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Diploma Thesis

The Agricultural Marketing Information System (AMIS) Impact Assessment in Rural Areas of the Republic of Moldova

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DECLARATION OF AUTORSHIP

I, Alena Švarcová, confirm that this Diploma Thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and that, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of this Diploma Thesis.

In Prague, April 2013

Signature…….

Alena Švarcová

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ABSTRAKT

Účelem práce bylo posoudit vliv Zemědělského marketingového informačního systému (AMIS) na pozici malých a středně velkých zemědělců na lokálních trzích ve třech konkrétních regionech Moldávie (Anenii Noi, Telenesti, Singerei).

V první fázi výzkumu byla provedena důkladná analýza již známých materiálů a dat použitých k tvorbě a fungování AMISu. Následně byla vytipována konkrétní skupina uživatelů AMISu v daných oblastech, od kterých byly získány informace pomocí dotazníkového šetření spojeného s rozhovory přímo v terénu. Dotazník byl zaměřen na sběr dat v těchto cílových oblastech: zemědělská výroba; množství produkce; tržní trendy; nabídka a poptávka; konkurenceschopnost; míra využití informačního systému. Celkem bylo shromážděno 87 dotazníků a všechny bylo možné zařadit do výzkumu. Úspěšnost sběru dat byla tedy stoprocentní.

Výsledky dotazníků odhalily, že z celkového počtu respondentů zná AMIS 72% a plně ho využívá 66% zemědělců. Dotazovaní dále potvrzují, že jim AMIS pomohl v průměru zdvojnásobit produkci, a tedy i navýšit výdělky přibližně o 50% v závislosti na cenách lokálních trhů. Mezi nejcennější informace, o které mají farmáři zájem, patří: užívání nejnovějších technologií týkající se setí, sklízení, zavlažování, hnojení; možnosti přístupu na trh a aktuální ceny jednotlivých produktů; informace o marketingových strategiích. 83% respondentů shledává AMIS celkově prospěšným a souhlasí, že má pozitivní vliv na malé a středně velké zemědělce a jsou ochotni využívání AMISu doporučit dále.

Dotazníkovým šetřením bylo také prokázáno, že farmáři mají zájem o další vzdělávání v různých odvětvích. Právě AMIS je vhodným nástrojem k získávání informací, které poptávají. Problém spočívá v tom, že velké množství farmářů tento systém stále nezná nebo neví jak ho plně využívat. Z tohoto důvodu je doporučeno zvýšit povědomí o AMISu mezi farmáři pomocí: většího množství vyškolených konzultantů, kteří budou schopni předávat potřebné informace; reklamních kampaní v podobě letáků a plakátů distribuovaných v cílových oblastech (popřípadě multimediálních kampaní); otevření nových školících a poradenských center.

Klíčová slova: Moldávie, Anenii Noi region, Telenesti region, Singerei region, zemědělský marketingový informační systém, zemědělská produkce, lokální trhy

ABSTRACT

The purpose of the work was to assess the impact of the Agricultural Marketing Information System (AMIS) on the position of small and mid-sized agricultural businesses on local markets in three concrete districts of Moldova (Anenii Noi district, Telenesti district and Singerei district).

In the first phase of the assessment, an exhaustive analysis of known data and materials utilized for the implementation and maintenance of the AMIS system was conducted. Subsequently, an AMIS user group was targeted in the aforementioned regions, from which key information were obtained using questionnaires combined with interviews in the field. The questionnaire was aimed at collecting data in the following key areas: agricultural production, production volume output, market trends, supply and demand, competitiveness, and the usage of the information system. Overall, 87 questionnaires were collected and all were deemed adequate to be utilized in the assessment. The data collection was therefore deemed to be complete.

The results of the questionnaires indicated that 72% of the respondents are aware of the AMIS system, and 66% are utilizing it to its full extent. The respondents also confirmed that the AMIS system assisted them in doubling their production on average, and thus increase revenue by 50% relative to applicable prices in local markets. What farmers are considering being most useful information include: utilizing newest technologies concerning sowing, harvesting, irrigation, fertilization, market access, current pricing of individual products, and information pertaining to marketing strategies. 83% of respondents find AMIS useful overall, and confirm that the system has a beneficial impact on small and mid-sized agricultural businesses and are willing to recommend the usage of the AMIS system to others.

The questionnaire furthermore indicated that farmers are interested in further education in various areas. AMIS is deemed an appropriate tool to provide the information farmers seek. The challenge is that many farmers are yet unaware of the system, or how to fully utilize it. For this reason, it is recommended to increase the awareness of AMIS among farmers by: increasing the number of trained consultants, who will be able to disseminate needed information, marketing campaigns utilizing leaflets and posters, distributed in the targeted regions (additionally, potential multimedia campaigns), and the establishing of new education and consulting centers.

Key words: Moldova, Anenii Noi district, Telenesti district, Singerei district, agricultural marketing information system, agricultural production, local markets

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LIST OF ABBREVIATIONS

ACSA	National Agency for Rural Development
ADB	Asian Development Bank
AMIS	Agriculture Marketing Information System
CEE	Central and East European and Baltic State
CIS	Commonwealth of Independent States
CULS	Czech University of Life Sciences Prague
DCCZ	Development Cooperation of the Czech Republic
FAO	Food and Agricultural Organization of the United Nations
FAOSTAT	Food and Agricultural Organization of the United Nations, Statistic Division
FYR	Former Yugoslav Republic (FYR Macedonia)
GDP	Gross Domestic Product
HDI	Human Development Index
IMF	International Monetary Fund
ITS	Ibformation and technology Services
MD	Republic of Moldova
MDGs	Millenium Development Goals
MIS	Marketing Information System
NGOs	Non Governmental Organizations
NNS	National News Service
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
SCERS	Strategia de Crestere Economica si Reducere a Saraciei
UN	United Nations
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USSR	Union of Soviet Socialistic Republics
WB	World Bank

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1. INTRODUCTION

Due to disintegration of Soviet Union (whole name was Union of Soviet Socialistic Republics), which took place at the end of 1991 (26. 12. 1991), total of 15 countries (Veber 2011) gained independence. Each of 15 post-soviet republics had economic trouble, which occurred during transition from centrally planned economy to free market economy. This thesis concentrates on Moldova, one of the poorest post-soviet republic. It originated 27. 8. 1991 by stating its independence (Film DCCZ, 2009). After more than 20 years Moldova still struggles to work itself up after splitting from Soviet union and even today its economic situation is not good. High unemployment rate, low wages, people living at the threshold of poverty, underdeveloped infrastructure (Chamber for Commercial Relations with CIS, 2012) etc. all these things lead to depreciation of living standards, especially in the countryside regions, where income differences are more pronounced.

Country region inhabitants focus mainly on agricultural production which is one of little chances to obtain money in Moldova, if they do not want to work abroad or emigrate. As far as Moldova agriculture and agricultural trade is concerned, fundamental question pops up. Is moldavian agricultural sector already fully saturated and exploits all its potential, or is there a way to accomplish better results?

Opportunity presents itself through Agricultural Marketing Information System to aid life standard of moldovans. Nowadays, demand for information and services related to providing information increases. In case of Moldova and Moldovan agriculture demand increases for both information and consulting services.Thru agricultiral marketing information system and network of consultants who were provided by ACSA agency (National Agency for Rural Development) oportunity provides itself to help increase standard of living of Moldovas inhabitants.

Providing necesary information aimed mainly at new technologies used in agricultural sector, information about prices at the local Moldova markets but also advice about cropping, planting, fertilising, harvesting and storage of production can help development of agricultural sector mainly in rural areas where there is lack of these information. According to Basheer (2010) “in today’s knowledge-based society”, development of good information can provide to the company advantage over competitors.

Information technology develops very quickly and it is necessary to keep up. Permanent feed of different information from proven sources is essential for building better trade. Agricultural Marketing Information System is meant for small and middle farmers at the local markets.

2. LITERATURE REVIEW

2.1. Facts About the Republic of Moldova

Moldova is located in the southeast Europe. It is a continental state. In the north, east and south it shares border with Ukraine and total length of the border is 939 km (Chamber for Commercial Relations with CIS, 2011). On the west side is 450km long border with Romania (Chamber for Commercial Relations with CIS, 2011). All three states are situated in the temperate belt. The terrain is predominantly hilly, but there are also alluvial plains and the valleys of rivers which flow into the north-east corner of the Black Sea. Total area is 33 843 km^2 + 4 163 km^2 of the separatist area Transnistria. Capital is Chisinau, which according to latest totals accommodates population of approximately 752 000 (Chamber for Commercial Relations with CIS, 2011).

Due to problematic relationship of Moldova republic with Transnistria exact count of inhabitants is not known. Indicated numbers differ greatly from one another and because of dynamic of migration of Moldova population, respectively in moldovan data and those of international organizations. It is also important to note if population of Transnistria is counted in or not. Data publicated by Chamber for Commercial Relations with CIS 1. 1. 2009 states - without Transnistria - 3 569 milions permanent inhabitants of Moldova republic, from which 1 476 milions live in cities and 2 092 milions in the countryside (Chamber for Commercial Relations with CIS, 2011). Transnistrian authorities state total of 555 000 inhabitants, World Bank states 4 205 milions of inhabitants for the end of 2005 (Chamber for Commercial Relations with CIS, 2011). Authorities and institutions responsible for population census admit that due to aforementioned seasonal migration, it is not in their power to clearly state exact number of inhabitants.

The Republic of Moldova is one of the fifteen post-soviet republics which inherited many problems and little advantages after the Soviet Union broke apart. Together with Albania it is the poorest country in Europe. GDP per inhabitant was only 2 128 USD in 2011 or 3 540 USD in buying power parity (Global Finance, 2011). More than 30% of its inhabitants live under poverty treshold. Moldova's HDI (Human Development Index) is 0.649 and puts the country on 111 st. place among 187 other states (UNDP, 2011). HDI values are equal to poor african regions (UNDP, 2011). Agriculture is dominant sector of country's economy and contributes 33% of GDP and 65% of export (UNDP, 2011). It is caused by temperate zone and very fertile soils, but also by absence of other natural resources apart from farmland such

as energetic resources. Main problems of today's moldavian agricultural sector which are slowing down agricultural production which is main export component of moldova's foreign trade are (Blanchflower, 2001, Lupu, 2004):

- Unemployment;
- Lack of financial sources (Blanchflower, 2001);
- Lack of marketing and information resources;
- Unqualified labour;
- Slow modernisation of agro-food complex;
- Low productivity and quality of products;
- Unadvanced production base with inadequate interest (Lupu, 2004).

There is not enough attention paid to traditional products (except wine production), neither to their international protection and marketing. Beside that, agricultural land is country's main asset and instrument of production which has great development potential.

Foreign trade is one of the most important part of global economy and is practicly constantly changing and developing. It is historically oldest and still important form of external economic relationships (Plchová *et al.,* 2003). If country realised trade with foreign countries, it could afford to expend product, that is unable to produce by itself (or only with tremendous expense) and also focus on production of comodities which it deems advantegous. Foreign trade also brings this country information about comodities produced abroad and allows to compete domestic product and sercvices with foreign ones (Fialová and Plchová, 1994).

2.2. History of the Country

Moldova is fairly new state which came into existence as late as 20th century. It concurs existence of historic Moldavian kingdom which was situated on entire present Moldova territory and part of Romania and Ukraine (Gardner *et al.,* 2000).

Moldavian state was formed in first half of 14th century under influence of historic Hungary. From 16th century it was controlled by Turks. At the end of 18th century development was influencedd by tsarist Russia. (Moldavsko.net, 2012) Today's Moldova territory includes major part of Bessarabia - historic russian gubernia between river Dnestr, Prut and Black Sea (Gardner *et al.,* 2000) - which originated as a result of annexation east part of Moldova principate to Russian empire in 1812, while rest of the Moldovian land later became part of

Romania. Russian dominance lead to forcible russification of Moldova population. (Moldavsko.net, 2012)

At the end of World War I (when russian empire disintegrated) Moldovans decided to join Bessarabia back to Romania. Successor of Tsarist Russia - Soviet Union - did not want to give up Bessarabia, so it set Moldavian ASSR (Autonomous Soviet Socialistic Republic) at the opposite side of Dnestr river (where Moldovan people resorted after fleeing from Bessarabia). Fundameentally it was today's Transnistria. After this communist regime first started speaking about independent moldovian nation split by Dnestr river (Gardner *et al.*, 2000).

At the end of World War II Russia secured well known pact with Germany - "Ribbentrop-Molotov", it was secret addendum about Besarabia being under influence of Soviet union (Gardner *et al.*, 2000). As a result of this Besarabia mainly populated by moldavian Romanians was joined to Transnistria which was populated mainly by Russian population (russification takes place again). So originates 1 of 15 republics forming Soviet Union – Moldovan Soviet Socialistic Republic (Veber, 2011). Violent soviet deportation forced out almost 300 000 romanian inhabitants to Siberia and Kazakhstan.

Moldova stayed under influence of Soviet union for almost 50 years until its desintegration. In 1989 Moldovans put through return of Russian alphabet and change of both official language and state flag. 27.8.1991 Moldova gained complete independence (Film DCCZ, 2009).

2.3. Economic Background

It is known that Moldova is one of the poorest countries in Europe and despite the lack of progress is the only European country ranked among countries with low income (Low Income Country) by the World Bank (Dimitriadis, 2008). It is currently experiencing major economic problems and is an economically primitive country. Economic reform is not complete in Moldova and there is a lack of interest from foreign investors on investment (probably due to dubious investment and business environment). Moldova has very limited financial income. Was (and still is) dependent on official development assistance, which largely offsets shortfalls on the revenue side of state budget, but despite the assistance, growth rate of the economy continues to plummet (Ministry of Foreign Affairs of the Czech Republic, 2012).

Stalin pushed through the idea that there won't be built any industry facilities that could be destroyed in case of enemy attack, so all the major factories, but also the only Moldovan

power plant, are now located in Transnistria. The Soviet Union supplied all agricultural machinery and equipment to Moldova, but after the collapse of Soviet Union, regular supply ceased. Demise of state collective farms basically shattered economy. The country has become dependant on import of electricity, as well as fuel, technology and raw materials, mainly from Russia (Gardner *et al.*, 2000).

Moldova is still sensitive to the persisting ties with Russia and building new trade relations with other countries is very slow. Economic development is held back by several key factors:

- Small size of the domestic market;
- Low capital potential;
- Lack of technology;
- Partially human resources;
- Internal political conflict (Lupu, 2005).

From 1990 to 1999 (IMF, 2004), during a crisis, the sectorial structure of the economy has changed a lot. In all sectors of the economy there was a steady decline. Output in industry and agriculture decreased, by more than half. Despite that Lupu (2005) thinks that agriculture still has predominant influence in the economy. Because agriculture played (still plays) an important role in the economic activity of the country and also in the sustainability of rural development (SCERS, 2006). In 1997, agriculture sector recorded an increase by 11.4% on the output, and the first time GDP showed growth of 1.6%. In contrast to the following two years, when GDP dropped by 10%, industrial production fell by 25%, and agricultural production by 20% (IMF, 2004).

Decade before the beginning of the new millennium Moldova underwent many reforms that made non-state sector dominant. According to International Monetary Fund (2004): “In 2002 its share in GDP was 75%, with a share of over 80% in industrial manufacturing, over 95% in retail trade, almost 100% in the agrarian sector, and 54% in the sector of paid services.”

As one component of the country economy can be considered international development cooperation (assistance). According Halaxa *et al.* (2000): “Official bilateral and multilateral development assistance - foreign aid, is one of the important elements of the global system, which in less economically developed countries has contributed to economic development.” This was confirmed by a statement that the Republic of Moldova, for more than 15 years, benefits from various assistance projects, usually in the form of investment and technical projects or humanitarian assistance (PEFA and PFM, 2006).

2.4. Agricultural Markets in Moldova

Figure 1 shows the list of 23 transitive countries from eastern and central Europe (Blanchflower, 2001). Countries labeled in blue are a group of former Soviet Union states, which represented CIS group - Commonwealth of Independent States (countries). According Blanchflower (2001) countries in transition can be divided into two main groups. First group are CIS countries and the second one is CEE group - including Central and East European and Baltic State. Strategy Paper published by the International Monetary Fund (2004) says that all countries in transition, especially post-Soviet states, are facing problems associated with the previous socio-economic system, institutional uncertainty and instability of the transition period. The same source also states that all changes during the transition should have been systematic and penetrates into the foundations of the established institutional setting. Overall process of reform in transition countries is different from the others. On the example of Moldova it is possible to see that the economy was highly integrated into the economy of the USSR through the mechanism of inter-republican division of labor and economic ties with other union republics (IMF, 2004).

As Table 1 shows former Soviet Union countries vary extremely in levels of GNP per capita, population size and also in the importance of agriculture (Blanchflower, 2001), where Moldova nearly ranked first. After gaining independence Moldova had to start dealing with problems which had a political, economic and social context. Stratan and Chistruga (2012) say that there was a problem with lack of economic experience and ability to predict future economic development. Because of total collapse of the USSR economic zone, radical transformation of the Moldova economic system was essential (IMF, 2004). The change was designed to transition from a centrally planned economy towards a free market and market principles. Transformation was reflected in all areas including price liberalization, trade and foreign investment, mass privatization of the state property, introduction of the local currency in 1993 and formation of a new banking system (IMF, 2004).

Table 1: List of 23 transition countries and countries characteristic

Country Characteristic							
	GNP/ capita[d] PPP	GNP/ capita[d]	Level of Real GDP (1989=100)[e]	Populations (milions)[a]	Agriculture % GDP[a]	Inflation rate[c] (%)	Human Development Index[a,b]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country	**1997$**	**1997$**	**1997**	**1997**	**1997**	**1996**	**1999**
Slovenia	11,880	9,840	99	2	5		33
Czech Republic	10,380	5,240	98	10		9.1	36
Slovakia	7,860	3,680	95	5	5	4.4	42
Hungary	6,970	4,510	90	10	6	21.2	47
Poland	6,510	3,590	112	39		18.7	44
Estonia	5,090	3,360	73	1	7	24.6	54
Croatia	4,930	4,060	76	5			55
Belarus	4,820	2,150	71	10	14	49.4	60
Russia	4,280	2,680	58	148	8	43.8	71
Romania	4,270	1,410	82	23	20	30.3	68
Lithuania	4,140	2,260	61	4	13	26.5	62
Latvia	3,970	2,430	56	3	7	18.0	74
Bulgaria	3,870	1,170	63	8	23	121.0	63
Kazakhstan	3,530	1,350	61	16	12	38.9	76
FYR Macedonia	3,180	1,100	56	2	12		73
Armenia	2,540	560	38	4	41		87
Uzbekistan	2,529[e]	1,020	87	23	31	81.1	92
Kyrgyzstan	2,180	480	60	5	45	35.3	97
Ukradne	2,170	1,040	37	51	12	66.2	91
Albania	2,170	760	80	3	63	14.6	100
Georgia	1,980	860	32	5	32		85
Azerbaijan	1,520	510	40	8	22	20.4	103
Moldova	**1,450**	**460**	**35**	**4**	**31**		**104**
Turkmenistan	1,410	640	42	4		694.9	96
Tajikistan	1,100	330	40	6		491	108

Source: Blanchflower, 2001

[a] *Human Development Indicators, United Nations, 1999; downloadable at http://www.undp.org/hdro/indicators.html.*

b European Bank for Reconstruction and Development, Transition Report Update, April 1999.

c Transmonee 3.0 public use database at the UNICEF International Child Development Centre in Florence, Italy; downloadable from http://eurochild.gla.ac.uk/dev web/Documents/monee/Download.htm.

d World Bank World Development Indicators; downloadable from http://www.worldbank.org/ data/wdi/worldview.html.

e GDP per capita.

At the beginning of the reform of market relations, Moldova faced a deep economic recessio in which according to Lupu (2005):

- Production declined considerably;
- Unemployment and prices increased;
- Investments and exports decreased;
- Population real income in all major sectors decreased;
- Foreign public debt grew considerably (Lupu, 2005).

Due to the large level of integration of Moldovan economy into the Soviet Union economy, Moldova also had to contend with:

- Lack of domestic energy resources;
- Subsidies for the agricultural sector of the country from the Union budget;
- Equipment and components for production;
- Non-agricultural raw materials;
- Machinery (IMF, 2004).

Lupu (2005) agrees with Strategy Paper created by International Monetary Fund (2004) that the economic crisis in Moldova lasted approximately 10 years. One of the main agrarian reforms during crisis was transfer of land into private ownership and according to Strategy Paper (SCERS, 2006) currently is more than 73% of agricultural land. The same source also states that agricultural land was parceled mainly among individual enterprises delegated by small farmers and household and average area of about 1.5 ha. This change was provided without state support to agricultural producers and also without infrastructure adequate enough to sufficient financial, commercial, technological and informational consulting and other services to farmers (IMF, 2004). Due to unfamiliarity in the new market environment, lack of knowledge and changes which have occurred, country suffered from low competitiveness of domestic producers on developed country markets (Lupu, 2005).

In present time small and mid-sized farmers which were able to conform to needs of new market conditions of restructured agricultural sector have advantage. Unfortunately most of them do not have enough sufficient funds for the purchase and use of the latest technology, very limited access to information and lack of management skills (SCERS, 2006). Due to low incomes these producers are constantly on the treshold of poverty. Improving the performance of the agricultural sector, rural welfare and poverty alleviation in Moldova depends primarily

on this group of farmers. That is why companies or many non-governmental organizations exist. For example the National Agency for Rural Development (ACSA) located directly in Chisinau, the National Federation AGROinform and also National Farmers Federation which are focused on helping agricultural producers to secure access to information, education, training and also consultancy services (SCERS, 2006).

2.5. Marketing Information System (MIS)

Currently, the Marketing Information System has a long tradition. Groundbreaking period in this area was recorded in the 60th of 20th century. As the pioneers, can be regarded two businessmen who have been successful with their marketing information system in the "support of top management" (Cox and Good, 1967). It is possible to say that the Marketing Information System is a tool that can evaluate data from different areas. MIS is defined as follows: "A structured, interacting complex of persons, machines and procedures designed to generate an orderly flow of pertinent information collected from both intra- and extra-firm sources, for use as the bases for decision-making in specified responsibility areas of marketing management" (Brien and Stafford, 1968). In other words, MIS is a system of activities created for the collection, analysis and evaluating information necessary for better organization, management, planning and control of marketing activities. According to Kotler and Keller's (2007) definition MIS is: "more than a system of data collection or a set of information technologies. It is rather a continuing and interacting structure of people, equipment and procedures to gather, sort, analyze, evaluate, and distribute pertinent, timely and accurate information for use by marketing decision makers to improve their marketing planning, implementation and control."

Čichovský (2011) says that marketing research system should monitor the forecasts and trends entire period and instigate active work with marketing information. The basis of MIS information, consisting of four sources: the internal information or recording system, the marketing research system, the marketing intelligence system and marketing models or analytical marketing system (Basheer, 2010). The Figure 1 shows model of marketing information system. Both authors Kotler (1997) and Burns and Bush (2000) have almost identical models (Hess *et al*., 2004) that explains relationships between managerial tasks, uses of the MIS, MIS information development, and decisions in the marketing environment. Model presents several different components and their interactions.

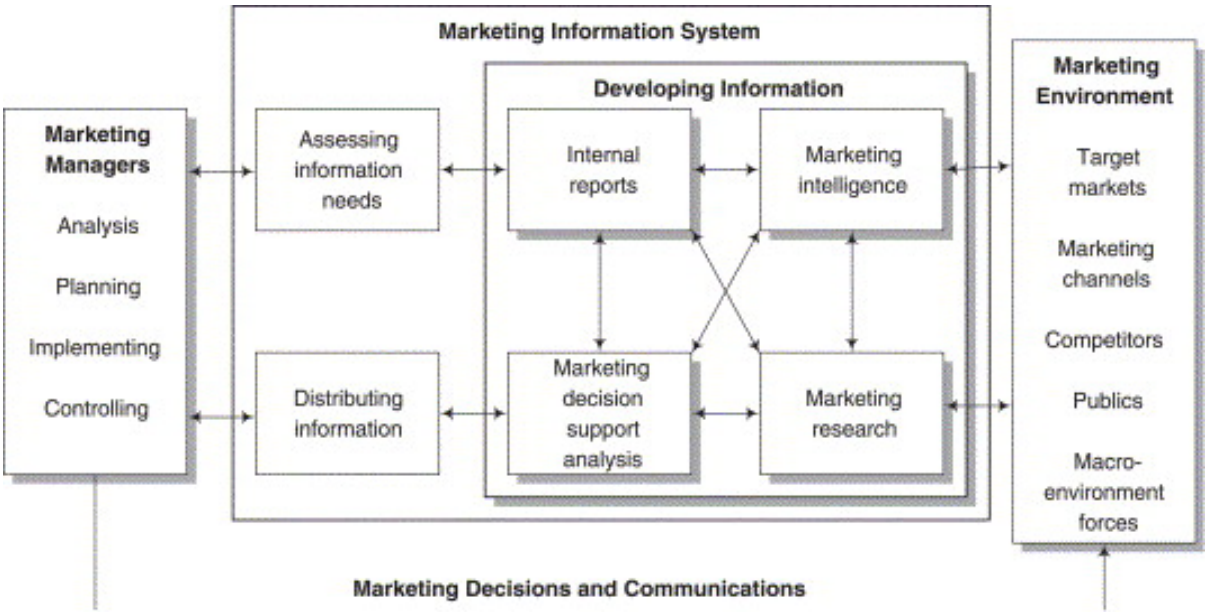
i. The internal system (internal reports) are information about results (Kotler, 1997). Basheer (2010) specify it, system includes orders received, receivables, sales invoices and also inventory records.

ii. According Basheer to (2010) the marketing research systems take the form of purposeful studies. Čichovský (2011) has a similar opinion on this issue. He says that it is the systematic identification, collection, analysis and evaluation of information related to a specific problem.

iii. On the other hand, Li (1997) and Basheer (2010) say that marketing intelligence system is less specific in its purposes. Talvinen (1994) defined it as information received from external sources which can be used for example for the proper identification of problems.

iv. Last component is analytical marketing system (in Figure 1 marketing decision support analysis). It is set of procedures and information sources to obtain the necessary information on developments in the market environment (Vokáčová, 2011). Kotler (1998) says it is system based on PC hardware and software to provide information in marketing decisions making process.

Figure 1: Structure of Marketing Information System



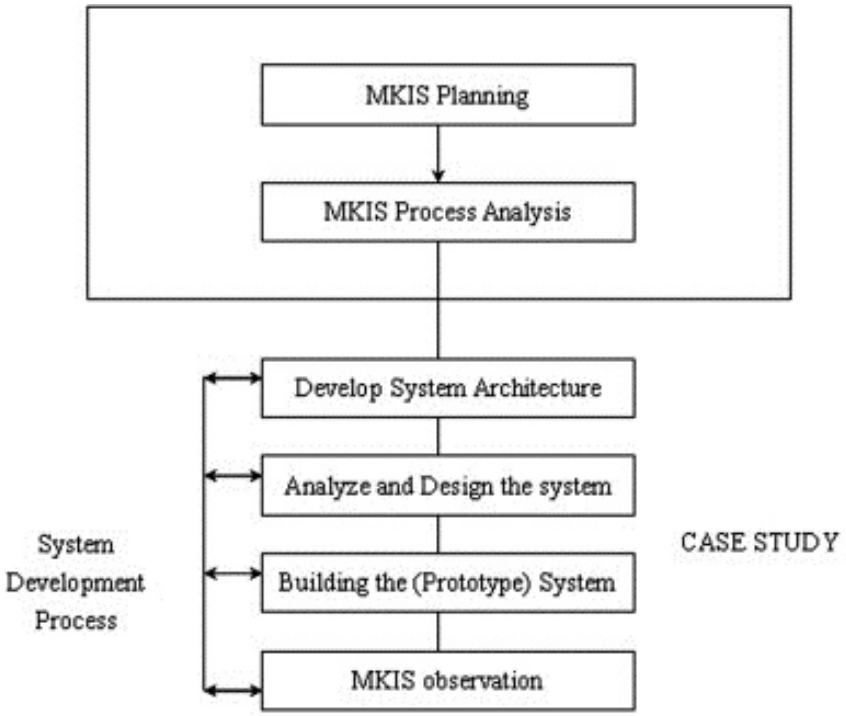
Source: Kotler, 1997, Burns and Bush, 2000

2.5.1. Utilization of Marketing Information System

MIS instigate active work with marketing information. In times of information technology, information is most valued. According to Harmon (2003), it is the advent of the Internet, and especially the browser-based World Wide Web, which has ignited a revolution in Marketing Information Systems. Utilization of good information can provide great advantage to their users. If we are looking for information, we are looking for such information, which would bring us the greatest possible benefit for the smallest expenses. Information must be readily available and relevant to the addressed issue, it also have to be timely, accurate, and the benefits of information should exceed the cost of acquisition (Jakubíková, 2008).

Figure 2 shows example of six-stage structure for development of marketing information systems. According to Lin and Hong (2009) includes: 1. Marketing Information System Planning, 2. Marketing Information System Process Analysis, 3. Develop Marketing System Architecture, 4. Analyze and Design the Marketing Information System, 5. Building the (Prototype) of Marketing Information System, 6. Marketing Information System Observation.

Figure 2: Six-stage structured development methodology



Source: Lin and Hong, 2009

1. ***Marketing Information System Planning*** is a major component of the project. Without the basic plan is not possible to build the overall structure. Planning is a step which can help clarify key areas of the project. It is essential to identify some of the key decisions which must be made by top management (Cox and Good, 1967). About the importance of top management in this regard also speak Wang *et al.* (1995): "The importance of top management's involvement in attaining high quality data has been recognized". The most essential point in the development of MIS is not a group of marketing systems. According Cox and Good (1967) the starting point is evaluation and assessment of the entire marketing organization and the policies that have control of it. It is not possible to develop a MIS unless clearly defined who is responsible for each area. Top management have to decide how to organize MIS development activities and it requires a lot of coordinated efforts of many departments and individuals, including (Cox and Good, 1967): "Marketing management, brand management, sales management, new products groups, market research personnel, control and finance departments, systems analysts and designers, operations researchers, statisticians, and model builders, programmers and computer equipment experts and suppliers (Cox and Good, 1967)."
2. ***Marketing Information System Process Analysis*** and control part of MIS contains the performance database which provides information on what the company has achieved over different dimensions (Proctor, 1991) through tools of analysis which have access to data contained in any part of the database. These processes require proper analysis and planning. Option for business process enhancements or redesign is the basis. First, is to select right set of business processes to improve or redesign, and next step is to identify areas of improvement that needed automation (Stevens, 2010).
3. ***Develop Marketing System Architecture***, according to Ngai *et al*. (2003): "Good system architecture provides a road map for the system building process. It puts the system components into perspective, defines the functionalities of the system components and delineates how they interact with one another."
4. ***Marketing Information System Analysis and Design*** is necessary for data collection on the current system. The focus is placed on establishing the requirements for the new system. In the design stage of the system, a new or alternative information system is crafted (Nunamaker *et al.*, 1990).
5. ***Marketing Information System Prototype Building*** is a process in which may arise a variety of problems that can be resolved through this procedure. According to Scott-

Morton (1984) “building a prototype system is an engineering concept”. For instance, Ngai *et al.* (2003) agree with theory that “new concepts of user interface design can be evaluated”. The prototype can be used to clarify a number of issues, learn about the notions, framework and design through the building process.

6. ***Marketing Information System Observation*** and also evaluation can begin after once a prototype system is built. The entire assessment of MIS prototype takes place through the use of case studies. It is checked whether the system works properly and fulfills all the criteria. “Researchers can capture information on what users like and dislike, and what the system does or does not do to meet those users need” (Ngai *et al.*, 2003). Its influence can be seen through detailed case studies.

2.6. Agricultural Marketing Information System (AMIS)

Agricultural Marketing Information System is specifically designed to aid in the agricultural sector. There are many versions according to the specific focus (animal production, plant production and their concrete areas). Given the fact that AMIS is already a specific type of marketing information system it should be designed to fit the needs of users and facilitating their search for needed information. Agriculture MIS is designed to help decision makers and to provide marketing insights (Kotler, 1997). On the other hand AMIS can be based directly on the marketing information purpose or organization managing it. According to study conducted in South Asia by Binayee (2005), MIS can be generally classified as follows:

i. MIS supported by development projects; MIS systems which are created under the auspices of the development projects are targeted mainly on support of small local communities and business owners. Information used in the database can also come from resources of other development agencies, government organizations and development projects (Binayee, 2005). Basic assumption is the user participation in its development. This is the reason why these marketing information systems are made directly for specific users from the beginning.

ii. MIS of agri-enterprises; The most frequent users of these systems are internal clients of organization, or rather the company clients. Essence of MIS is to support marketing efforts and marketing decisions of the company and its network (Binayee, 2005). In some cases, by mutual consent, business partners of the company can benefit from MIS.

iii. MIS services of member based organizations and business service providers; Trade organizations or cooperatives groups provide marketing information services (Binayee, 2005). Community members are partly involved in the financing of these services, but as a source of finance are also used development projects. This type of marketing information systems are usually developed on the extent of their users, who can pay for the provided information and services.

iv. MIS managed by government; The main aim is to generate information for policy making, developing agriculture support programs, and facilitating the effective delivery of government technical and legal services to development organizations, farmers, and business communities (Binayee, 2005).

Definitely can not say which of the described agricultural marketing system is the best and most effective. It much depends on the area in which the MIS is implemented. Government programs and non-governmental organizations (NGOs) help in the development of information technology and services. In this regard, developing projects can start easier MIS. There might be a problem with providing information to distant villages and areas where there is not yet the latest technology. It is a very demanding, both for time and financially, and it is also inefficient. Binayee (2005) believes that MIS has a potential contribution to the development of this sector, and thereby to support dependent communities. Private and smaller companies generally have lack of the resources therefore are not able to provide the following information for the benefit of local communities, small businesses and farmers. In this case it seems to be a government project the right solution, can be the only solution. But in the long term period, the project support should be focused on sustainable technology after project completion.

2.6.1. Utilization of Agricultural Marketing Information System

Nowadays information systems in agriculture are desirable due to direct connection to rural development and thus also the elimination of poverty. There is a direct link with efforts to fulfill Millennium Development Goals (UN, 2004). According to Singh (2006) new information and communication technologies can play an important role in rural development by empowering farmer’s knowledge and skills. It serves as a comprehensive tool for completing data and information dissemination among stakeholders, especially in poorer areas.

There is a close connection between marketing information and consulting services. People who use Agricultural Marketing Information System, sooner or later, will be interested in information itself, but also in consulting services. User-effective AMIS should contain data from different areas of agriculture such as: information about market prices, quality seeds, information about crops cultivation, fertilizers (ACSA, 2006), information about new technologies, but also about the possibilities of expansion of expertise in this area, trainings, improved access to inputs, credit or savings promotion scheme.

Marketing nformation systems in the time of the Internet revolution are used increasingly more. Some are charged for, some are not. In rural areas, it is mainly about exploitation of agricultural marketing information systems that support the development, the question is whether users should pay for the information or not. The main AMIS's objective can be poverty reduction in rural areas and to promote sustainable development. According to a study from sub-Saharan Africa (Tollens, 2006), not all people have the ability to pay for the information provided from AMIS or other consultation services. In some cases, payment is made rather as commodity exchange. This is the reason why it is difficult to keep running these marketing information systems. Shepherd (1997) advocates assertion that market information used by farmers may be considered as public goods. Especially in places where are small farmers who are unable to pay for the information.

Agricultural Marketing Information Systems that currently exist in developing countries are financed mainly from internal budgets of countries and subsidies, sometimes they are partially financed by users who pay for using information such as for example in India (Singh, 2012), but there are also donors, such as local organization or NGOs for rural development which are usually cooperate with ministries (Ministry of Agriculture). Among the donors who contribute to the development and maintenance of AMIS are for instance: United States Agency for International Development (USAID), Food and agricultural Organization (FAO), World Bank (WB) and also the Asian Development Bank (ADB) (Akerman, 2011).

2.7. Agricultural Marketing Information System Development and Establishment in the Republic of Moldova

Agricultural Marketing Information System was created as a part of the Czech Republic Development Cooperation Project in 2006-2009 ("Support to Rural Development - Increasing Qualifications of Management and Advisory Capacities") by Institute of Tropics and Subtropics, covered by Czech University of Life Sciences, Prague. Project was implemented

with close cooperation with partnership organization situated in Moldova called National Agency for Rural Development (ACSA) in Chisinau.

AMIS was designed as a system of modules with many interactions cooperating also with external terminals. It is directly intended to gather information from various sources and storing data in its database and process data for users. Basic idea was to create a simple and reliable information system that will be accessible to the general public anywhere in Moldova with the development possibilities in the future. The original proposal was to create two separate systems, “Information system for agricultural and food products” (Figure 5) and “Information system of agricultural and food producers” (Figure 6), but had to be changed (CULS, 2009). Change was made on request associated with creating a functional operator in the field of agricultural marketing information services. Creation of program for database of agricultural and food products and producers was essential requirement for creation of database itself (CULS, 2009). Complete agricultural marketing information system (Figure 7) was connected online and is available at official AMIS web site under the National Agency for Rural Development (ACSA) web sites.

ACSA is the executive unit that implements 3 components of the Rural Investments and Services Project, financed by the Government of Moldova and World Bank (ACSA, 2012), (NGO was appointed as the main AMIS administrator for operations and management):

i. Rural Extension Services; ACSA manages a network of 35 service providers (Figure 3 shows regional advisory center), that means 350 local advisory center employing approximately 425 consultants, out of which 75 regional and 350 local consultants. The local advisory offices are located within the premises of mayor offices which represents the local public authoritie’s contribution to the development of extension service in the Republic of Moldova (SCERS, 2006).
ii. Land Re-parceling in 40 villages; ACSA works with 4 of its regional advisory centres created within the first component. 40 consultants in the field of land planning located at level of rural community (ACSA, 2012).
iii. Drought Adaptation Advisory Services; ACSA works with a network of rural advisors (ACSA, 2012).
iv. Addition to the aforementioned workers, ACSA also cooperates with more than 200 experts from various institutions and private companies for the purpose of conducting specific tasks within the project (ACSA, 2012).

Figure 3: ACSA regional and local advisory centres

Source: ACSA, 2013

2.7.1. Structure and use of the Agricultural Marketing Information System (AMIS) in the Republic of Moldova

i. At the beginning of MIS ddatabase overall structure creation is the need to set specific goals, what must the database contain and what criteria they must satisfy and how should it be divided (Salant and Dillman, 1994). Producers, suppliers, products and services are classified according to various parameters. These allow of the producers concerned, traders and mediators quickly find the desired information and use it proper way (Havrland *et al.*, 2010). As Table 2 shows complete concept of the structure of AMIS database which is divided into 9 main groups, each of them has subgroups that contain individual products and services. Among the main groups belongs seeds and seedlings, animals, agricultural producers, plant and animal health, agricultural equipment, processing and acquisition companies, packages and others, research and certification institutes. According to Giovannucci and Shepard (2001) marketing information systems should also provide information such as quantities traded, quantities available, etc., which in their view leading to greater utility of MIS.

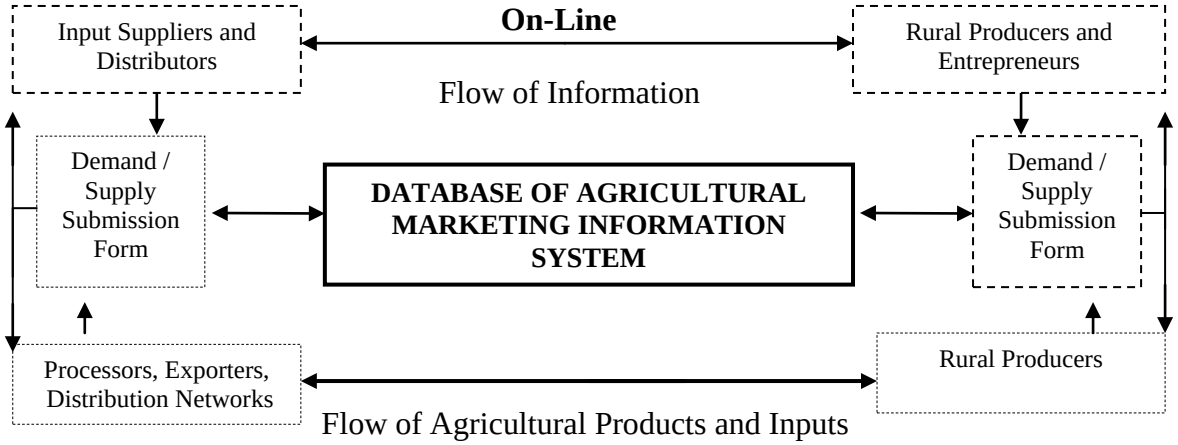
Table 2: The complete conception of AMIS database structure

	Number of groups of products and services	Subgroups	Products/services
01	SEEDS AND SEEDLINGS	11 subgroups	100 products
02	ANIMALS	15 subgroups	100 species, races and specifications
03	AGRICULTURAL PRODUCERS	8 subgroups	93 products
04	PLANT HEALTH	8 subgroups	27 products
05	ANIMAL HEALTH	4 subgroups	23 products and services
06	AGRICULTURAL EQUIPMENT	11 subgroups	22 equipment and services
07	PROCESSING AND ACQUISITION COMPANIES	2 subgroups	24 services
08	PACKAGES AND OTHERS	7 subgroups	various products and services
09	RESEARCH AND CERTIFICATION INSTITUTES	4 subgroups	various services
	MARKET RESEARCH MODULE		

Source: Kandakov, 2012

ii. Marketing Information Systems are not widespread in public sector, that affirms survey of 120 developing countries by FAO which identified only 53 such systems (Shepherd, 1997). According to Varangis and Schreiber (2001) most of them usually have low functionality. But due to the establishment of this system, Moldovan producers and rural businessmen have good access to relevant information and also to consultancy services. Binayee (2005) says that use of MIS can have more advantages also for traders and entrepreneurs who use it for improving their business processes, finding alternative markets and buyers, and improving negotiations at the market places. Figure 6 shows flow of agricultural products and inputs and according Chow (1999) "workflow is a network of activities, also commonly known as a business process, defined for a specific business objective". Concretly Figure 4 shows general database and on-line information flow which can provide useful data about inputs between rural producers and entrepreneurs, processors, exports, distribution networks, input suppliers and agricultural products.

Figure 4: Basic framework and share of information sources through the AMIS



Source: Kandakov, 2012

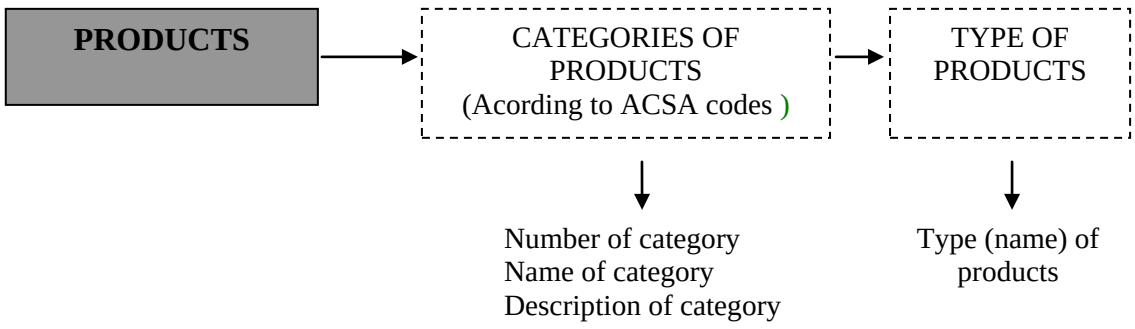
Andreoni (2001) says that "technology transfer has been one of the main drivers of agrarian change". This system ensures logistical support in terms of information and localization of agricultural inputs and services to producers and rural entrepreneurs in following areas: ensuring agricultural inputs (like seeds, fertilizers, agricultural machines and equipment), marketing agricultural products and services offered by rural producers (Tollens, 2006), virtual market of agricultural products destined for

distribution networks and processing industry, searching and identification of partners to implement joint investment projects in rural area.

iii. AMIS database has two main parts. First is a Database of agricultural products (Figure 5) and the second is a Database of agricultural and food producers (Figure 6). Theses databases are connected into one information system called AMIS (Figure 7).

The main sources of data on agricultural and food products, as well as their properties and potential for the domestic market but also export from which AMIS database was formed are mainly Moldovan Ministry of Agriculture and non-governmental organization ACSA. As well as the agency ACSA, agencies in South Asia - National News Service (NNS) and Indian and Agribusiness Systems Private Limited (popularly known Agriwatch), concretly in India collect information from their own sources and others (Binayee, 2005). This section is responsible for the monitoring and mapping of agricultural and food products, their properties and potential of the domestic market and for export. For the simplification the products were categorized by product's name, location, production volume, product prices, production conditions, manufacture, export potential and logistic parameter and also according to ACSA codes.

Figure 5: Information system for agricultural and food products - The structure of database of agricultural and food products as a separate system

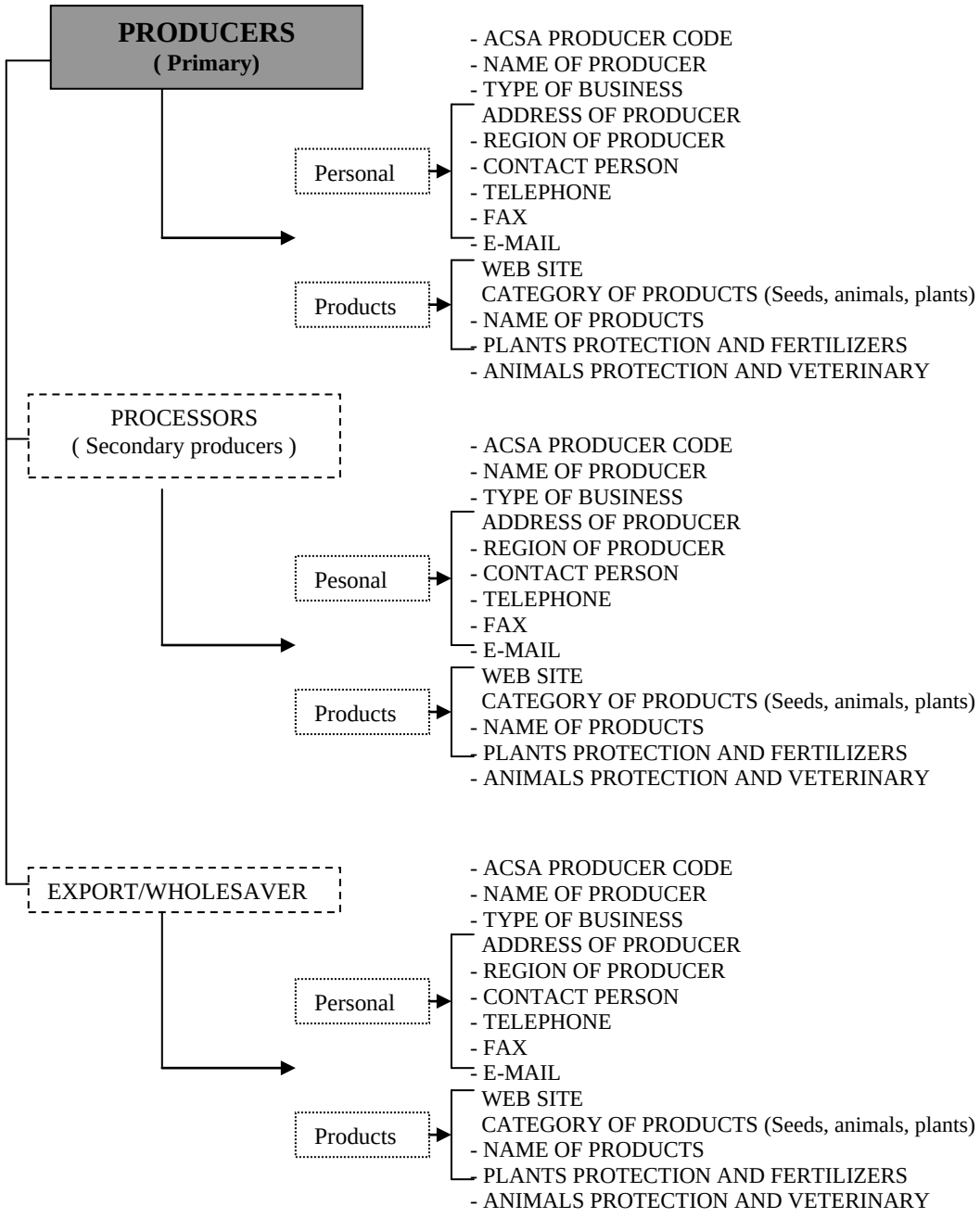


Source: Kandakov, 2012

As in the first database also in the database of agricultural and food producers were used information acquiered from Moldovan Ministry of Agriculture, non-governmental organization ACSA and also from Food Industry of Moldova. This part of the AMIS system includes basic information about producers with the inclusion of their mapping, potential placing on the market abroad and for their future pro-export

orientation and also properties of their processing portfolio. As Figure 6 shows, producers were also classified according to their personal information (ACSA producer code, name of producer, type of business, address of producer, region of producer, contact person, telephone, fax, e-mail or web site) but mainly by concrete products (category of products - seeds, animals, plants, name of products, plants protection and fertilizers, animals protection and veterinary, equipment).

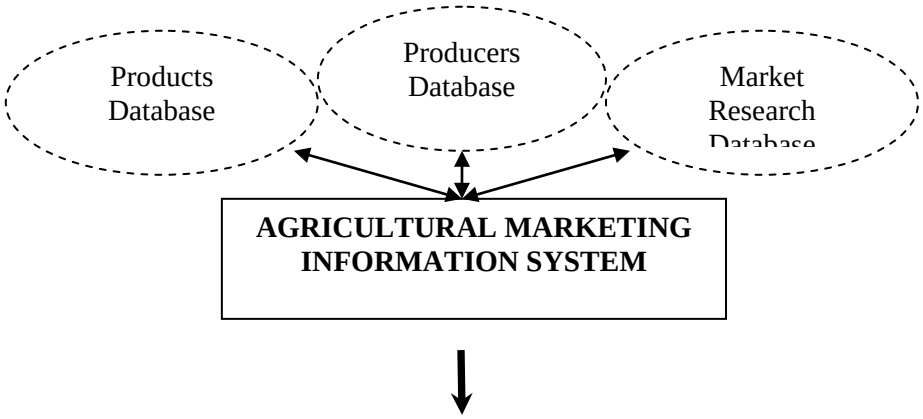
Figure 6: Information system of agricultural and food producers - The structure of database of agricultural and food producers as a separate system



Source: Kandakov, 2012

Simple structure of the system allows relatively quick access to the searched information for each user of the system. Answers to basic questions such as: *what* you need - *product, where* you get it - the *market*, *how much* will it cost - *price* and *how* do you get it - *promotion*. According to Seko (2009) as cited by Anteneh (2008), services to the agricultural sector include: agricultural research, agricultural extension and information services, education and training, rural financing and insurance marketing of agricultural products and market promotion, input delivery services for plant production and animal production, regulatory services often provided by governments, technical support services and activities related to the provision of the technical and social infrastructure for agriculture. Thanks to the interconnection of individual database of products and producers users have access to a continuous flow of information. Ngai *et al.* (2003) say that Information Systems allows consistent handling of work and efficient handling paperwork.

Figure 7: Agricultural Marketing Information System online information flow



Source: Kandakov, 2012

iv. In Moldova, AMIS is designed for a wide range of users. Rural entrepreneurs and farmers represented the target group of AMIS users. Together with AMIS ACSA provide also technical assistance in form of Rural Extension Services. Main groups of users are: “agricultural producers and rural entrepreneurs, small and mid-sized farmers, professional associations of agro-producers, producers and distributors of agricultural inputs, traders, service providers and distributors from agro-food and other related sectors, agro-food enterprises (processors, acquisition companies and

distribution networks, NGOs in the field of agricultural sector development, international development projects and agencies, international and national companies, natural persons and legal entities), rural extension network, Ministry of Agriculture and Food Industry of the Republic of Moldova and its subordinated departments, institutions and subdivisions, districts councils and their subordinated departments, local councils" (Kandakov, 2012) also there is a possibility that eventual users can be ACSA clients. Despite the AMIS main stakeholders, for example MIS in Sub-Saharan Africa is focused more on the weakest who are smallholder farmers, although the aim is to involve all market participants (Tollens, 2006).

v. AMIS data are dissiminated through internal modules. This allows to monitor the situation in the agricultural sector in individual regions of Moldova and create reports that provide information about commodities and identify problems. Information system Web site includes four modules:

    1. Supply module is mainly used to publish information and share it with other users. Any user can publish his supply online.
    2. Demand module offers the possibility to systematically share information sources on demand. Any user can publish his demand online.
    3. Search module is designed to search a variety of information according to the region, producer, product, or directly by ACSA product code.
    4. Market Research module can be used for market research purposes regarding individual products, individual producers, but also entire regions or ACSA product code. It also produces data on market trends and dynamics of minimum and maximum prices of agricultural commodities in Moldova.

Provision and dissemination of data to the AMIS user is mainly realized online. But there are also other possible solutions how to get specific information. According to Seko (2009) services to the agricultural sector include also agricultural extension and information services. Therefore there exist a posssibility to get information as well through the local ACSA consultants in specific regions. These consultants provide information that is commonly available online in AMIS. They help to ensure access to information for individual agricultural operators and farmers who do not have access to the internet, therefore the necessary information. Consultants encourage and promote the transmission of information, technologies and innovation to rural areas.

3. OBJECTIVES

3.1. Main Objective

The main objective of the thesis is to assess the impact of the Agricultural Marketing Information System (AMIS) on the position of small and mid-sized agricultural businesses on local agricultural markets in three concrete regions of Moldova (Anenii Noi district, Telenesti district and Singerei district). To evaluate the effectiveness of AMIS operations in selected villages and determine the extent of available information used by local farmers with an assessment of its impact on their lives.

3.1.1. Specific Objectives

Specific objectives are composed of several points:

- Firstly, to compare the data obtained from selected villages of each district in following key areas: personal data, agricultural production, production volume output, market trends, supply and demand, competitiveness, and the usage of the information system.

- Secondly, to identify possible shortcomings of AMIS and to determine what kind of deficiencies are there specifically presented.

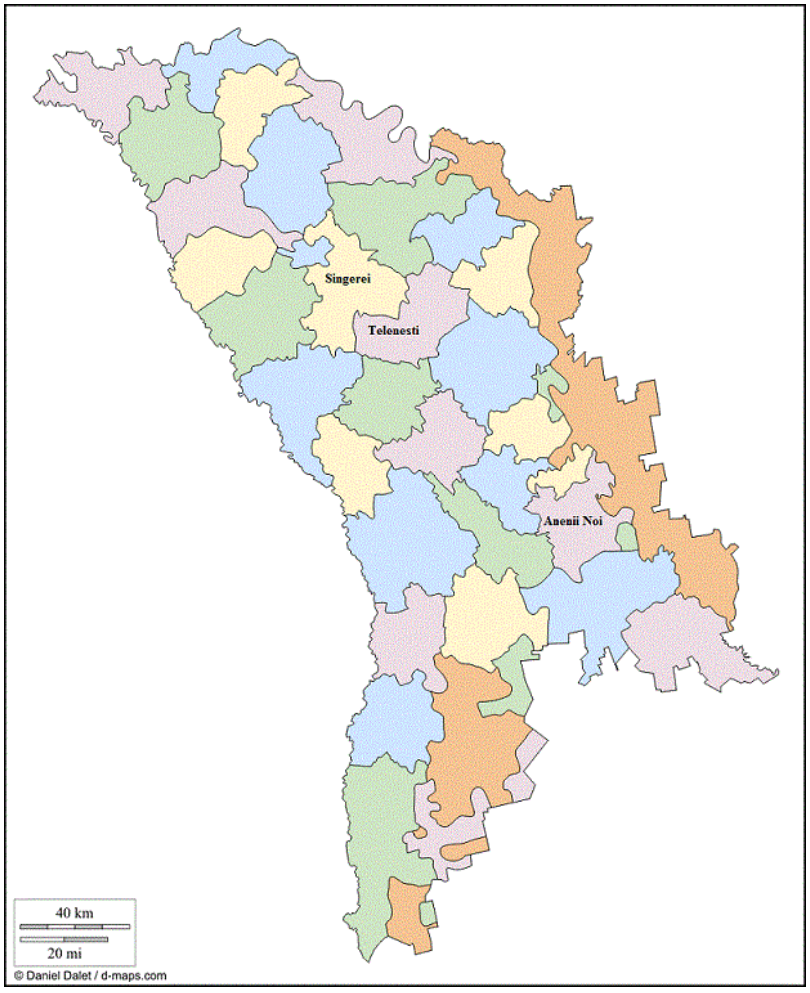
4. METHODOLOGY

Methodology is divided in two main parts. Secondary data collection helps to better understanding of topic and serves to indicate the topic, followed by primary data collection which representing new data.

4.1. Description of Study Areas

This study is focused on three specific districts: Anenii Noi district, Telenesti district and Singerei district. Each of them is located in a different part of Moldova. For the purpose of the survey are selected four villages: Puhaceni and Delacau from Anenii Noi district, Cazanesti from Telenesti district and Dobrogea Veche from Singerei district.

Figure 8: Position of Anenii Noi district, Telenesti district and Singerei district in Moldova



Source: Dalet, 2013 (modified by researcher)

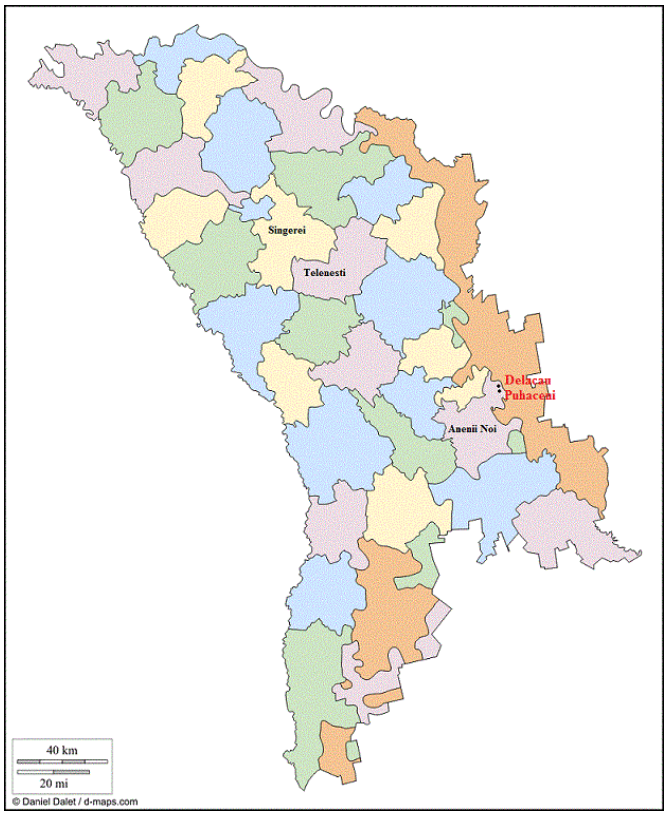
4.1.1. Anenii Noi District

Anenii Noi district is located in the central part of Moldova, to the south-east of the capital city. It is a slightly hilly landscape with fertile soil. District has 1 town, 19 villages and 25 communes. Total population at January 2013 is 88 694 persons (State Register of Population MD, 2013). The vast majority of them 84% are Romanian origin (National Bureau of Statistic MD, 2011).

Survey was applied in two villages in this district:

- ***Puhaceni*** is a village with almost 4 000 inhabitants, current number at January 2013 is 3 881 inhabitants (State Register of Population MD, 2013). Village is situated along the Dniester River, and is divided into 4 smaller areas. More than 60% of the land is agriculturally managed. Farmers are devoted mostly growing vegetables, fruits and oil crops.
- ***Delacau*** is a neighbour village of Puhaceni. It is smaller village with almost half the population of Puhaceni. Latest number is 2240 inhabitants (National Bureau of Statistic MD, 2011). As in Puhaceni, farmers focuse primarily on growing vegetables and fruits.

Figure 9: Map of Puhaceni and Delacau village location



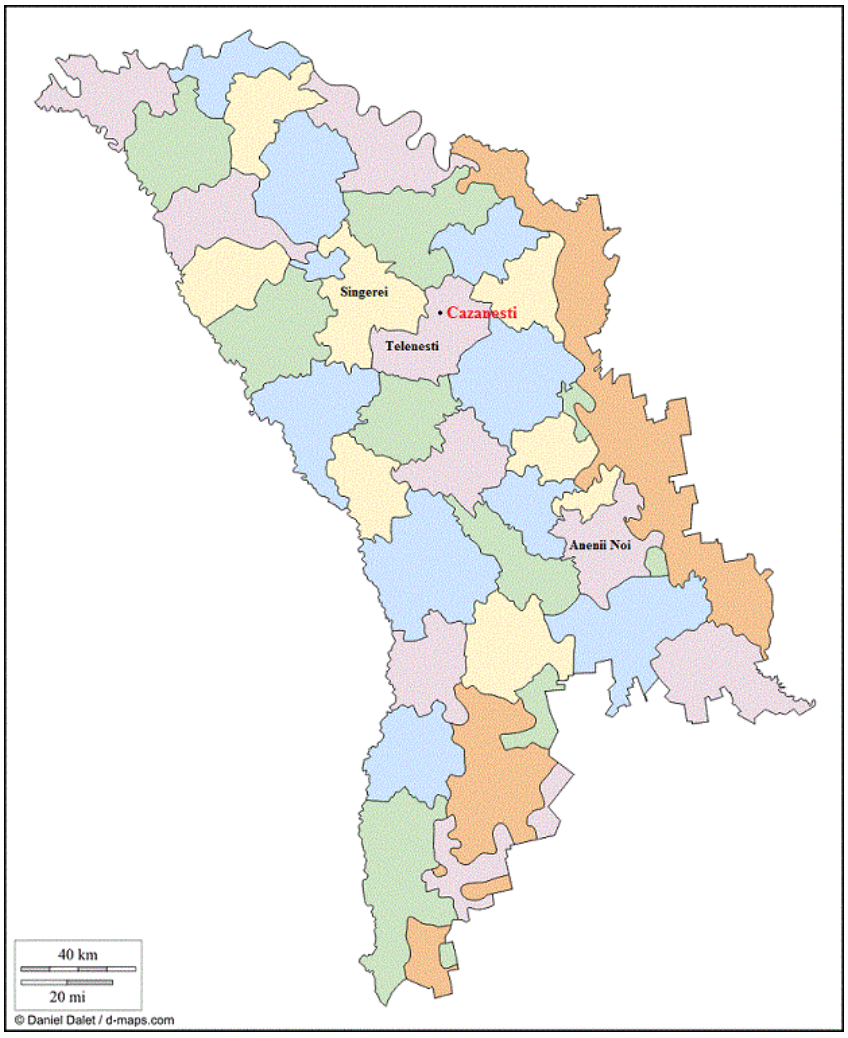
Source: Dalet, 2013 (modified by researcher)

4.1.2. Telenesti District

Telenesti district is located on the edge of central part and partially belongs in the northern part of Moldova. This is the territory where the fertile lowlands are interspersed with wooded slopes. There are reserves of limestone, rough stone and building sand. District has 1 town, 23 villages and 30 communes (Consiliul raional Telenesti, 2011). Total population is 70 126 persons (National Bureau of Statistic MD, 2011). The vast majority of them 98% are Romanian origin (Consiliul raional Telenesti, 2011).

- Survey was applied in ***Cazanesti*** village, situated in the northwest of the district. It is a village with 1 945 inhabitants (National Bureau of Statistic MD, 2011). Among the major cultivated crops belong corn, sunflower, but also vegetables and fruits.

Figure 10: Map of Cazanesti village location



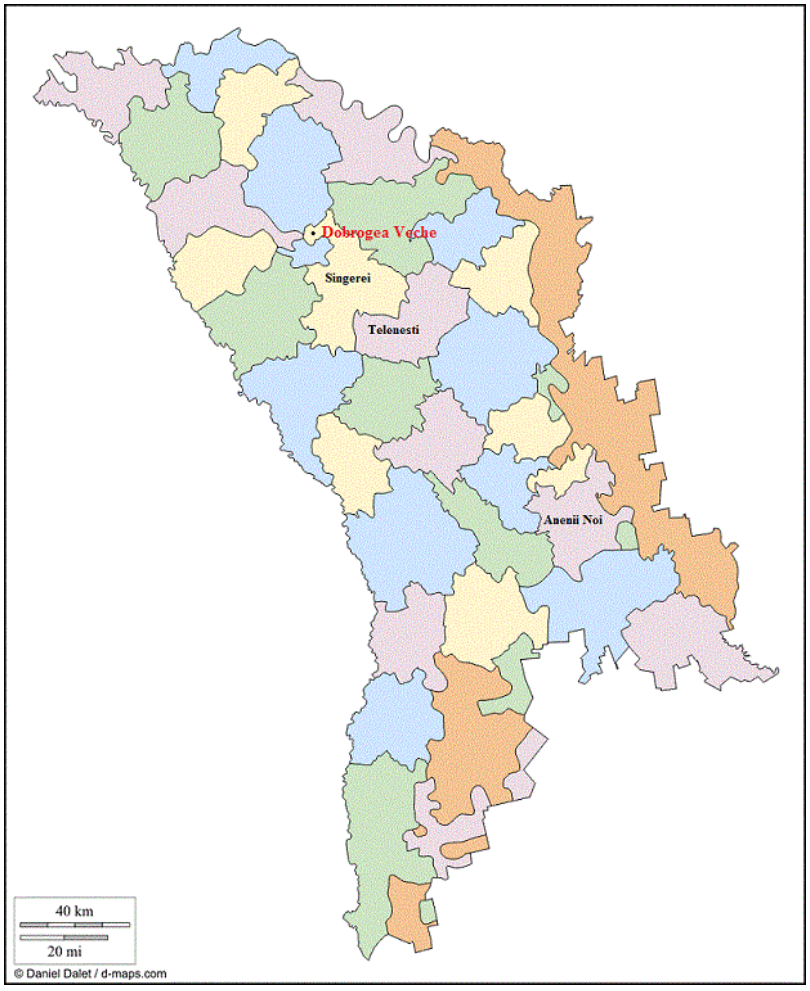
Source: Dalet, 2013 (modified by researcher)

4.1.3. Singerei District

Singerei district is located in the north of Moldova. It is mostly steppe land with clays and sands changing into hilly terrain with a maximum altitude of 240 meters above sea level. District has 2 towns, 68 villages that are divided administratively into 26 municipalities. Total population in 2010 is 87 152 persons (Consiliul raional Sîngerei, 2010). The vast majority of inhabitants 86% are Romanian (Moldavian) origin (Consiliul raional Sîngerei, 2010).

- Survey was applied in ***Dobrogea Veche*** village. The small village located in the north of the Singerei district, 131 km from Chisinau. Aaccording to the population census in 2004, 1 181 inhabitants live in the village (Casata.md, 2013). Dobrogea Veche is mainly known for the cultivation of ornamental flowers, particularly roses. Among other cultivated crops include fruits and vegetables.

Figure 11: Map of Dobrogea Veche village location



Source: Dalet, 2013 (modified by researcher)

4.2. Timeframe for the Thesis Preparation and Data Collection

During November 2011, the topic of the thesis was selected and approved. During the following months, approximately till May 2012, questionnaires were developed. The final version of the questionnaire structure was done before leaving to Moldova, where data collection was conducted in the period from June to July 2012. Prior to departure began information collecting which was required to write a literature review. The actual data collection in Moldavia took one month. After author has returned to the Czech Republic, the process of literature review preparation and data processing has been started.

4.3. Description of the Target Groups of Farmers

As a target group small and medium-sized farmers in rural areas in Moldova were selected. The selection of respondents was not influenced by age or gender. In this regard the selection can be considered as a random. The condition for the respondents was to have a relationship to agriculture (be a farmer, living on a farm, working on a farm or in agriculture, conection with ACSA consultants etc.).

Overall, 87 questionnaires were collected and all were deemed adequate to utilize in the assessment. The data collection was therefore deemed to be complete. Even though, the original assumption was 100 questionnaires. 75% of the total respondents are women (65 subjects) and 25% are men (22 subjects).

4.4. Data and Data Sources

Primary and secondary data were collected during the diploma thesis elaboration and preparation.

4.4.1. Secondary Data Collection

In the first phase of the assessment, an exhaustive analysis of published data (scientific papers and abstracts, statistical databases, official documents, governmental reports) and materials utilized for the implementation and maintenance of the AMIS system was conducted. Subsequently, an AMIS user group was targeted in the aforementioned regions: Anenii Noi district, Telenesti district and Singerei district, from which key information was obtained.

For the purpose of the survey target group was selected, composed of small and mid-sized farmers who own agricultural parcels in four specific villages: Puhacenni, Delacau, Dobrogea Veche and Cazanesti.

4.4.2. Primary Data Collection

Preliminary data were obtained only as a test sample of 10 respondents during the final preparation of questionnaires before leaving Moldova. The reason for this test was to eliminate errors and to verify that the questionnaires are comprehensible for respondents. For the purposes of this test sample 10 individuals was selected who corresponded to the target group of respondents in Moldova.

In the second phase of the assessment, data collection using questionnaires combined with observation and formal (face-to-face) interviews in the field were conducted. Questionnaires were distributed among the respondents personally. In the case of the Romanian language speaking respondents, sometimes the local translator was used.
Survey was based on semi-structured questionnaires involving both types of questions (open-ended, close-ended). The total number of questions was 22. The questionnaire was aimed at collecting data in the following key areas: personal data (6 questions), agricultural production (3 questions), production volume output (2 questions), market trends, supply and demand (2 questions), competitiveness (2 questions), and the usage of the information system (7 questions).

4.5. Data Analysis

Various types of analytical methods can be applied to evaluate different results of research and a proper closing of the survey information. Literature shows, that any required analytical method has its advantages and limitations it is always suitable to choose the one that better suit response to a specific purpose (Pallant, 2010, Hopkins *et al.*, 1996).

In the third phase of the assessment were used basic descriptive statistical tools which were directly used to summarize the research data, such as arithmetic mean (Mean value), weighted average, modus, median, absolute and relative frequency and percentage. These descriptive statistical tools were used to evaluate the data obtained from respondents mainly in the field

of personal data, agricultural production, market trends and the usage of the information system.

i. Arithmetic mean (Mean value) is the average of all values in the statistical file. Average is calculated by adding up all the values and divide by the number of values in the file (Bohm, Zech, 2010).
ii. Weighted average generalizes the arithmetic mean and provides a statistical characteristic of the file in the event that the values in this set have different importance, different weights (Bohm and Zech, 2010).
iii. Modus random variable is a value that is within the statistical file occurs most often. It is a character value with the the highest relative frequency (Souček, 2006, Svatošová and Kába, 2012).
iv. Median is the value that divides a range of diameters arranged results in two equally large halves. The rule is that at least 50% of the value is less than or equal to the median and minimum of 50% is greater than or equal to the median (Souček, 2006, Svatošová and Kába, 2012).
v. Frequency, absolute or relative indicates how many values of a given character is found in the statistical file, either absolutely or relative to the total number of elements in the file (Souček, 2006, Svatošová and Kába, 2012).
    - Absolute frequency value of a statistical character indicates the number of occurrences of a character in the statistical file.
    - Relative frequency shows the percentage values of the statistical character of the file which is equal to the value of character.

The other used statistical tool was analysis of variance ANOVA (ANalysis Of VAriance). ANOVA was processed in programme named Math software R. R is specialized mathematical software for statistics. Five hypotheses concerning production process and yields of farmers and what influence using agricultural information system has on production and yield in three particular districts in Moldova (Anenii Noi, Telenesti and Singerei) were determined.

i. Analysis of variance tests the difference between the averages of several groups that have been subjected to the various experimental interventions, representing the level of acting factor whose effect is monitored. Null hypohothesis are tested using the F test to compare two variances.

4.6. Limitation of the Research (Study)

Despite all efforts to achieve the best results, there are some limitations that may affect course of the research and also the subsequent processing of the results.

i. The most common restriction during face-to-face interviews is the language barrier that may cause misunderstanding between both parties. Therefore, it is sometimes good to have the option to use a translator. During the data collection, translator was used in cases where respondents spoke mainly Romanian language.

ii. Another limiting factor of the research can be considered poor infrastructure of the country, in case when it is neccesary to travel more or to larger distances.

iii. The cultural differences between local people and foreigners could be a major problem. Especially during the face-to-face interviews one must raise the respondent's trust. Often personal data there are also gathered, and if the respondent does not have confidence in you, information that are required will not be obtained.

iv. Current socio-political situation in the country may be also problem.

v. In this case, research was partly influenced by the time of harvest. Farmers were busy and did not have much time to complete a questionnaire. Therefore, the total number of completed questionnaires is smaller than was expected number.

5. RESULTS AND DISCUSSION

This part of the thesis presents the main findings of the study and its distribution into three parts. First part includes summary of basic information (number of completed questionnaires in individual districts and villages, personal data about respondents: sex, distribution of age, nationality, profession etc.). The second part presents the results concerning the production of farmers (land size, the main crops etc.). The third part focuses on results primarily concerning to AMIS (awareness of AMIS, the use of AMIS, the most commonly used information, sources of used information, AMIS effect on farmers etc.).

5.1. Summary of Basic Information

87 questionnaires were filled out during field research in three selected districts (Aneniii Noi, Telenesti, Singerei) in four particular villages (Puhaceni, Delacau, Cazanesti, Dobrogea Veche). Out of 87 respondents 65 were women and 22 were men.

As table 3 shows most respondents answered in Telnesti district 35%, by contrast in Anenii Noi district, where research was carried out in two villages only 32% responded and out of that 26% from larger village Puhaceni and 6% from village Delacau. Low count of questionnaires from this district but mainly from Delacau was influenced by the amount of time available for data gathering. Harvest time arrived during research in these two locations. Local farmers had little time. Because of this it was not possible to fill out more questionnaires.

Table 3: Total number of respondets in districts and villages

Distrikt	Number of respondents	%	Village	Number of respondents	%
Anenii Noi	28	32	**Puhaceni**	23	26
			Delacau	5	6
Telenesti	30	35	**Cazanesti**	30	35
Singerei	29	33	**Dobrogea Veche**	29	33

Source: Prepared by the researcher according to collected data

Less than fifth of respondents are younger than 35. Most of respondents, as shown in Appendix Graph 1, were 46 to 55 years old. Age of respondents was not considered as criteria when selecting target group but partly points out uneven age layout of moldova's population. Due to high unemployment rate younger individuals travel abroad to gain employment.

As Appendix Graph 2 shows Anenii Noi district (village Puhaceni and Delacau) residents are originally moldovans unlike Singerei district (village Dobrogea Vechce) residents where mostly people with russian origins live. In all researched districts ukrainian nationality residents were detected.

Appendix Table 1 shows division of respondents according to profession. Even though less than 50% of respondents work in agriculture or in branches that are directly related to agricultural sector, 87% of respondents have their own land which is intended for agricultural production. Remaining 13% do not own any land, 10% work on other people's land. Among most common professions in three researched districts were especially Teacher/Help Teacher, Houskeeper/Nanny, Physician/Nurse/Technician or Accountant yet 97% respondents (owning land or working on someone else's land) confirm that apart from their profession they also work as farmers and yielded crop intended to be sold serve as means of support.

5.2. Summary of Agricultural Production

As was said before, agriculture serves as one of sources of living. 87% of respondents own their own land intended for agricultural production. In terms of questionnaire research it was ascertained how much land do individuals own (amount was most frequently determined in hectars in local measure called “sotka”). As Table 4 shows most frequent value is < 0.49 ha. Absolute frequency tells us that from total of 87 respondents 22 answers is with same result. This value corresponds to relative frequency 25.3%. The reason why most farmer's own agricultural land up to 0.49 ha it could be already mentioned poverty, but also the fact that most respondents profession is not a farmer, but very often they are working in other fields. Appendix Table 2 shows complete division of individual absolute frequencies for individual villages as opposed to Appendix Graph 3 which shows size of the individual agricultural units owned by respondents divided by individual villages.

Appendix Table 3 shows overview of most frequently grown crops divided by individual villages and their absolute and relative frequency. Most frequently grown crop out of all four villages is corn which is grown by more than half of respondents (54%).

Table 4: Overview of sizes of agricultural land by respoondents, absolute frequences and relative frequences

Numer of respondents[f]	Land size in hectars	Absolute frequency	Relative frequency in %
1-22	< 0.49	22	25.3
23-34	0.5 - 0.6	12	13.8
35-42	0.61 - 0.7	8	9.2
43-45	0.8 - 0.9	3	3.4
46-57	1.0 - 1.5	12	13.8
58-66	1.6 - 2.0	9	10.3
67-73	2.1 - 4.0	7	8.0
74-75	4.1 - 6.0	2	2.3
76-81	> 6.1	6	6.9
82-87	Unknown	6	6.9

Source: Prepared by the researcher according to collected data

Among other crops grown in each village belong sunflower, potatoes, tomatoes, peper and eggplant. According to Kandakov and Havrland (2011) the vegetable production is one of the few profitable agricultural sectors based on cash crop cultivation and marketing. Bearing in mind that Moldova is not hilly country, neither soil kinds does not differ much between individual districts. Questionnaire research showed that except one, in all villages were grown the same or very similar crops. In Dobrogea Veche village respondents stated, except most frequently grown corn, also flowers (especially roses), raspberries and beans. This nuance is given mainly by the village's location (most northern village out of all four) in place where soil somposition is suitable for growing such crops.

Cultivated production is partly consumed by farmers themselves and rest is intended to be sold at the local markets or eventually exported to the neighbouring countries (among most frequently exported crops according FAOSTAT statistics in 2010 belong Wine, Walnuts Shelled and Sunflower seed). For farmers and their trade activities is therefore necesarry to have access to information regarding markets. 77% respondents stated that they have satisfactory access to information, 21% states that they do not have access to information at all (Appendix Graph 4).

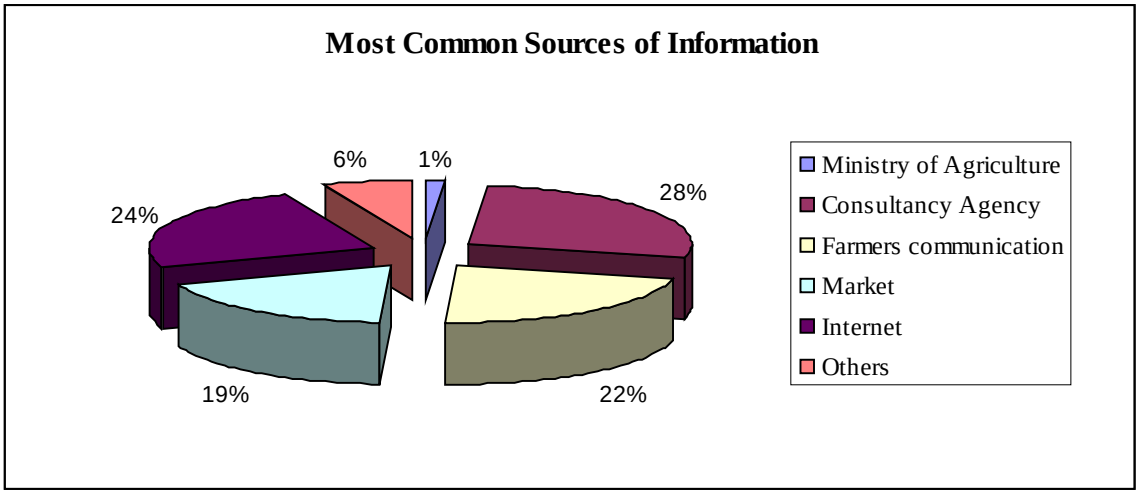
[f] *Shortened version of number of respondents.*

5.3. Summary of AMIS

According to questionnaire research results, farmers acquire many of their information from agencies providing information services, thus from local regional consultants who work for information agency ACSA. Same as in other countries where agricultural marketing systems work, information systems of similar kind (for example study from South Asia, Binayee, 2005) is one of the most effective method how to spread needed information among farmers in rural areas. Consultants are in direct contact with farmers and deliver needed information to those who do not have access to other media, from where they could obtain information (mostly internet, television, or radio). According to Seko (2009), in order to ensure sustainable agricultural development, partners within the sector (in this case ACSA Agency, Ministry of Agriculture and farmers themselves) have to develop joint collaborative action to ensure efficient and effective input or service delivery system.

Graph 1 shows total division of used information sources from all three regions together. 51% of respondents stated Consultancy Agency (mainly sourced information through ACSA consultant, eventually information provided by agency by the phone, or from internet pages of the agency) as the most used source of information. Among other often used sources in these regions, according to 44% of respondents, belongs the Internet (various portals focused on agriculture), but also 40% respondents answered farmers communication (these are smaller villages, meaning communication among individual farmers, sharing information among neighbours).

Graph 1: Most common sources of information for respondents



Source: Prepared by the researcher according to collected data

Graph 2 shows most often quoted sources of information sorted by individual villages. In Puhaceni and Delacau most often used source is Consultancy Agency as opposed to Cazanesti and Dobrogea Veche, where respondents use more information from the Internet. Reasons why respondents rather use the internet might be low awareness about Consultancy Agency (farmers do not know which specific information it provides, they do not know local consultants, who to approach), which can be caused by low frequency of education and training for local farmers or inadequate advertising. In all four villages there is percentually very similarly represented answer as to where respondents gain information - from Markets (local markets, where farmers sell their products).

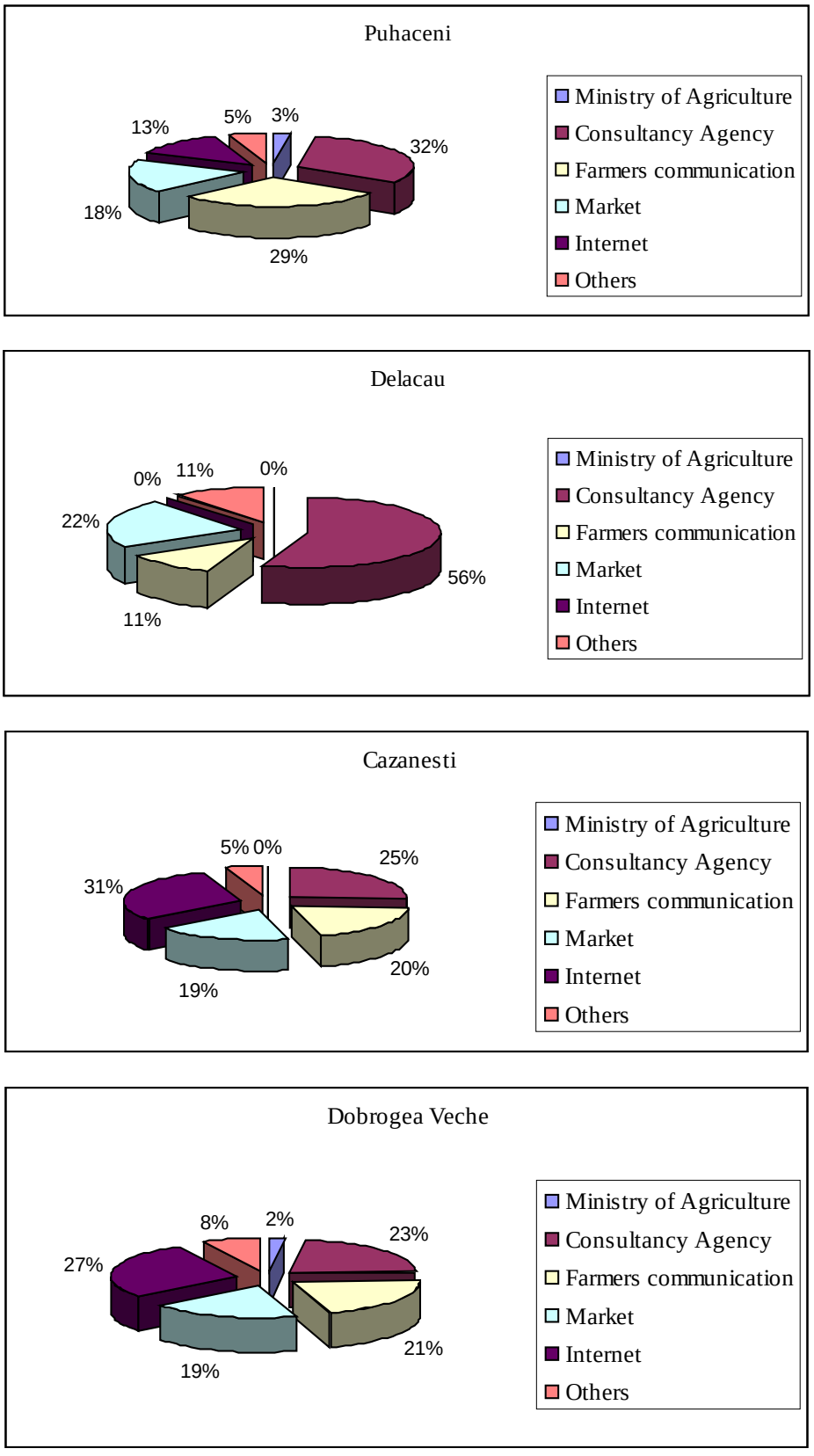
Agricultural Marketing Information System is beneficial tool for gathering information, but not all farmers know about it. Questionnaire research represents that 72% of respondents know AMIS. Respondents who know AMIS were consequently asked from where or from whom do they know about this system. At this question it was tried to weight results by using the importance (weight) of answer, therefore weighted average was used to evaluate results. Result of applied method was consistent with the most frequent answer in questionnaire research. Total of 84% of respondents know about AMIS from local ACSA consultants. Furthermore also from the internet, television, radio and newspapers. Applying weighted average it was not possible to prove compliance with frequency of respondent answers, so this method was abandoned.

There are many options to obtain information. According to study carried out in India mainly local NGOs inform about new systems and technologies, which consequently also provide directly needed information (Singh, 2012).

Total of 72% respondents stated that they know AMIS, but only 66% confirm that they use AMIS to obtain information. Lower count of users can be again caused by unsatisfactory awareness about information system or limited access to the internet. Answers interpreted positively, thus respondents using AMIS, were asked how often they use this information system. Most frequent answer was once a month.

Least awareness about AMIS and also most respondents who do not use this information system was in Dobrogea Veche village. Despite the fact that 34% of respondents do not use AMIS, 82% of respondents find Agricultural Marketing Information System benefitial and valued.

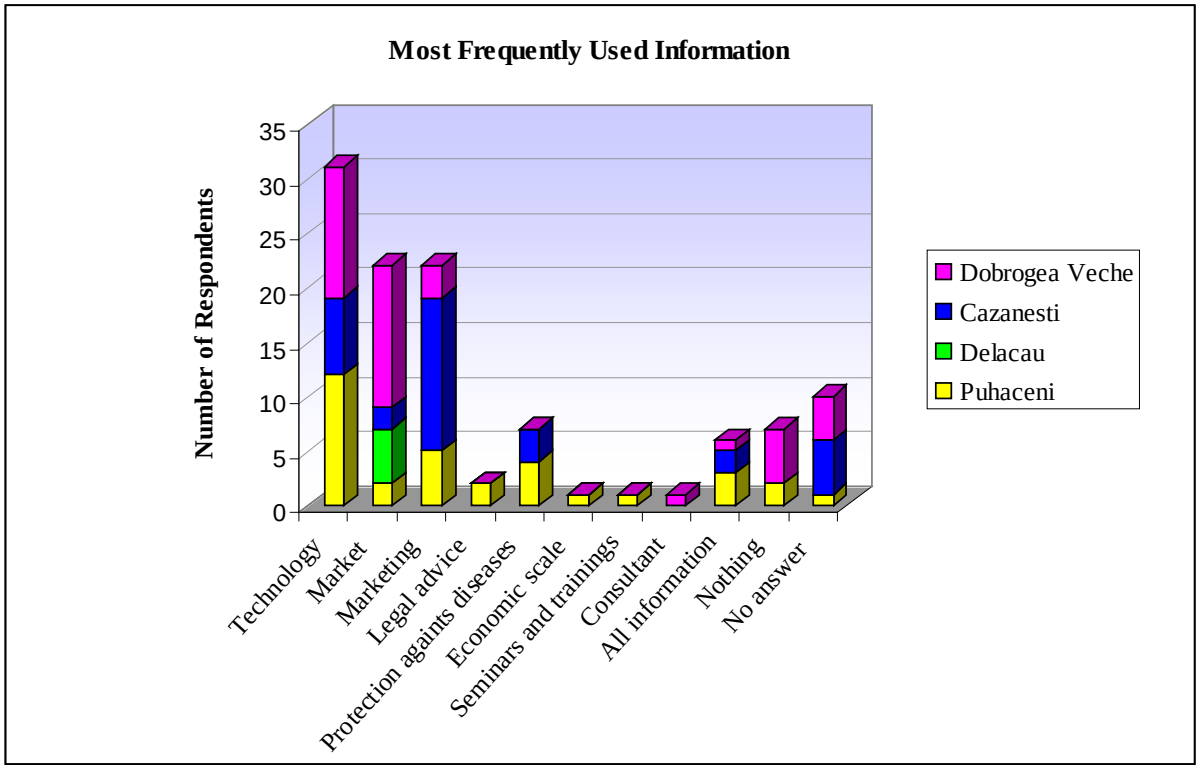
Graph 2: Most common sources of information for respondents in particular villages (Puhaceni, Delacau, Cazanesti, Dobrogea Veche)



Source: Prepared by the researcher according to collected data

Graph 3 shows most often used information from Agricultural Marketing Information System sorted by individual villages. Information in which farmers are most interested in are: 36% Technology (informaton about new technology of growing, seeding, irrigation etc.), 25% Market information (access to the market, supply and demand, information about selling and buying products, monthly prices on different markets etc.). Furthermore they use 25% Marketing information (Marketing strategy), Legal advice (Justice), information about protection againts diseases (information about new herbicides and pesticides) and also Information about seminars and trainings.

Graph 3: Most frequently used information from AMIS



Source: Prepared by the researcher according to collected data

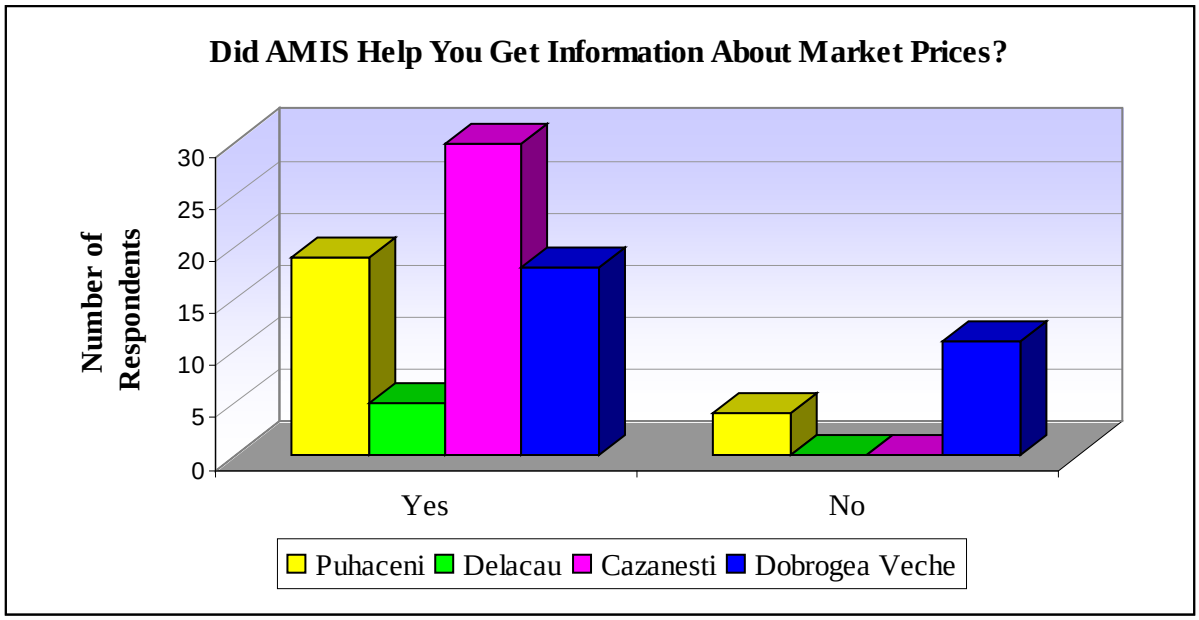
Information included in Agriculutral Marketing Information System operated by ACSA agency are similar to those provided by Marketing Information System in South Asia. MIS here mainly provides comodities and services demanded by larger group of users. According to Binayee (2005): “MIS services include frequent updates on product demand and prices, market news, market research and analysis, and customized services (feasibility study, business planning, marketing research, etc.)”.

One of the posibilities why some farmers do not use AMIS is lack of needed information. It is possible that provided information does not suit user's needs. Information can be focused for example at the other types of products. For the question what information they lack the most frequent answers were: advertising (15%), more information about demand and supply at the markets (8%), about selling prices in various districst (8%), more information about individual products (2.3%), legal advice (Justice) (1.2%) and more information in Russian language (1.2%).

Altough 8% of respondents would welcome more information from market sphere (mainly overview of up to date prices of individual products on different markets and their purchase prices). 83% responded positively at the question if AMIS already helped them to gather needed information about prices at the local markets. Graph 4 shows that most positive answers were in Cazanesti village (100% respondents from this village responded positively). On the other hand most negative answers (13%) were from Dobrogea Veche village, which corresponds with amount of respondents who do not use AMIS in this village.

76% of respondents judge agricultural marketing system positively and want to recommend it for new users to try.

Graph 4: Comparison of responses whether AMIS has helped / not helped get information about market prices



Source: Prepared by the researcher according to collected data

5.4. Statistical Analysis of AMIS Assessment

For the purposes of statistical analysis data were arranged in needed form. Respondents from Puhaceni and Delacau villages were picked as one statistical data set becouse of low amount of respondents in Delacau village. Village are situated close together and their cooperation is also very close. Statistical analysis was therefore not influenced in any way by taking this step.

Testing criteria for the following hypotesis were, on the surface of importance 0.05 (5%). Individual listings in spread analysis from R program (tables 5-9) show results of testing two conformity spreads. To prove difference between two data sets, Pr(>F) value has to be less than testing criteria 0.05.

Table 5 shows results of Analysis of Variance where corn yields (this crop was selected because it was most frequently mentioned by respondents in their questionnaires) in kilograms from individual villages and individual respondents were compared with second criteria which was usage of agricultural marketing information system. It was presumed that agricultural marketing information system does not influence amount of yielded crop in three selected districts. Table 5 shows that (p>0.05) there is no difference between two groups, therefore it is not possible to prove that using of agricultural marketing information system does not influence yield of corn.

Table 5: Extract from the Analysis of Variance in the R Programme - 1

```
> m = aov[g] (Corn_yield_in_kg~Use_of_AMIS, data)
> summary(m)
```

	Df[h]	Sum Sq[i]	Mean Sq[j]	F value[k]	Pr(>F)[l]
Use_of_AMIS	1	5394821	5394821	0.325	**0.575**
Residuals	21	348337353	16587493		

Source: Prepared by the researcher according to collected data

[g] *aov is function in programme R (mathematical software for statistics)*
[h] *number of degrees of freedom*
[i] *sum of squares*
[j] *mean size of the sum of squares*
[k] *value of the test criteria*
[l] *achieved significance level of p*

Table 6 shows results of Analysis of Variance where yields of corn (because it was most frequent answer in respondent's questionnaires) in kilograms from individual villages and individual farmers were compared with location of individual villages (located in selected district in Moldova). It was presumed that amount of yielded crop is not influenced by position of individual villages (Aneni Noi with Puhaceni, Telenesti and Singerei). Table 6 shows that ($p>0.05$) there is no difference between two groups, therefore it is not possible to prove that corn yields are not influenced by position of villages.

Table 6: Extract from the Analysis of Variance in the R Programme - 2

```
> m = aov[g] (Corn_yield_in_kg~Village, data)
> summary(m)
```

	Df[h]	Sum Sq[i]	Mean Sq[j]	F value[k]	Pr(>F)[l]
Village	1	3445988	3445988	0.207	**0.654**
Residuals	21	350286186	16680295		

Source: Prepared by the researcher according to collected data

Table 7 shows results of analysis carried out by comparison of corn yields (most frequently produced crop) with frequency of agricultural marketing information system usage. It was presumed that usage frequency of agricultural marketing information system does not influence production and therefore yield of individual crops. Table 7 shows that ($p>0.05$) there is no difference between two groups, therefore it is not possible to prove that frequent usage of agricultural marketing information system does not influence increase of corn yield in the individual villages.

Table 7: Extract from the Analysis of Variance in the R Programme - 3

```
> m = aov[g] (Corn_yield_in_kg~Frequency_of_AMIS_use, data)
2.  > summary(m)
```

	Df[h]	Sum Sq[i]	Mean Sq[j]	F value[k]	Pr(>F)[l]
Frequency_of_AMIS_use	1	17009002	17009002	1.061	**0.315**
Residuals	21	336723172	16034437		

Source: Prepared by the researcher according to collected data

Table 8 shows results of Analysis of Variance where two criteria were compared. First was individual farmer's corn yield in kilograms and second criteria was increase of production afer farmers started to use agricultural marketing information system. It was presumed that using of agricultural marketing information system does not influence production increase and therefore individual crops yields. Table 8 shows that ($p>0.05$) there is no difference between two groups, therefore it is not possible to prove that frequent usage of agicultural marketing information system does not influence increase in production and yield of corn in individual villages.

Table 8: Extract from the Analysis of Variance in the R Programme - 4

> m = aov[g] (Corn_yield_in_kg~Increase_of_production, data)
> summary(m)

	Df[h]	Sum Sq[i]	Mean Sq[j]	F value[k]	Pr(>F)[l]
Increase_of_production	1	174107	174107	0.01	**0.92**
Residuals	21	353558067	16836098		

Source: Prepared by the researcher according to collected data

Table 9 shows Analysis of Variance where two criteria were compared. First was corn yield in kilograms in individual villages, second was increase of profit from production due to use of agricultural marketing information system. It was presumed that using of agricultural marketing information system does not influence yield of individual crops and therefore increase of profit from production. Table 9 shows that ($p>0.05$) there is no difference between two groups therefore it is not possible to prove that usage of agricultural marketing information system does not influence yield of corn and therefore increase of profit from production.

Table 9: Extract from the Analysis of Variance in the R Programme - 5

> m = aov[g] (Corn_yield_in_kg~Increase_of_salary, data)
> summary(m)

	Df[h]	Sum Sq[i]	Mean Sq[j]	F value[k]	Pr(>F)[l]
Increase_of_salary	1	873047	873047	0.052	**0.822**
Residuals	21	352859127	16802816		

Source: Prepared by the researcher according to collected data

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

The main goal of the Agricultural Marketing Information System is to make search for needed information more simple and effective, that will help to increase income of moldova farmers (through information which will help to increase production) and therefore improve their standard of living. There is no other study of the topic at the moment, therefore data from previouus years are unavailable - Impact Assesment in Rural Areas of the Republic of Moldova. Due to this fact it is difficult to assess impact of agricultural marketing information system in rural areas. In this matter we can only relate on the answers of respondents gathered during the data collection.

Farmers use data from various areas, they mainly focus on information related to agricultural production such as new agricultural technology and practises, demand and supply of produced crops or information concerning marketing. Results of questionnaire research indicate interest in information offered by agricultural marketing information system. Problematic factor, which negatively influences number of AMIS users seems to be limited access to the internet or local ACSA consultants.

Altough statistical calculations does neither show direct impact of Agricultural Marketing Information System on yield of individual crops nor total increase in production which would lead to higher profits, questionnaire research among farmers indicated otherwise.

Questionnaire research indicates that Agricultural Marketing Informaton System does provide needed information which are being used by farmers to increase yield of crops and therefore higher profit from production.

Research also indicates that AMIS is percieved as a popular and useful tool by its current users, mainly among small and mid-sized farmers who want to continue using it in the future and are willing to recommend this information system to the others. Due to this, AMIS has potential to become even more popular than it is today.

6.2. Recommendations

One of the existing problems of AMIS is inadequate level of awareness about this system in selected districts. To make AMIS more useful, the most important thing that should be changed in the future is to increase awareness about this system in agricultural areas and also among individual farmers.

- More frequent education of local consultants about innovations in agriculture (new methods and technologies) so they would be able to pass newest information to the farmers.
- Increase amount of local consultants (ACSA agency workers) who will be able to spread needed information in individual districts in villages where there are no consulting centers built yet or in areas with limited internet access.
- Increase in local consultant numbers goes in relation with establishment of new education and consultation centers which potential clients will be able to approach.
- Through marketing campaign using fliers and posters, distributed in target districts and individual villages. Also potential multimedia campaign on television but mainly in radio broadcast.
- More frequent arrangement of conferences directly in selected districts, including foreign experts, concerned with problems related to selected districts.
- Arrangement of field training with local consultants who unveils new technology and new practices directly in the field.

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8. APPENDICIES

8.1. Appendix for Thesis

Appendix 1: English Questionnaire

Questionnaire

Dear Farmer,

Thank you for your time and your answers to this questionnaire to help me better understand the work with the Marketing Information System (MIS) - ACSA

Sincerely,

Czech Univerzity of Life Science Prague

---

1. Sex

❑ Male ❑ Female

2. Age

❑ < 25 ❑ 36 – 45 ❑ 56 <

❑ 26 – 35 ❑ 46 – 55

3. Nationality

4. Region

❑ Singerei ❑ Anenni Noi ❑ Telenesti

5. Locality

❑ Dobrodja Veke ❑ Casanesti ❑ Delacau

❑ Puhaceni

6. What is your profession?

7. Do you have your own land (agriculture land)?

❑ Yes ❑ No

If no, do you work in agriculture / on agricultural land?

❑ Yes ❑ No

8. How many hectars of agriculture land do you have? How many "sotka" do you have?

9. What kinds of products do you have?

10. Do you have any access to information about market?

❑ Yes ❑ No

11. Where do you get information?

❑ Ministry of Agriculture
❑ Consultancy Agency (Advisory Services)
❑ Farm / Farmer communication, Neighbor
❑ Market (Market place)
❑ Internet
❑ Others …….

12. Do you know MIS / AMIS? (Marketing Information System / Agriculture Marketing Information System)

❑ Yes ❑ No

If yes, how did you hear about MIS /AMIS?

❑ Television
❑ Radio
❑ Newspapers
❑ Internet
❑ Consultant
❑ Family
❑ Friends
❑ Market
❑ Neighbors
❑ Farmers

13. Do you use MIS / AMIS? (Marketing Information System / Agriculture Marketing Information System)

❑ Yes ❑ No

If yes, how often do you use it?

Where do you usually get concrete information? (Internet, Consultant ACSA)

14. Do you think that information from MIS / AMIS are useful and valuable?

- ❑ Yes
- ❑ No
- ❑ I do no know

15. What kind of information most frequently do you use?

16. What kind of information is missing in MIS / AMIS? What kind of information should be added in your opinion?

17. How big was your production capacity before use information from MIS/AMIS? (Kg per month)

Product	**Kg**	**Month**
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..

18. How much does your production increased after you start use information system?

- ❑ Twice
- ❑ Three times
- ❑ Four times
- ❑ Other

.....

19. Did AMIS help you obtain information about prices at the market?

- ❑ Yes
- ❑ No

20. How much does it cost one kilogram of production at the market on different month?

Product (Kg)	**Month**	**Lei**
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..
……..	……	……..

21. How much does your salary increased after you start use Information system?

- ❑ Twice
- ❑ Three times
- ❑ Four times
- ❑ Other

.....

22. Would you like to recommend MIS/AMIS to other people?

- ❑ Yes
- ❑ No

Appendix 2: Russian Questionnaire

Анкета

Уважаемые фермеры, мы сердечно благодарны Вам за Ваше время и Ваши ответы на вопросы в этой анкете, которые позволят нам изучить работу Маркетинговой Информационной Системы (МИС) - ACSA

С уважением,

Чешский университет естественных наук, город Прага

---

1. Ваш пол

❑ Мужской ❑ Женский

2. Ваш возраст

❑ < 25 ❑ 36 – 45 ❑ 56 <

❑ 26 – 35 ❑ 46 – 55

3. Ваша национальность

4. Ваш регион

❑ Singerei ❑ Anenni Noi ❑ Telenesti

5. Ваша деревня

❑ Dobrodja Veke ❑ Casanesti ❑ Delacau

❑ Puhaceni

6. Какая Ваша профессия?

7. Имеете ли Вы свою собственную сельскохозяйственную землю?

❑ Да ❑ Нет

Если нет, работаете ли Вы в сельском хозяйстве?

❑ Да ❑ Не

8. Какой размер Вашей сельскохозяйственной земли ? Сколько соток или гектаров?

9. Какие сельскохозяйственнысе культуры Вы выращиваете?

10. Имеете ли Вы доступ к информации о сельхоз продукции и о ситуации на местных внутренних рынках Республики Молдова.

- ❑ Да
- ❑ Нет

11. Откуда восновном Вы получаете интересующую Вас информацию ?

- ❑ Министерство Сельского хозяйства
- ❑ Консультационные Агенства
- ❑ От других фермеров, соседей
- ❑ Прямо на рынке
- ❑ Интернет
- ❑ Другое …….

12. Знаете ли Вы Маркетинговую Информационную Систему (МИС) ACSA ?

- ❑ Да
- ❑ Нет

Если да, откуда или от кого Вы о данной системе узнали?

- ❑ Телевидение
- ❑ Радио
- ❑ Газеты
- ❑ Интернет
- ❑ Консультанты
- ❑ Семья
- ❑ Друзья
- ❑ Рынок
- ❑ Соседи
- ❑ Фермеры

13. Пользуетесь ли Вы Маркетинговой Информационной Системой (МИС) - ACSA

- ❑ Да
- ❑ Нет

Если да, то как часто Вы пользуетесь информацией из этой системы?

Информацию Маркетинговой Информационной Системы вы получаете по интернету или у консультанта ACSA?

14. Является ли информация Маркетинговой Информационной Системы (МИС) – ACSA для Вас полезной и эффективной?

- ❑ Да
- ❑ Нет
- ❑ Не знаю

15. Какую информацию из этой системы Вы восновном используете?

16. Какая информация на Ваш взгляд отсутствует в данной системе?

17. Какой был объём Вашей продукции по месяцам в килограммах перед тем как Вы стали использовать данную систему для получения информации?

Продукт (культура)	Кг	Месяц
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

18. Насколько повысилась Ваша продукция после того, как Вы стали использовать Маркетинговую Информационную Систему (МИС) – ACSA?

- ❑ В два раза
- ❑ В три раза
- ❑ В четыре раза
- ❑ Другой ответ .....

19. Помогла ли Вам Маркетинговая Информационная Система (МИС) - ACSA получить информацию по ценам продукции на рынке?

- ❑ Да
- ❑ Нет

20. Сколько стоит один килограмм Вашей продукции на рынке в определённые месяца? (напишите пожалуйста месяц и цену Вашей продукции в данном месяце).

Продукт (культура) 1 Кг	Месяц	Лей
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

21. Насколько повысилась Ваша прибыль от продажи Вашей продукции, пользуясь инфомацией данной системы о существующих реальных ценах (минимальных и максимальных) на рынке?

- ❑ В два раза
- ❑ В три раза
- ❑ В четыре раза
- ❑ Другой ответ .....

22. Хотели бы Вы порекомендовать Маркетинговую Информационную Систему своим знакомым и другим фермерам?

- ❑ Да
- ❑ Нет
- ❑ Не знаю

8.2. Supportive Appendix Tables

Appendix Table 1: Distribution of respondents by profession in villages

Profession	Puhaceni	Delacau	Dobrogea Veche	Cazanesti	Absolute frequency
Accountant	4	-	1	1	6
Agronomist	1	1	1	-	3
Assistant	2	-	2	-	4
Kontrolor	1	-	1	-	2
Cooker	-	-	1	2	3
Driver	2	1	1	-	4
Economist	1	-	-	1	2
Engineer	1	-	1	-	2
Farmer	2	-	-	1	3
Houskeeper/Nanny	1	-	-	7	8
Mechanic	-	-	4	-	4
Musician	-	-	-	1	1
Other	3	-	3	2	8
Physician/Nurse/Technician	1	-	4	2	8
Postman	1	-	-	-	1
Keller	2	-	1	-	3
Teacher/Help Teacher	1	1	5	13	20
Zootechnic	-	1	4	-	5

Source: Prepared by the researcher according to collected data

Appendix Table 2: Overview of sizes of agricultural land by villages

Land size hectars	Puhaceni	Delacau	Cazanesti	Dobrogea Veche	Absolute frequency
< 0.49	5	-	4	13	22
0.5 - 0.6	-	-	4	8	12
0.61 - 0.7	1	-	4	3	8
0.8 - 0.9	1	-	2	-	3
1.0 - 1.5	5	-	6	1	12
1.6 - 2.0	4	3	1	1	9
2.1 - 4.0	2	2	2	1	7
4.1 - 6.0	-	-	2	-	2
> 6.1	3	-	2	1	6
Unknown	2	-	3	1	6

Source: Prepared by the researcher according to collected data

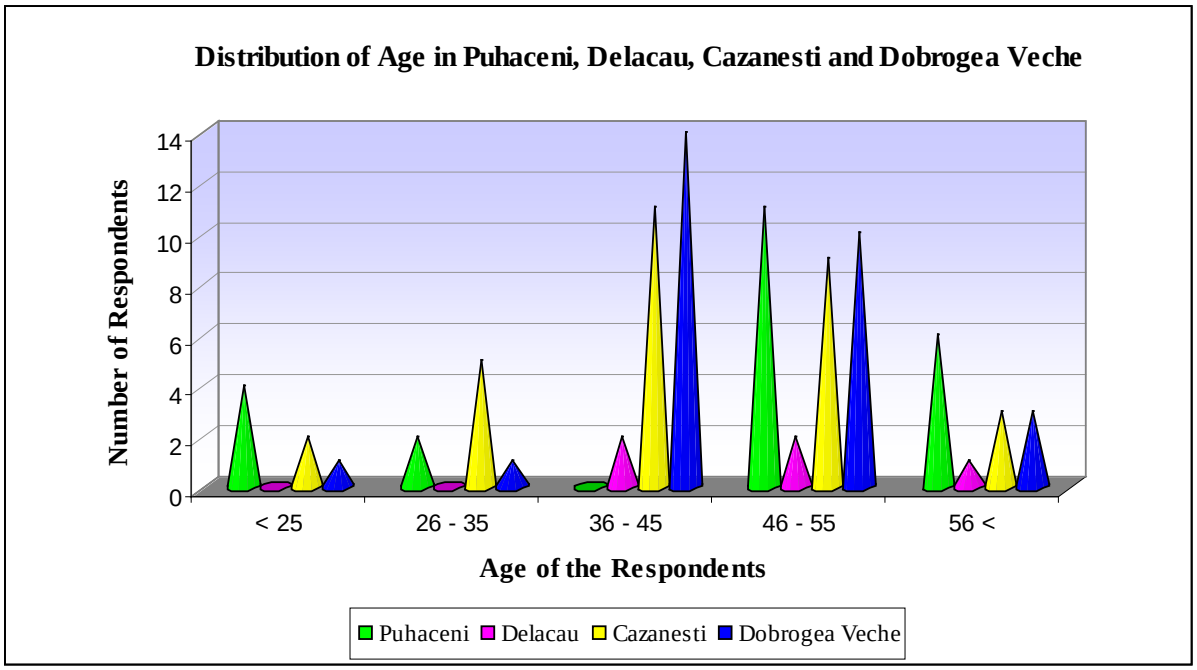
Appendix Table 3: Products grown by respondents in each village, absolute and relative frequency

Type of product	Puhaceni	Delacau	Cazanesti	Dobrogea Veche	Absolute frequency	Relative frequency in %
Apricot	1	-	1	1	3	1.1
Barely	1	-	-	-	1	0.4
Beans	-	-	-	8	8	2.8
Beet	-	1	1	4	6	2.1
Blackberries	-	-	6	2	8	2.8
Cabbage	2	1	-	1	4	1.4
Carrot	-	1	-	4	5	1.8
Corn	8	3	27	9	47	16.5
Cranberries	-	-	-	1	1	0.4
Cucumber	2	-	-	3	5	1.8
Eggplant	-	1	1	1	3	1.1
Garlic	-	-	-	5	5	1.8
Gooseberry	-	-	-	1	1	0.4
Goud	-	-	-	1	1	0.4
Grapes	2	-	1	1	4	1.4
Honey	-	-	1	-	1	0.4
Kind of grass	1	-	-	-	1	0.4
Nuts	1	-	-	-	1	0.4
Onion	4	1	-	7	12	4.2
Other vegetable or fruits	4	1	16	1	22	7.7
Peach	1	-	-	-	1	0.4
Peper	4	1	9	2	16	5.6
Pork	-	-	1	-	1	0.4
Potatos	4	1	1	10	16	5.6
Raspberries	-	-	3	20	23	8.1
Roses/Flowers	-	-	-	18	18	6.3
Sour cherries	-	-	-	1	1	0.4
Strawberries	-	-	-	9	9	3.2
Sunflower	4	1	9	9	23	8.1
Sweet cherries	-	-	-	1	1	0.4
Tomatos	11	2	5	4	22	7.7
Unknown	3	-	-	2	5	1.8
Watermelon	3	-	1	-	4	1.4
Wheat	1	1	3	-	5	1.8

Source: Prepared by the researcher according to collected data

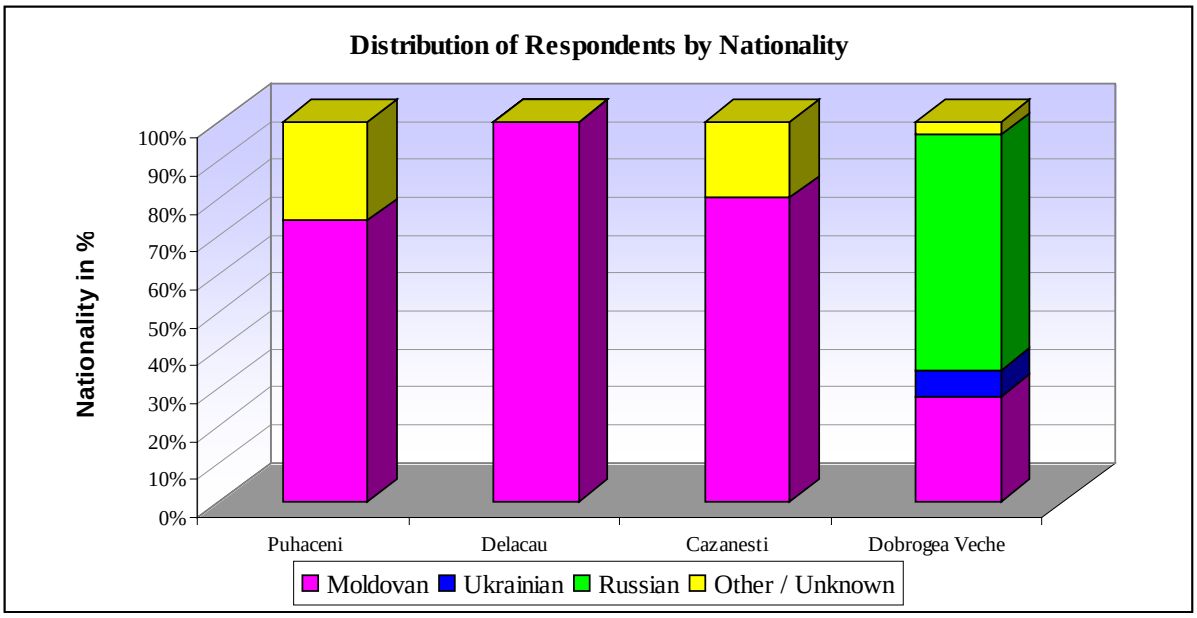
8.3. Supportive Appendix Graphs

Appendix Graph 1: Distribution of age in villages Puhaceni, Delacau, Cazanesti and Dobrogea Veche



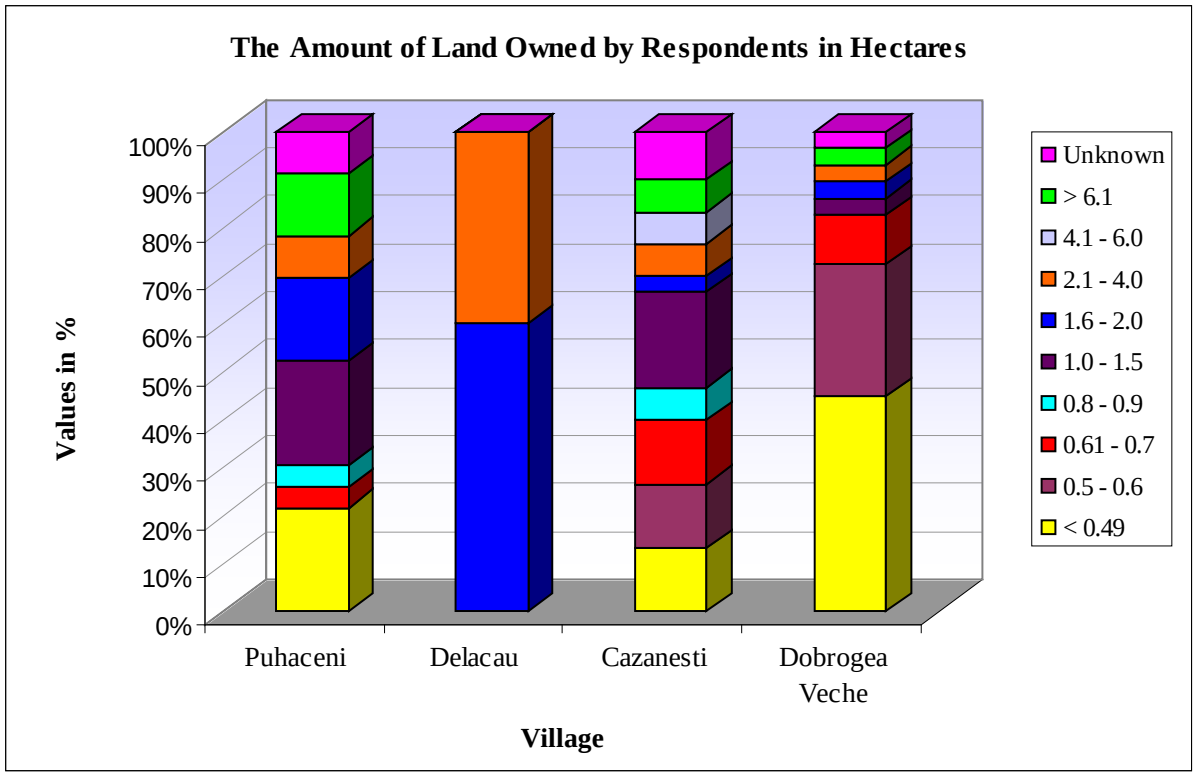
Source: Prepared by the researcher according to collected data

Appendix Graph 2: Distribution of respondents by nationality



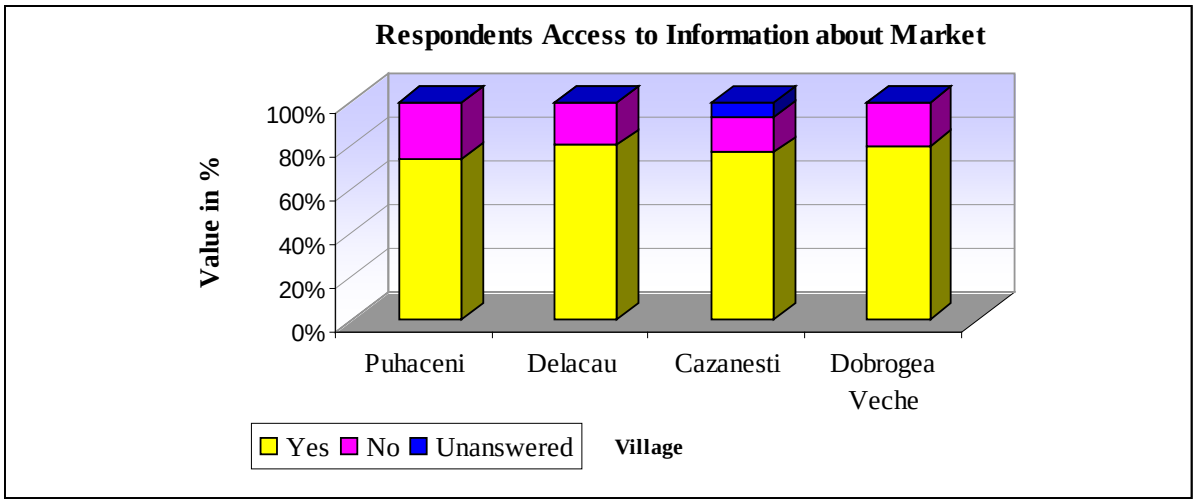
Source: Prepared by the researcher according to collected data

Appendix Graph 3: Size of the land owned by respondents in hectars



Source: Prepared by the researcher according to collected data

Appendix Graph 4: Respondents access to information about market



Source: Prepared by the researcher according to collected data

8.4. Documentary Photos

Photo 1: Visit to Agricultural University in Chisinau, 2012

Source: Author's photo

Photo 2: Training Conference in Puhaceni, 2012

Source: Author's photo

Photo 3: Field ork, filling out the questionnaire in Puhaceni, 2012

Source: Author's photo

Photo 4: Excursion of agricultural land, Puhaceni 2012

Source: Author's photo

Photo 5: Participation in the work process in Puhaceni, 2012

Source: Author's photo

Photo 6: Functionality test of equipment in Puhaceni, 2012

Source: Author's photo

Photo 7: Excursion of agricultural land in Dobrogea Veche, 2012

Source: Author’s photo