, well adapted to local conditions etc.;
- *Illness prevention:* vaccination, bathing and its techniques;
- *Veterinary processing and treatment:*
sanitary processing against the skin parasites, processing of wounds;
- *Realization of the basic measures:*
births, sanitary processing, feeding the lambs, kids;
- *Insemination* (choosing male-producer);
- *Defining the strategy of development of sheep husbandry on a farm.*

(* *)

- *Evaluation of sheep and goat needs for fodder;*
- *Fodder preparation:*
Digested foddors: hey, rich fodder: heylage; silage, mangel, concentrated foddors – cereal, additional foddors;
- *Feeding:*
preparing high concentrate fodder, making the regime of feeding;
- *Preparing daily ratio (salt, water, fodder, additional matters) according to the growing period;*
- *Dividing to sex age groups* (female sheep, rams, young);
- *Keep them in summer pasture:*
equipping the sheds and stables, animal racing technique;
- *Culling the lambs:*
criteria of choosing productivity, visual evaluating;
- *Fattening (preparing high concentrate fodder, making the regime of feeding);*
- *Butchering the animals:*
be able to cut the body, defining the quality of meat, recognizing parts of body, storing meat, hygiene and working skin;
- *Keeping in winter time:*
equipping the sheds and stables, organizing the winter pasturing, feeding;
- *Defining economical efficiency:*
prime cost of meat, wool, down, other productions (skins, humus);
- *Calculation for ratio, fodder and uncome and outcome;*
- *Making a production plan;*

(*)

- *Milking, shearing:*

using an equipment, be able to use the technique of shearing, evaluating the wool, pressing the wool;

- *Watching animal's behavior;*

3.3.3. Cattle husbandry

A farmer-entrepreneur has to have the following skills and knowledge:

(* * *)

- *Anatomy and physiology of Cattle:*
biological structure, sex growing period, physiological processes: peculiarities of digestion of cows, working of milk gland etc.;
- *Classification of species, breeds:*
productivity – milk, meat, meat-milk breeding, stability to illnesses, well adapted to local conditions etc;
- *Making daily ratio according to sex and age;*
- *Deasease prevention (vaccination);*
- *Veterinary processing and treatment:*
vaccination, sanitary processing against skin parasites, wounds processing;
- *Carrying out main and important activities:*
births, sanitary processing, feeding calves;
- *Insemination (choosing a bull-producer);*
- *Butchering the animals:*
Slaughtering, cleaning the intestines, able to cut the body, recognize the parts of the body, evaluate the quality of meat, keep hygiene, to store the meat, working skin;

(* *)

- *Knowledge of bull breeds and species-producers:*
criteria of their evaluating - productivity, visual evaluating: structure, muscles, parameters of the body;
- *Basics of fodder production;*
- *Feeding:*
preparing calorie fodder, defining a regime of feeding;
- *Culling the calves:*
criteria of choosing the productivity – milk, meat, meat-milk breeds, visual evaluating;
- *Fattening (preparing calorie fodder, defining a regime of feeding);*
- *Keeping in winter time:*
equipping the shed, water for animals, organization of winter pasturing, feeding, storing fodder;
- *Accountancy of ratios, fodder, forages, all the expenses, income;*
- *Making strategy for cattle husbandry in a farm.*

(*)

- *Animal breeds observance;*
- *Preparing most eatable fodder:*

concentrated fodder - cereals, composed juicy (hay stacks, silo, fodder beets, fodder additives);

- *Milking* (having a regime for milking, techniques and hygiene of milking);
- *Evaluating the quality of milk* (temperature, pH, fatness, content of nutrition);
- *Driving to summer pastures* (equipping a shed in jailoo, techniques of pasturing);
- Techniques of pasturing and watching for the yaks;
- *Increase the efficiency and methods of raising animals:*
Criteria of evaluating the pastures: density, height, diversity of grass, methods of increasing quality: watering, additional fertilizing etc;
- *Using criteria of evaluating the pastures:*
density, height, diversity of grass, methods of increasing quality: watering, additional fertilizing etc;
- *Watching animal's behavior;*
- *Determine the economical efficiency:*
prime cost of 1 kg of meat, milk, other products (skin, dung);
- *Records for income and outcome;*
- *Cattle marketing;*
- *Make up production plans;*

3.3.4. Poultry

For poultry husbandry «Farmer entrepreneur» has to have the following knowledge and skills::

(* * *)

- Biology and physiology of domestic poultry (biological constitution, physiological processes: digestion and etc);
- Classification of breeds: productivity – egg laying, meat, disease resistance, well adapted for local conditions etc
- Disease prevention (vaccination);
- Building an incubator and using it (know the principles of raising of baby birds);

(* *)

- Making the daily fodder ratio;
- Butchering the poultry (able to cut the body, and evaluate the quality of meat);
- Setting the raising strategy of poultry.

(*)

- Preparing digestible fodder and forages (concentrated fodder- cereals, fodder additives;
Organizing the pastures: fencing so to protect from predators, use the place where eatable plants are available;
- Feeding: prepare high quality fodder, keep the feeding rules;
- Observe the behavior of poultry;
- Equipping the poultry-yard (warming, heating, artificial light)
- Using bio-incubator (use broody hen);

- Processing of poultry feather;
- Determine economical efficiency (prime costs of meat, eggs and other products (manure))
- Keeps the recording of expenses/costs and income;
- Conduct the account of ratio, forages, all expenses, and profits;
- Makes a production plan;

3.3.5. *Equine husbandry*

For equine husbandry «Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Anatomy and physiology of horses: biology structure, period of sex growth, physiological processes: digestion etc;
- Classification of species: constitution, resistance for illnesses, well adapted to local conditions etc;
- Bases of selection: choosing producers and criteria of culling, offspring, visual evaluating)
- Disease prevention (vaccination);
- Veterinary activities and treatment: sanitary processing against the skin illnesses wound treatment, diagnostics of diseases and treating them.
- Carrying out main activities: births, sanitary measures and feeding the young foals,
- Culling the young equines - criterion of selection, a visual evaluation;
- Feeding: prepare high quality fodder and keeps the feeding rules;
- Slaughtering the animals: gutting, cutting according to bones allocation, know the parts of the body, meat quality identification, keep hygienic rules, meat storage, skin processing;

(* *)

- Makes daily fodder ratio;
- Horse tying and horse temperament identification;
- Observation of horse behavior;
- Keeping the animals in winter time: equipment of the shed, organization of winter pasture and additional feeding)
- To determine an economic efficiency (prime cost of meat, other productions (skin, kymyz);
- Keeps the recording of expenses/costs and income;
- Conduct the account of ratio, forages, all expenses, and profits;
- Set the strategy of development of equine husbandry on a farm;

(*)

- Preparing young horses (racers) – training etc;
- Use horse for farm work (small mechanization, use as a transportation);
- Feeding the foals;
Preparing most digestible fodder for horses: concentrated forages, combined, juicy fodders, fodder additives;

- Dividing into groups according to sex and ages;
- Milking: rules of preparing kymyz;
- Drive to summer pastures: setting the shed on the pasture places, pasturing techniques;
- Makes production plan;

3.3.6 *Bee keeping (for limited farms only)*

For bee keeping «Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Bases knowledge of the nature of bees, organization (worker-bees, drone, queen, male and female), seasonal behavior changing of bees;
- Raise up a queen and separate her apart from others;
Main requirements for getting much quantity of honey production (presence of nectar flowers, plants, period of flowering etc);
- Allocate beehives correctly and feed them with the additional food when it is needed;
- Harvesting and storing, honey processing;
- Preparation for the winter (filling of fodder stocks, autumn escalating of bees, building the nests etc.);
- Precautionary work on struggle with illnesses of bees, destructing the wreckers;

(* *)

- Move and look along the territory (search for honey gathering massifs);
- Sanitary processing of nests of bee families;
- Expansion of nests;
- Preparation of frames;
- Defining a strategy of developing beekeeping in a farm.

(*)

- Influence of bees to the environment;
- Fine operating repair of beehives, beehive frames and diaphragms, repairing the working and portable boxes;
- Conducting the industrial and economic account;

3.3.7. Pigstry

For pigstry «Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

Anatomy and physiology of pig: biological structure, period of sex growth, physiological process, digestion etc;

- Techniques for increasing the number of pigs;
- Feeding and keeping;
- Veterinary activities/preventive measures;
- Carrying out main activities: matting, birth, butchering, castrating;

(* *)

- Products of pig;

(*)

- Prepare stable for pigs and piglets;
- Slaughtering/butchering the pig, give for meat and process the skin;
- Calculation of costs and income;

3.2.8 Other animals (for limited farms only)

Other animals, in which farmers are interested in agriculture, are the donkeys, camels, and rabbits. For these animals «Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- General information on anatomy and physiology: biological structure, period of sex growth, physiological process, digestion etc;
- Carry out the treatment and vaccination activities;

(* *)

- Follow the sanitary measures;
- Feeding ;
- Mating activities;

(*)

- Use these animal in farm activities;
- Shearing (camels);
- Wool processing;
- Castration;
- Skin processing.

3.3.9. Zoo veterinary

For zoo veterinary «Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Agricultural animals anatomy and physiology;
- Agricultural animals contagious illnesses;
- Agricultural animals internal contagious illnesses;
- Midwifery, gynaecology and artificial insemination of agricultural animals;

(* *)

- Surgery;
- Pharmacology;

(*)

- Micro biology;
- Zoo techniques

3.4. Skills for plant production

3.4.1. Basic skills in plant production

As it's pointed in the beginning of Competence Profile , natural-climatic conditions of Chiu and Issikol region were taken into account and the following cultures and spheres are identified:

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Cereals (wheat, barley, oats, raps, black millet, maiz, peas, linen/flax);
- Potato;
- Fodder plants (yearly and perennial grass, rocket-cress);
- Gardening (apples, pear, plum, apricot (seed), raspberry, blackcurrant, strawberry, blackberry, peer, cherry, sea-buck thorn, cherry, jiyde)
- Plant for producing oil (sunflower, sufflower)
General understanding of selection of plants (variety selection and characteristics);
- Basics of nurishing;
- Basics of entomology
General understanding of agronomical concepts (duration of vegetation period, sum of yearly precipitation, sum of positive temperatures, annual sum of deposits, biological and economic maturity etc.);
- Basic understandings of increasing the productivity of soil (understanding of crop rotation principles and using it, preparing organic fertilizes- humus);
- Correctly implementation of main technological operations:
Ploughing, raking/harrowing, seeding/planting, cultivation, watering, nurishing, collecting/harvesting, chemical protection etc;

- Basis of soil science (able to evaluate visually the quality and condition of soil)
- General idea of illnesses and wreckers of agricultural plants and crops and methods of protection and prevention;
- Ability to deal/use the agricultural machineries;

(* *)

- *Vegetables* (union, garlic, red beet, carrot, cabbage, tomatoe, cucumber, dill, jusay, turnip, hot pepper, aubergine, pumkine, patesson, horse-raddish);
- Basics on plants biology and physiology: structure of leaf, root and fruit; main biochemical process: photosynthesis;
- General understanding of batanical classification;
- Understanding the concept of organically intergrated products;
- Basics of climatology - external conditions like dry weather and other similiar natural phenomenon;
- Understanding about usefull insects;
- Able to identify the plant needs: irrigation, sun ray, nitrogen, phosphorus, micro elements and nourish according to identified needs;
- Carry out economical calculation of plant production effectiveness and rentability (profitability);
- Carry out all costs calculation and accountancy;
- Make financial documentation and technological calendar.

3.4.2. *Cereals/grains*

Cereals are grown that to use them in two ways: as a fodder and as a food product.

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Choosing the seed material (sort qualities, characteristics: Productivity, stability for drought, low temperatures, continuation of the vegetation period till the technical ripening, resistance for illnesses and wreckers, pests.);
- Preparing the seeds for seeding (cleaning, pickling);
- Choosing optimal terms of seeding;
- Organize the crop rotation;
- Know methods of struggling with wreckers, pests, weeds
- Know technology of cleaning and drying;
- Accounting the expenses, income
- Accounting prime cost and crop yield
- Writing a technological calendar;

(* *)

- Doing technical operations::

- ✓ Making the scheme of crop rotation (choosing the field);
- ✓ cleaning;
- ✓ spraying the organic fertilizer;
- ✓ Watering for keeping moisture
- ✓ Flattening;
- ✓ spring Ploughing;
- ✓ Autumn Ploughing;
- ✓ Making mini canals

- ✓ Early spring harrowing for keeping moisture,;
- ✓ Seeding (defining the norm of seeding, regulating the seeder machines),
- ✓ Technical operations against weeds (weeds, pesticides, fungicides)
- ✓ Nourishing (define norms of nourishing and apply these methods correctly);
- ✓ Irrigation (define norms and timing, winter tillage);
- ✓ Gathering (skills for regulating the combines)
- ✓ Hilling the channel
- ✓ Evaluating the quality of seed (size, content of gluten, thickness of the wheat, dockage of grain) and evaluating the harvest (productive, fodder grain, seed grain)

- Know to produce new, quality, clean and new sorts of seeds;
- Storing the grain (know conditions, (wet, pests) of storing the grain

- Using correctly the means of mechanization
- Using possible alternative options of mechanization (small mechanization)
- Determine the plans for the next year
- Melioration
- Whitewashing of sour and salty soils
- Drying swamp places;

3.4.3. Potatoes

Potatoes are grown in the order to be used them in two ways: as a fodder and as a food product

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Biological properties of potatoes (vegetative reproduction, degeneration process);
- Evaluating potatoes' varieties (size of a tube, period of technical maturity: early maturing, middle maturing, late maturing, taste qualities etc)
- Abilities for defining the quality of soil and requirements for culturing potatoes (enough content of humus, granular structure of soil, pH and etc)
- Place in crop rotation;

- Cost and expenses calculation;
- Calculation of prime cost and yield productivity;
- Making/writing technological calendar;
- Determine plan for the next year;
- Melioration activities;

(* *)

- Know technology of growing:
 - ✓ Spraying fertilizers;
 - ✓ Ploughing before winter the land to make the land frozen with water, 27-30 centimetre in depth;
 - ✓ Early spring harrowing
 - ✓ Make crop rotation scheme (choose the filed);
 - ✓ Cultivate the land (ploughing, harrowing/raking, flatting, make rows);
 - ✓ Planting (distance between rows);
 - ✓ Weeding, make the soil softer;
 - ✓ Irrigation (define norms and time,);
 - ✓ Additional nutrition (“Sherbet suu”)
 - ✓ Hilling;
 - ✓ Protecting from pests, illnesses and diseases, weeds, (chemical, mechanical, and biological ways of protection)
 - ✓ Criteria of evaluating the tubes (sizes, flatness of the surface);
 - ✓ Harvesting the yield;
 - ✓ Sorting
 - ✓ Rules of laying for storage
- Understanding about virus free seeds: multiplication by vegetation method; quality of seed materials: super elite and further next reproduction;
- Learning about new, with good quality and fruitful (yieldful) seeds sorts (eg: local condition adapted Picasso, Holand, Cardinal, Siberian etc..);
- Planting time and methods;
- Selecting of seeds for planing and prepare for planting (prepare the varieties, spring adapted variety);
- Rules of storing (prepare the place for storing the potatoes);
- Use correctly mechanization tools;
- Using possible alternative options of mechanization (small mechanization)
- Know ecological protection

3.4.4. Fodder production

According to classification fodder is divided into concentrated, juicy, dried, combined fodders. Main fodder cultures are sainfoin, lucerne, natural grass.

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Fodder varieties
 - Know the botanical properties of main fodder cultures
 - Role and place of fodder cultures in crop rotation (enriching the soil with nitrogen)
Have an idea of biochemical content of fodders (correlation of assimilated elements of – nutrients, fats, microelements, and non assimilated –cellulose);
 - Prepare the seed (cleaning);
 - Define the optimal time for seeding;
 - Performing technological operations:
 - ✓ Ploughing;
 - ✓ Early spring moisture harrowing
 - ✓ Seeding (defining norms of seeding, regulations of the seeder machinery)
 - ✓ Technical operation against weeds;
 - ✓ Nourishment and additional nourishment
 - ✓ Watering (skills for defining the time of watering)
 - ✓ Mowing, drying, pressing
 - Know methods of pest control, pests, weeds, (early spring harrowing, disking)
 - Harrowing, discing etc in early spring
 - Cost and income calculation
 - Calculation of prime cost and productivity
 - Making technological calendar
 - Develop plans for the next years.
- (* *)
- Distinguish natural and artificial sources of fodder (pasture, grass growing);
 - Define the quality of the fodder: validity, storing period
 - Level of consumed fodder by livestock;
 - Know most optimal terms of preparation (phase of budding, flowering)
 - Understanding of the balanced fodder
 - Technology of laying juicy fodder
 - Technology of growing fodder cultures;
 - Evaluating the quality of the fodder (smell, color, content of protein, etc)
 - Storing fodder (stacking, laying in the trench, hilling)

(*)

- Level of digestion of the fodder for animal;
- Cutting (by hand and by using the machinery);
- Flattening;
- Use the possibility of the machinery
- Using possible alternative variants of mechanization

3.4.5. *Vegetables*

Issyskol and Chui regions characterized favourable for growing vegetables. Main vegetables are the followings: onion, garlic, cabbage, carrot, red beet, cucumber, tomatoe, turnip, dill, juzay, pepper, red hot pepper, aubergine, patesson, pumpkin, horse-raddish etc.

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Organization of the farmland (laying out, fertilization, crop rotation, cleaning water canals)
- Sort qualities: productivity, times of ripening, stability to low temperature, resistance against pests and diseases etc;
- Protection from pest;
- Protection with the chemical ways
- Provide additional nutrients
- Knowledge of terms of seeding and planting the seedlings
- Evaluation of seeds and their preparation (germination, thickness, soaking)
- Seeding (scheme of seeding, deepness of putting seeds)
- Cost and income calculation
- Calculation of prime cost and productivity
- Making the technological calendar
- Develop plan for the next year

(* *)

- Know the basis of vegetable growing in closed places (hotbed, green houses) or in fenced places;
- Growing seedling in fenced places;
- Know the technology of each culture:
 - ✓ Cultivate the land (ploughing, soften the land, harrowing, planning etc.);
 - ✓ Building places for simple hot bed and places for preparing of seedlings
- Planting seedlings in open air place (planting scheme):
 - ✓ watering;
 - ✓ hilling;
 - ✓ softening (airing);
 - ✓ Methods of plants protection (chemical, mechanical, biological)

- Nourishment (defining kinds of nutrition needed, learning about nourishing methods, additional nutrition)
 - Plants protection methods (chemical, mechanical, biological)
 - Hasverting the yield (evaluation, sorting out);
 - Put into storage;
 - Storing the seeds;
 - Using all necessary aids of mechanization
 - Using possible alternative options of mechanization (small machinery)
 - Melioration activities
 - Aware for ecology protection;
 - Mushroom growing at home condition
- (*)
- Tempering the seedlings (working for a short time with low positive temperature)

3.4.6. Horticulture

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Knowledge of biology of fruit and berry cultures (properties of structure, root system, flowering and bearing fruit)
- Basic understandings of sort qualities of cultures (frost- resisting, adapted to the local condition, harvest, productivity and resistance against pests and disease, taste etc);
- Properties of reproduction (vegetative way)
- Technique and terms of engrafting
- Cost and income calculation
- Calculate prime cost and productivity
- Make the technological map
- Develop plan for the next year.

(* *)

- Organizing and working with nursery (choosing female plants)
- Laying out the garden (schemes of planting, fertilizing)
- Useful ants (insects)
- Protect from erosion;
 - ✓ Moisture watering

- ✓ Winter cuttings, cleaning the apple tree (crown)
- ✓ Softening the roots, spraying the fertilisers
- ✓ Measures against pests, diseases
- ✓ Harvesting (visual evaluation and sorting)
- ✓ Prepare for storage (know storing conditions);

(*)

- Growing fruit trees seedlings (nursery)
- Basis of growing technology
- Using bees for pollination
- Using possible alternative variants of mechanization (small machinery)
- Using all necessary aids of mechanization

3.4.7. Other cultures

Other cultures farmers are mostly interested in are: fooder beet, peas, raps, oil flax, green peas, saf-flower.

«Farmer entepreneur» has to have the following knowledge and skills:

- Know main botanical properties of these plants
- Varieties identification
- Main requirements for moisture, light, water etc
- Technology of growing these cultures
- Crop rotation
- Nourishing the land
- Processing
- Using all necessary aids of mechanization
- Using possible alternative variants of mechanization (small machinery)
- Cost and income calculation
- Calculate prime cost and productivity
- Make the tehcnological calendar
- Develop plan for the next year

Maize

(* * *)

- Seed preparation (cleaning, treatment)
- Prepare land for planting

- Define timing for seeding and seeding
- Agronomical operations against weeds
- Harvesting, storage, selling.

Oil plants

(* * *)

- Selecting seeds according local condition
- Seed preparation, cleaning
- Define seeding norms
- Nourishing and additional nourishing;
- Agronomical operations against weeds
- Cutting, collecting;
- Press the oil (processing)
- Storage and selling.

Flower

(*)

- Selecting flowers according local condition/climate
- Seed selection
- Prepare land for planting (harrowing, flatting)
- Seeding and planting
- Weeding
- Perform timely watering
- Seeds collection for the next year
- Selling flowers.

3.4.8. *Technical plants*

«Farmer entrepreneur» has to have the following knowledge and skills:

Sugar beet:

(* * *)

- Know biological characteristics
- Prepare seeds for planting
- Know the norms and methods of planting
- Correctly tillage and ability to cultivate the land;
- Taking care, additional nutrients

- Chemical protection
- Methods watering norms maintenance
- Harvesting.

Legumes – soy, peas, beans, chick-pea, pea everlasting (Lathyrus), vetch etc.

(* *)

- Define timing for planting
- Prepare land for planting
- Carry out crop rotation
- Prepare seeds for planting
- Seeding (define the norms)
- Nourishing
- Taking care of plants
- Protecton with chemicals
- Technical operation against weeds
- Timely watering
- Harvesting, selling.

3.5. Skills for food processing

3.5.1. Basics of food processing

Product processing plays and takes an important role and place in «Farmer entepreneur» professional skills. Processing and correct storage gives a number of advantages:

«Farmer entepreneur» has to have the following knowledge and skills:

(* * *)

- Know the characteristics of the product (biochemical content, calorie and nutritious, the product's quality);
- Know main methods of processing and storing (dehydration, pH, sterilization, cold storage)
- Term of storage
- Know rules of hygiene and sanitary
- Follow safety measures while processing

(* *)

- Increasing of income by selling (processed) finished commodity
- Know basics of microbiology and processes caused by the live activity of bacteria (fermentation, oxidation etc)
- Define costs and conduct accountancy

(*)

- Sells his/her products in winter time when the products will be expensive
- Makes condition to supply market and provide consumption of his family whole year around with his/her produced goods
- Provides risk prevention in marketing
- Know making calculations of the efficiency and profitability of making products
- Know to write and conduct financial documentations and technological calendar

3.5.2. Milk processing

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Technique of milking (keeping all the conditions of sanitary)
- Qualitative content of milk (temperatures, pH, content of fat, proteins)
- Clean and sterilize dish where milk is stored
- Basics of milk-lactic acid fermentation (basics of microbiology)
- Knows the basis of cheese, cream, sour cream making

(* *)

- Basics of traditionally made Kymyz Uy-kymyz Suzmo, kurut curd (chnach, bishkek – special things for making kymyz)
- Making kyrgyz national foods: airan, suzmo, kurut, ejigey, bishtak
- Able to use appropriately tools for milking cows
- Packaging of milk products and rules for storing
- Knows methods for ice-cream, cocktail making
- Knows the basis of yogurt, kefir making
- Knows the condition for storing (terms, temperature);

(*)

- Calculation of costs spent for milk processing
- Price building and income evaluation

3.5.3. *Vegetables and fruit conservation*

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Know criteria of choosing and sorting fruits and vegetables
- Learning about digestion and usefulness
- Know main methods of processing and storing (sterilization, drying, acid, cold storage), know their good sides and bad sides
- Knows technology of fruits and berry drying at home condition
- Able to work with equipment for processing and knows new processing technical machines
- Knows storing condition and terms

(* *)

- Vegetable conservation, marinades, salting, salads
- Storing of conservants and packaging
- Conservation of fruits (fruits, compot, jam. tomatoe);
- Processing of natural plants as see-buckthorn, wild rose, wild black current

(*)

- Calculation of costs
- Price building and eveluation of income

3.4.4. *Oil plants processing*

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Learn to define oil plants quality
- Knows composition of oil plants
- Storing of produced goods, put into dishes

(* *)

- Follow sanitary and hygenic rules and conditions
- Correctly usage of energy
- Define the prices of product and make calculation

3.5.5. *Cereals processing*

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Produce flour, akshak, adyaa, ugut and other products from cereals
- General technology of cereals processing: bread, buns, boorsok, tokoch, jarma, maksim, bozo
- Obtain the skills on producing the confectionery (biskuits, sweat bread, cake, buns, rolls, chak-chak, sansa))
- Knows storage terms and conditions;
- Knows how to assess the quality of bought products: taste, fat content, fermentation, boiling/frying;
- Knows chemical composition of cereals;

(* *)

- Choose optimal sources of energy
- Calculation of costs
- Price building, evaluation of income

(*)

- Make kyrgyz national products: kalama, kattama, boorsok, komoh bread, jupka, kuymak
- Processing of vegetable oil (weeds, oil cake);
- Knows terms, conditions and how to store starch products

3.5.6. *Meat processing*

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Knows how to slaughter animal and cutting the body into pieces
- Knows how to evaluate the quality of meat and divide into pieces according to values

(* *)

- Know basics about meat conservation (boiling, drying, sausages, cold storage)

(*)

- Have skills in preparing and storing traditional products (chuchuk, byjy, jorgom etc.)
- Storage and packaging of conserved products
- Calculation of spent costs
- Price building and evaluation of income

3.5.7. *Wool processing*

«Farmer entrepreneur» has to have the following knowledge and skills:

(* * *)

- Knows general technology
- Know how to evaluate the quality of products

(* *)

- Able to work with the equipment are needed for processing
- Makes kyrgyz traditional products

(*)

- Produce different kind of products
- Know how to store products
- Selling in the market
- Costs calculation

3.5.8. *Other branches in processing*

(*)

- Biohumus
- Work with biogas
- Get understanding on packaging machine

3.6. **Skills for handicraft and household**

3.6.1. *Household management*

Needed skills for household:

- Able to do planning the time and organize work
- Able to equip her own working place (*comfortable, clean, light in the room, space*)
- Able to use all tools and equipment which are at home
- Know all Kyrgyz traditions
- Know the etiquette and culture of communication
- Have skills in receiving and serving guests
- Keep sanitary norms

3.6.2. *Human nutrition*

For organizing the right human nutrition in the family she has to know the followings:

- Needs of human (making ratio for a balanced nutrition)

- Know caloty of foods
- Know vitamine content of food
- Know how to make national foods
- Know basics of cookery
- Designing the table
- Know social rule of the society
- Abilities in First Aid
- Able to make, cook traditional dishes

For correct educating and brining up the children for their knowledge she has to know the followings:

- Basics of pedagogy and human's psychology
- Have ideas in literature, nature, and music
- Able to communicate with children: accuracy, respect and cultural rules

3.6.3. Handicrafts

For handicraft following knowledge and skills has to obtained:

- Know properties and quality of materials and threads
- Know basics of designing, Kyrgyz tradition of handicraft in particular how to use Kyrgyz patterns
- Able to work sew clothes (looms, sewing machines)
- Work with dyes, select the colour
- Remaking old or spoiled cloth (make clothes smaller or bigger)
- Recognize Kyrgyz patter: reflecting nature, plants and animals in pattern
- Booz uy making (wood, kiyiz etc.)
- Kiyiz making (autumn, spring wool etc)
- Ormok making
- Skin processing
- Wool processing (cleaning, tarding, heating, weaving);
- Skills in production of shyrdak, kiyiz, kurjun, kalpak, tush-kiyiz and other souvenirs.
- Ability in evaluating the quality of products
- Ability to work with needed machines (sewing, weaving etc.);

- Wool, skin processing and evaluating
- Cost calculation

4. «Farmer entrepreneur» profile

«Farmer entrepreneur» as an independent entrepreneur is working at the farm that belongs to him/ her. He/ she is capable to run his/her farm and has all above mentioned skills and knowledge. He/ she can address adviser when it is needed. He/she defines on his/her own practical activities, strategy and needed plans. Knows needed sources for information. Exchange his/her working experience and pursue different branch farming activities:

- ✓ Agricultural production
- ✓ Infrastructure
- ✓ Use any kind of machinery
- ✓ Processing
- ✓ Marketing