Armenian Women for Health and Healthy Environment" (AWHHE) and
Women in Europe for a Common Future (WECF)

Armenia

SOCIO-ECONOMIC AND GENDER SURVEY OF HAYANIST, FANTAN AND DZORAGHBYUR

For the TMF project:

"Tapping resources"

Solomiya Babyak (WECF)
Kitty Bentvelsen (FEM-CONSULT)

August 2005

Currency and Equivalent Units

Currency Unit = Armenian Drams (Dram)

	February 2005
Dram/US$	498
Dram/EURO	598
US$/EURO	1.20

For convenience, this report present all prices in Armenian Drams (AMD) and/or US Dollars (USD), as USD is the second major currency after drams for Armenian people. Even during the survey, respondents often expressed amounts in US dollars rather than in drams, using as a standard the rate of 500 drams in a dollar.

Poverty line

The first Millenium Development Goal (MDG 1) is to eradicate extreme poverty and hunger. The target (i.e. Target 1) linked to this goal is to halve, between 1990 and 2015, the proportion of people whose income is less than 1 USD per day. Consequently, the first indicator related to MDG 1 is the proportion of the population whose income is below 1 USD/day. However, a higher poverty line such as 2 USD/day is considered more appropriate for European and Central Asian (ECA) countries given the extra expenditure on heat, winter, clothing and food. Therefore, in this report we assume that poverty line is equal to 2 USD.

TABLE OF CONTENT

1. INTRODUCTION

Starting from the late 1980s Armenia came through many hardships. First of all, the devastating earthquake in 1988 with its epicentre in the north-west of the country took many lives and destroyed livelihoods, houses and infrastructure. Secondly, the collapse of the Soviet Union in the early 1990s caused huge economic disruption which lead to the closure of big industrial and military enterprises. And last but not least, there was the impact of the war with Azerbaijan over Nagorno-Karabakh which involved open hostilities between 1992 and 1994 and now has the status of a frozen conflict. As a result, the relationships with neighbouring countries were (and still are) paralysed with the borders with Azerbaijan and Turkey still remaining closed. The isolation has a dramatic impact on transportation, energy supply and country's overall economy. In the mid-nineties the population of Armenia went through winters of severe hardship. The loss of the Azeri population combined with the influx of large numbers of Armenian refugees from the enclave further complicated the economic situation and the management of livelihoods. According to the Poverty and Social Impact Analysis (2003)[1] poverty in Armenia is widespread with 54% of the population having consumption levels below the poverty line of 2 USD per day (i.e. poverty line for countries with cold climates, see page 2).

In 2005 the leading Armenian NGO "Armenian Women for Health and Healthy Environment" (AWHHE) in partnership with Women in Europe for a Common Future (WECF, the Netherlands) started the TMF[2] project "Tapping resources" in Armenia, see 1.1 below. This report presents the findings of three short surveys conducted in February and March 2005 in the three project villages. The objective of the survey was to gain more insight in the socio-economic and gender situation of the villages in order to facilitate appropriate implementation of the project activities.

1.1 The Project

The TMF project "Tapping resources" is funded by the Netherlands Ministry of Foreign Affairs. It consists of subprojects in three countries: Armenia, Uzbekistan and Afghanistan. The subprojects are united by the common theme "Water, Sanitation and Environment". The overall goal of the "Tapping resources" project is to reduce poverty and to improve environmental and living conditions through the implementation of applied, sustainable water, sanitation and agricultural projects; capacity building; and increasing democracy. Strengthening the position of women on all levels will be integrated in the project activities. One of the project components is the identification and implementation of demonstration projects in three project villages: Hayanist, Fantan and Dzoraghbyur. The project will contribute to the realization of – among others – the Millennium Development Goals, in particular to "Ensuring Environmental Sustainability" (MDG 7), specifically Target 10 on Water and Sanitation.

1.2 Methodology

In early February 2005 a project planning workshop took place in Yerevan with participants of the involved partner organizations. During these meetings the participants presented the project areas and their problems, and short introductory visits to the three project villages in Armenia took place, including first meetings with resource persons. On this basis a checklist for informal surveys was developed as well as more formal questionnaires, and the actual survey was planned, all together with AWHHE. Two types of questionnaires were developed, a "long" and a "short" one. The long questionnaire was meant to give more in-depth insight in the general living conditions of the inhabitants of Hayanist, whereas the short interviews focused on a limited number of issues that had been selected as output and impact indicators of the project, see Annex 1 and Annex 2.

[1] Alan Roe, Annie Feltham, Armenak Darbinyan, Ruben Yeganyan, Nelson Shakhnazaryan, Lilit Melikyan, Ashot Kakosyan (2003) Poverty and Social Impact Analysis

[2] TMF means "Thematische MedeFinanciering" in Dutch; in English: Thematic co-financing programme

Interviews were conducted in the second half of February 2005. In the beginning in each village several open, informal interviews were held with representatives of households, using a kind of Rapid Rural appraisal (RRA) methods, using checklists to guide the discussions and allowing to follow-up of interesting issues. On this basis the questionnaires were adjusted where necessary, and in each village a number of long and short interviews were held. The selection of the households for the interviews was "purposely", aiming to include representative households from different parts of the village, as well as from different socio-economic classes. The intention was to interview a more or less equal number of men and women, of different age groups and of different household categories. In reality, however, it appeared that women were over-represented among the respondents. Through these interviews qualitative rather than quantitative data were collected. In addition, several more resource persons were interviewed, see also table 1.1.

Table 1.1 Overview of types and numbers of interviews conducted

Method of interviews	**Number of interviews**		
	Hayanist	**Fantan**	**Dzoraghbyur**
Informal interviews using checklist	7	8	8
Interviews using long questionnaire	11	3	12
Interviews using short questionnaire	22	20	18
Interviews with resource persons	6	4	3

The checklist and long questionnaire was established based on the common gender analytical framework (see annex ..) and covered productive and reproductive roles, community participation, health, education and needs and priorities. The focus was on water, sanitation and waste issues and the use of chemical fertilizers and pesticides as the key issues of the project are eco-sanitation, safe drinking water, waste management and agriculture. The issues of poverty, employment (or rather lack of employment opportunities) and the "unsocial" health care system were brought up on the agenda by the respondents. Due to the number of issues to be discussed, and the maximum duration of an interview (about 50-75 minutes), it was not always possible to elaborate on all the issues during each interview, but overall the main issues could be covered.

1.3 Acknowledgements

The author would like to thank all people interviewed for their kindness, willingness to share the often very personal information about their life and living conditions, and hospitality. Thanks go to all the members of AWHHE who were very helpful, made practical arrangements for our visits and provided background information, especially to Elena Manvelian, the director of AWHHE. Special thanks go to Emma Anakhasyan, Lucine Babayan and Knarik Grigoryan for their patient translations despite biting frosts and for conducting further interviews. The author is tremendously grateful to Kitty Bentvelsen, as without her significant input this survey would not be realised.

2. Summarised findings

Employment, Income and Poverty

Poverty in Armenia is widespread with 54% of the population having consumption levels below the poverty line (Poverty and Social Impact Analysis, 2003). The conducted survey demonstrated that approximately 90% of the population in the project villages are living under this poverty line. Poverty is worse in Fantan and Hayanist than in Dzoraghbyur. The main reason of poverty is the extremely high unemployment rate. In 40% of the interviewed households none of the family members of working age is employed. In addition, salaries of employed respondents and/or of their employed household members are generally low, with more than half of them having salaries below 30,000 dram/month (60 USD/month). The reported salaries varied from 15,000 up to 150,000 dram/month, (i.e. 30 – 300 USD/month). In many households (especially in Fantan and Hayanist) the only income for families are the pensions of older family members, which often does not exceed 10 to 20 USD/month. There are some households that do not have any regular income at all. Besides the lack of cash, the livelihood situation of most households is undermined by the inability to cultivate sufficient (or even any) fruits and vegetables in the homestead for own consumption.

Expenditure

The major expenditures for the respondents are food, fuel and utility costs (electricity, water, etc). Almost all respondents stated that they spend more than 50% of their income on food. In reality, however, the expenditure on food is sometimes much less (especially in Hayanist) as the biggest proportion of incomes, especially in winter time, is spent on fuel (e.g. wood, bottled gas or centralised gas heating) and people are forced to save on food to pay their utility bills or to buy wood. In Fantan, nearly half of the households are not able to pay for any of the utilities as these costs exceed their incomes. Many households in Fantan therefore do not use gas, whereas the water supply in the village was cut off due to the unpaid bills. Another major expenditure is on health care services and medicines, at least, if households can afford it, or if they receive help in cash from relatives. If they would have some extra money, quite some respondents would spend this on a hospital, a doctor and/or a dentist. In addition, expenses on health care are very high in comparison with the level of incomes and start from 20 USD for a check by a doctor (Fantan and Dzorapbpyur respondents), 80 USD for a delivery (respondent from Hayanist) to 220 USD for an eye operation for a child (respondent of Fantan).

Land and agriculture

All households of Fantan and Dzoraghbyur, and most of Hayanist, own agricultural land (0.5 to 5 ha) in addition to their yard or homestead. At present few households cultivate all the land they have. They either have discontinued cultivation (about one-fourth in Dzorahgbyur and one-tenth in Fantan) or cultivate only part of their land, keeping the remaining part fallow (about half of the households). The main reasons for this include a) the high costs for inputs; b) the absence of irrigation; c) the low harvests and/or low market prices; and d) poor soils, especially in Hayanist. The main crops that are cultivated are grains (mostly wheat but also barley, rye and oats) and animal fodder (mainly hay). In Fantan there is no cultivation in the homestead gardens because there is no water for irrigation. In Hayanist and Dzoraghbyur, where water for irrigation is available, households cultivate vegetables and fruit trees in their homestead gardens. Agriculture at homesteads and in fields could be greatly improved if the irrigation situation would be improved.

Use of chemical fertilizers and pesticides

The use of chemical fertilizers and pesticides significantly decreased during the last 15 years, mainly because households do not have sufficient money to buy them. Between one-fourth and one half of the households involved in agriculture use nitrogen fertilizers nowadays; no other fertilizers are used. The amount applied per hectare varies from 20 to 625 kg, with the highest amounts used in Hayanist, and with 100 to 200 kg/ha as most often mentioned. The use of organic fertilisers is very low because

manure is mainly used as fuel, especially in Fantan, but also in Hayanist. In Dzoraghbyur relatively more manure is used as fertiliser.

Pesticide use is the highest in Hayanist. Three-fourth of the respondents from Hayanist apply pesticides in their gardens, often 3 to 4 times per season. The pesticides that are mostly used are Karate and B-58 (in Hayanist and Dzoraghbyur). The use of prohibited (e.g. DDT) or extremely hazardous pesticides ("Metaphos" (parathion methyl)) was also registered in Hayanist. Pesticides used in Dzoraghbyur and Hayanist are mainly against caterpillars and aphids, whereas in Fantan most pesticides are against rodents.

Water

The three project villages have different problems regarding water.

- Hayanist has problems with the quality of the drinking water, the overflow and pollution (with sewage) of drainage waters and the absence of proper irrigation water (instead, drainage water is used for irrigation, where possible).
- In Fantan there is a source of safe drinking water, which, however, is often cut off because the inhabitants are not able to pay the water fees. Therefore, water is used from an old and unprotected source with water of often poor quality. This situation causes regular outbreaks of infectious diseases, such as an outbreak of tularaemia in 2003. For Fantan's inhabitants another main problem is the absence of irrigation; the old system collapsed in the early 1990s and never was rehabilitated.
- Dzoraghbyur suffers most from the poor quality of its drinking water. The sources of drinking water are not protected, and are polluted by waste water and seepage from manure heaps. Also in Dzoraghbyur there are regular outbreaks of intestinal diseases, even in winter time. In summer water is in short supply, because then the pumps are working only a few hours per day to save on energy costs. Some households that are situated at the end of a pipeline even do not receive any water at all. Irrigation water is only available for a limited number of households; however, this water is polluted by sewage. The absence of irrigation water in the remaining part of the village is also considered as a major problem.

In all three villages much water gets wasted during winter because water is supplied 24 hours per day, as otherwise the pipe systems get frozen. However, in Hayanist water is wasted all year long as the sources are artesian wells.

Sanitation

The sanitation infrastructure is also different in the three project villages. A large majority of the households in Fantan and Hayanist have conventional pit-latrines, whereas most Dzoraghbyur households have flush-toilets, although they still use conventional pit-latrines in addition, mainly in the winter. The sewage water from the flush toilets flows into basic septic pits or tanks (Dzoraghbyur) or into drainage channels (Dzoraghbyur and Hayanist). The water that is used for irrigation in both Hayanist (water from drainage channels) and Dzoraghbyur (water from an artificial lake) is contaminated by wastewater, including sewage from the flush toilets.

Solid waste disposal

None of the project villages has an established service for waste collection. Instead, people either dispose their waste at illegal dumps or burn it. It is common to burn plastic waste as well, even indoors (as fuel), especially among the poorest households. The illegal dump sites create many nuisances, for example, causing waste to be blown down to the street of the village (complaints from Fantan), or spreading a bad odour in the neighbourhood (complaints from Hayanist).

Health

In all three project villages, poverty has the greatest impact on human health. Almost all households are insufficiently heated; the costs for medical care and medicines are far above the households' capacities to pay and many therefore do not get the treatment and medicines they actually need. Poor and even under-nutrition is prevalent in Fantan and Hayanist.

The state of drinking water supply and sanitation is very poor and, consequently, affects human health. Outbreaks of infectious diseases are common in all project areas, as is the incidence of intestinal parasites.

Community participation

The participation of inhabitants in any (organised) community activities is very low in all surveyed villages. In most villages there is only an elected village council and a parents' committee at school. After the collapse of the Soviet Union the clubs and other organizations stopped their activities, thus diminishing social contacts. However, it is an Armenian tradition to help neighbours in need and also in the project villages it is rather common that younger neighbours help the elderly ones or some better-off people help there poorer neighbours. In Dzoraghbyur the respondents showed a good interest in participation in a (project related) community committee and in the possibility to influence decision-making processes at local level. The interest in such committees in Hayanist and Fantan was rather low. However, respondents in these two villages suggested that it would be nice to have a village club (again) so that (young) people can communicate with each other and be involved in social activities.

Gender issues

- There is a quite rigid gender division in Armenia, even though in Soviet times the roles of men and women were proclaimed equal. Most women are housewives whose responsibilities are housekeeping and taking care of children. Men, in turn, are responsible for earning money and for agricultural activities. Mainly in case the husband is ill or handicapped, the burden of agricultural activities becomes the wife's responsibility or the household quits this activity.
- "Housekeeping" in rural Armenia often includes activities such as baking bread, milking cows and making cheese and preservation of vegetables and fruits. Certain heavy tasks such as fetching water (if no home connection) are often done by women, men and/or children.
- More women are unemployed than men. However, many (married) women without a job consider themselves as housewives and do not see themselves as unemployed.
- Some husbands do not allow their wives to work, even if a household could well use the additional income.
- It is common that men are the main decision-makers outside the households, i.e. at community level. In Fantan and Dzoraghbyur all members of the village council, as well as the mayor, were male. In Hayanist, however, three of the seven village council members are women. The fact that the population of Hayanist has an urban background (mainly refugees from Baku) may play a role in this.
- Decision-making at household level can be different. In some households the husband is the main decision-maker, in a few it is the husbands' mother (i.e. the mother-in-law of the wife), but there are also households where husband and wife together take decisions. In Hayanist it is also common that women are the main decision-maker about how money is spent.
- More women have completed higher education than men, although the costs involved make that at present not all graduates from secondary school who are interested in higher education can also achieve this. Some young men therefore rather choose for the Military Academy, which is free of charge, instead of other higher educational institutes.

Main problems of the project villages according to the perception of the respondents

Common priorities for all three villages are to improve the drinking water supply and the irrigation situation, repair the village roads and to open a club (many respondents regret the closure of the clubs that were functioning during the Soviet times). Priorities that were more specific to one village:

- Hayanist: connecting households to the central gas supply system (even though many households would not be able to pay the gas bills), addressing the unemployment problem and establishment of a proper waste collection system;
- Fantan: establishment of a kindergarten and addressing the unemployment problem;
- Dzoraghbyur: having a public bath-house, improvement of the telephone connections and rehabilitation of the previously existing sewage system.

Main recommendations

- In all three project villages it is important to raise awareness among the inhabitants about environmental issues, hygiene and sanitation, including about the need to reduce the use of pesticides, as well as its impact on human health and on alternatives to control pests.
- In all three villages the quality of and access to drinking water needs to be improved.
- Also irrigation needs to be improved or re-established in the three project villages, because proper irrigation significantly improves the opportunities for profitable agriculture and therefore is directly linked to the improvement of livelihoods in the villages as well as poverty reduction.
- The schools in Hayanist and Fantan urgently need improvements of the toilets, and ecological toilets (in particular dry urine-diverting toilets) are recommended. The directors of both schools expressed their interest and cooperation in constructing such ecosan toilets for their schools.
- In Dzoraghbyur the present situation of sewage disposal needs an urgent attention. It should be investigated whether the old sewage system can be rehabilitated or whether another solution is required, as the improvement of drinking water system without the improvement of the sewage situation is little sensible.
- In all villages attention should be given to proper waste disposal, including awareness raising about the health effects from burning plastic.

This report describes each of the project villages in separate chapters: Chapter 3 presents the findings for Hayanist, Chapter 4 – for Fantan and Chapter 5 – for Dzoraghbyur. At the end of each chapter conclusions and recommendations are provided for each project village.

3 FINDINGS HAYANIST

3.1 The village of Hayanist

The village of Hayanist belongs to the district of Masis of Ararat marz (province). The distance to the town of Masis (with a population of approximately 19,000) is about 6 km and to Yerevan, the capital of Armenia, about 15 km. The village is connected by road with Yerevan, Masis and the surrounding villages. Public buses go every hour to both Masis and Yerevan. Only the main streets in the village are paved with asphalt. The other streets have no pavement and are muddy during part of the year. The part of the village where several asphalt roads meet is considered as the central part of Hayanist, with the health centre, the school, a bus-stop and few small shops (like a bakery and an agro-chemical shop). The mayor's office is nearby.

In the past Hayanist was inhabited by Azeri people. During the Armenian-Azerbaijan conflict, the Azeri people from Armenia fled to Azerbaijan (1988), whereas Armenian people, who used to live in Azerbaijan, fled to Armenia. In 1989 Hayanist became fully inhabited by such Armenian refugees. At present, the village population consists of 90% former refugees and 10% native Armenians who comparatively recently moved into the village.

According to the mayor of Hayanist has 2440 inhabitants and over 900 households. Women are overrepresented due to migration of men. The mayor of the village informed that Hayanist has comparatively many pensioners: *"it's like a house for elderly people here"*. The conducted interviews, however, had rather many respondents of a comparatively young age or from the families with children. Therefore, pensioners may be underrepresented in this survey.

Hayanist consists of stone one- or two- storey private houses, which are common in rural Armenia. The mayor of Hayanist reported that there are 950 houses in the village, part of which are empty. Of nearly half of the families either one or few of its members or the entire family migrated abroad in a search of work. Due to the difficult financial situation of the family members who stayed behind, many of them went to live under one roof with relatives as it is easier to survive. During the survey it was difficult to ascertain whether indeed some houses were not inhabited, because the yards in Hayanist are separated from the streets by high stone fences.

At the outskirts of Hayanist there is an area where refugee families live in wagons. These families received the homestead land from the government or bought it themselves, with the intention to construct an own house. However, due to unemployment and/or low incomes they do not have sufficient money for this. Some of these people (still) do not have passports and therefore are ineligible to receive any subsidies from the government, aggravating their financial position.

Hayanist is situated in a basin-shaped and swampy area with a (very) high groundwater table. The village and surrounding fields are covered with a net of drainage channels, including small and shallow drainage channels along each street.

3.2 Characteristics of the respondents and their households

During the survey in Hayanist 6 interviews were conducted with resource persons, such as the mayor, the school principal, health centre staff and the saleswoman of an agro-chemical kiosk. 18 "long" interviews and 22 "short" interviews with inhabitants were conducted (see also section 1.2 on methodology). The long interviews, in particular, were meant to give insight in the general living conditions of the inhabitants of Hayanist, whereas the short interviews focused on a limited number of issues that had been selected as output and impact indicators of the project. This report is mostly based on the information collected by the long interviews. Of the 18 respondents of the long interviews, 13 were women, 2 men and in 3 interviews husband and wife together answered the questions. The age of the respondents varied from 25 years to over 60, but with a majority in the age group of above 40 years. Most respondents and their older household members have secondary education. Only in one of

the 18 interviewed families all members had received (or were receiving) university education, while in another family two children were university students.

The 18 respondents represented the following type of households:

- One third consisted of two parents and 2-3 (unmarried) children of different age groups;
- Four respondents represented extended families (parent(s) with married children with or without grandchildren) and one respondent a joint family (married brothers with their families).
- Four respondents were from older (mostly pensioned) couples, whose children left home; and
- Two respondents lived alone (a widow and a widower, respectively).

3.3 Work, Incomes and Expenditure

Employment

Employment opportunities within Hayanist are very limited. Except the school, the health care centre, the mayor's office and a few small shops, there are no other employers. There are also very few employment opportunities outside Hayanist, and in general it is considered very hard to find any job, especially for young people. According to the mayor of Hayanist the only options for young people are either to migrate to Russia in search for (mostly illegal) jobs or to join the military service.

The survey confirmed that the problem of unemployment in Hayanist is indeed severe. Of the 18 interviewed households, 14 include one or several members who are of working age (36 persons in total). Only 3 of these 14 households have one or more members who are actually employed. And of the 36 individual household members of working age (this number excludes students and handicapped persons), only 6 receive wages or salaries; the other 30 persons (i.e. 80%) either are unemployed or consider themselves as housewives. Five of the 18 households generate own income by producing and selling agricultural and livestock products.

Incomes

For one third of the interviewed households the pensions of one or more family member(s) form the main income. Monthly pensions of respondents varied between 5,000 and 11,000 drams (approximately 10 – 22 USD), with an average of 7,000 drams (14 USD).

Salaries are higher than pensions but still are low considering the costs of living. For example, the monthly salary of the Secretary of the mayor's office is 45,000 drams (90 USD), of a mechanic 25,000 drams (50 USD), and for a "good" job of a person with higher education 85,000 drams (170 USD). A realistic range of salaries was difficult to establish in this survey as 80% of the respondents and their family members are unemployed. However, most household incomes (from pensions, salaries, agricultural sales and/or subsidies) seem to fall in a range of 15,000-25,000 drams/month per household.

Income of the households who depend (largely) on sales of agricultural products, varies significantly with the highest reported income being 180,000 drams/year (gross, i.e. without deducting input costs). In addition, it is common to exchange (barter) products from one's own garden for items of necessity or other food products. One respondent who mentioned that the only income of her family is from agricultural sales (in this case selling milk products from the only cow of the family) reported that her family cannot afford to consume milk, not even their children. Their income from selling milk is approximately 2,500 – 3,000 drams per week.

When the reported family incomes are converted to income per person, the resulting per person income varies from 3.4 to 91 USD per month (compare with the world-wide accepted poverty line 2 USD per **day** per person[3]).

Incomes versus Expenditures

The respondents outlined that the major expenditures in their households are on food, fuel, clothes, electricity and water. All respondents mentioned that food is their main expenditure taking more than 50% of the total household income, even though approximately three fourth of the households do produce some food by themselves and even prepare preservation for winter. However, when analysing the replies of 11 respondents who provided sufficient details on their expenses, the expenditures on food sometimes can be much less than 50%, as the biggest proportion of the incomes of many households, especially in winter time, are spent on fuel (e.g. wood and bottled gas) and people are forced to save on food to pay their bills. Still many of the respondents only manage to heat one room in the house, preparing food on the same stove used for house heating. Electricity costs form also a major expense. The respondents pay between 800 and 15,000 drams per month for their electricity bills, which corresponds to 32kW and 600kW per month, respectively. Especially the poorest families try to save on electricity, for example, by only using one bulb in the whole house and not switching on their TVs and refrigerators.

The best-off family among the respondents (with a total household income of about 372 USD per month) spends approximately 8% of their income on fuel, water and electricity. For some families this sum (about 30 USD) is their whole monthly income. Such families hardly have any money to buy clothing or other non-food items.

3.4 Gender issues

During the interviews in Hayanist various gender issues arose:

- It was more often mentioned that daughters attend universities than sons. This might be explained by the fact that (1) male students prefer to go to the Military Academy (as for free) and (2) because for especially men it is sometimes easier to find employment as a wage labourer (e.g. as a migrant worker in Russia) than as an academic.
- Unemployment is very high, especially among women. Out of 14 interviewed households with adults in the working age group, only in one of them a wife was employed (and also her husband). All unemployed married women stated in the interview that they are housewives, while all unemployed unmarried women were referred to as unemployed.
- One respondent mentioned that her husband does not allow her to work even though he himself is unemployed.
- There is a clear division in gender roles within the households. Women are mainly involved in housekeeping and taking care of children, whereas men are responsible for the work "requiring more physical strength", including in agriculture and livestock. Only 3 out of 11 respondents mentioned that also the women from their households are fully involved in agriculture activities. In one of these cases the husband is handicapped and thus the entire work load fell on his wife's shoulders.
- Most women in Hayanist think that men should be responsible for the decision-making process outside the household, for example, several women respondents expressed explicitly that the members of a community committee should be men. However, the fact that 3 out of 7 elected members of the village council of Hayanist are women, demonstrate that practice can deviate from traditionally held views.
- In contrary to decisions outside the households, decisions about spending money within the households are either taken by both husband and wife or exclusively by women.

[3] see note on page 2

3.5 Community Activities and Social Support

The participation of the population in any formal community activities in Hayanist is very low, also caused by the few community organizations that are presently active in Hayanist (the elected village council and the parents committee in the school) and the absence of any community facilities such as a club or a sports ground. Out of 11 representatives of the households who discussed this, only one mentioned that someone of her family participates in an (organised) community activity as a member of the parents committee of the school. In various interviews the possible establishment of a community committee (as part of the current TMF project) to discuss and find solutions for problems in the village was discussed and respondents were asked who in their opinion should be a possible member of such a committee. Several respondents mentioned that "*nobody should go in such a committee*", one respondent stated that she does not know, 3 respondents said that this is a men's task, and only one woman -after long deliberations- said that she herself could become committee member, but she observed that: *"people do not like me because I am very straightforward"*.

Informally people are more socially active. Several respondents mentioned that they solve common problems together with their neighbours and they always can ask their neighbours for help. For example, the inhabitants of one of Hayanist's streets constructed by joint efforts a deep artesian well and thus solved the drinking water supply problem for 20 families. The same people clean their drainage channel themselves and do not wait for any official drainage cleaners to come.

In case of any private problems, slightly more than half of the respondents said that they have someone they can turn to for help. Nearly half of the respondents, however, either said that there is nobody they can ask for help or that it is useless to ask anybody for help and, thus, they prefer not to ask. Certain people who belong to vulnerable groups (e.g. disabled and families with more than 3 children) receive some government subsidies (PAROS program).

3.6 Land and Agriculture

Land Ownership

Most inhabitants of Hayanist moved into this village in 1988 when Armenia still was part of the Soviet Union. At that time the newcomers, besides a small homestead garden, could receive a piece of land for private use for free from the state. After the collapse of the Soviet Union the land was privatised (1991-1992) and land received from the state became private property. The in-migration, however, still was ongoing but the newly arrived people could not get any land for free anymore. They were allowed to buy 800 m^2 for the construction of a house, of which approximately half would be occupied by the house and surrounding yard, leaving about half for a homestead garden. Therefore, the size of land available for any agricultural production varies from 0.03 ha for those with only a homestead to maximum 0.45 ha for those with additional crop land. 11 out of 18 interviewed households mentioned that they own at least 0.1 ha land.

Agricultural production

At present there is little commercial agricultural production in Hayanist. However, 13 out of 18 respondents are involved in land cultivation on a relatively small scale, including homestead gardens. Land availability is not a constraint, but the main problem is that agricultural production in Hayanist is not considered profitable because of various reasons:

1) *The quality of the land is considered very poor and yields are low*. The soil in Hayanist is regarded as little suitable for agriculture due to high groundwater table (in some places up to 0,3 m below ground level) and a "high" soil salinity was reported. The high ground water level does not allow growing orchard trees, while herbs and vegetables with short root system need irrigation in summer. In one part of the village the soil seems comparatively better and the people who have their fields and gardens there grow vegetables and some also wheat.
2) *Many households consist mainly of elderly people who do not have sufficient physical strength anymore to work on the land*.

3) *People are not willing or not able to engage in agricultural activities because they have no experience, skills and knowledge on agriculture as they originate from urban area (e.g from Baku).* Moreover, there is hardly any experience available on how to deal with the specific agricultural problems of Hayanist.
4) *Absence of mechanisation together with lack of money to buy inputs.*
5) *High land taxes.* Land owners have to pay state taxes for land amounting from 5,960 up to 18,200 dram/ha per year depending on the soil properties and proximity to the house (12-36 USD/ha per year). This particularly constraints the purchase of extra land.

As a result of these constraints, agricultural production in Hayanist is generally limited to subsistence agriculture. Although not found among the respondents, there is apparently at least one commercial farmer who keeps a considerable number of sheep and cows and also cultivates land). It was also reported that the previous Azeri inhabitants were more successfully involved in agriculture, but no further information was available.

Despite the low harvests and small scale, growing vegetables for own consumption is a great help for improving the livelihood of households. In Hayanist mainly tomatoes, cucumbers, paprika's, eggplants, aubergines and herbs are grown. The harvest is mainly used for own consumption and for preservation. Some households cultivate potatoes, especially where the soil has comparatively better properties and the groundwater level is not very high and if a household has enough money for inputs (e.g. to buy seed potatoes).

Out of 13 households that cultivate crops, seven sell (some) of their agricultural produce. For two of them the sale of produce forms the only household income whereas for three other households it is a significant part of their total income. The income from selling agricultural produce varies considerably. Respondents mentioned gross sales incomes from 30,000 to 180,000 dram/year.

Nearly half of the respondents mentioned that they cannot cultivate all of their gardens or fields, mainly because of absence of irrigation. They have from 60% up to 95% fallow land.

Use of fertilizers

In total forty respondents (of both the long and short questionnaires) have been questioned about the use of agrochemicals. The following results were found:

- 19 respondents (approximately two thirds of those who are involved in agricultural production) use chemical fertilizers.
- The amount of chemical fertilizers used varied per household from 20 kg/ha up to 625kg/ha. The majority of the households (13 out of 19) use fertilizers in a range between 20 kg/ha and 100 kg/ha. The five households whose incomes are (mainly) based on revenues from agricultural sales (mainly selling vegetables) use more fertilizers (250 – 500 kg/ha) than average. Households often buy one bag of mineral fertilizers (app. 40-50 kg) for their field. But as the size of their fields differs, so does the load of fertilisers.
- Few respondents use organic fertilizers (either cow manure or chicken dung, depending on the kind of livestock kept by a household). Only a few households buy cow manure to fertilize their garden.
- The main reason why not so many households use animal manure is because only few households keep cattle and/or poultry.

Use and handling of pesticides

In Hayanist the use of pesticides is common for vegetables and potatoes and there are several outlets that sell pesticides, see also Box 3.1. Many respondents complained that crops in Hayanist are not "healthy". Out of the 40 respondents, 25 (almost two-thirds) use pesticides seasonally in their garden. Ten respondents use at least two types of pesticides. When asked which pesticides households use, the following were mentioned: "Karate" (14 times), "B-58" (9 times), "Metaphos" (5 times), DDT (2 times), "Chlorophos" (2 times), "Dimethoate" (1 time). In vegetables pesticides such as Karate and B-58 are mainly used, whereas "Metaphos", "Dimethoate" and "Karate" are used against Colorado Potato Beatle (CPB). Respondents who use pesticides apply them on average 3 to 5 times per season.

Various of the above mentioned pesticides are considered as hazardous or very hazardous. "Methaphos" (parathion methyl) corresponds to WHO I-A class ("extremely hazardous" pesticides). WHO strongly recommend that the pesticides from I-A class are not be used especially in developing countries. "Methaphos" is a cholinesterase inhibitor and is suspected as an endocrine disruptor. "Dimethoate" belongs to WHO class II ("moderately hazardous" pesticides) and is believed to be a possible carcinogen, cholinesterase inhibitor and reproductive toxin. Last but not least, the use of "B-58" is prohibited by private households in the Russian Federation.

Box 3.1 The agricultural kiosk

This agricultural kiosk is situated opposite the school. It consists of two small rooms, separated one from each other by a plastic transparent wall. In one of the rooms the saleswoman sits surrounded by containers and packets with seeds of crops such as tomatoes, paprika, aubergines, cucumbers, water-melons, Lucerne and fennel. In the other room the agro-chemicals are kept. Here one can find a variety of pesticides for vegetables, fruit trees and flowers. The most common pest allegedly affecting crops in Hayanist are greenflies, Colorado Potato Beatle and caterpillar. Among the pesticides for sale are: "Karate", "Konfidor" (imidacloprid), "Aktara", "Skor", and B58. According to the saleswoman, the most sold pesticide is "Durzban" (chlorphyriphos, WHO class II pesticide – moderately hazardous).

In the shop the pesticides are stored in bulk (large packages or containers). The consumers buy the pesticides in small amounts. The saleswoman repacks the pesticides in empty bottles (e.g. using a funnel). When she handles pesticides, she uses protective clothes, gloves and a mask. In the kiosk is a strong and sharp smell of chemicals. The pesticides, which are imported from China by the kiosk owner, are considered a profitable business, whereas selling seeds is less profitable. The saleswoman, who has a degree in biology, provides advice to customers, in particular regarding pesticides.

There are several other places in Hayanist where pesticides can be purchased. The handling and storing of pesticides in this particular kiosk is relatively good in comparison with the other shops.

Of the 25 respondents who use pesticides (either by themselves or by a household member), 7 said that some kind of protection is used during spraying, mostly a protective mask and/or special working clothes. Eight respondents complained about their own health or the health of their family members after applying pesticides. The most mentioned complaints were headaches and allergies. Even in three of the 7 households where protective clothes and/or masks are used, the person spraying the pesticides still had health complaints afterwards. Two of these respondents mentioned that they use DDT and one of them even consulted a doctor, which means that the symptoms were serious[4]. The other pesticides after whose application health complaints occurred were "Karate" and "Metaphos". Out of 14 households, who use "Karate", in four the applicant reported health complaints; of the five using "Metaphos" three applicants did. In addition to the unsafe handling of pesticides, the storage of pesticides in recycled bottles (e.g. of soft drinks) reportedly is said to sometimes lead to accidental intoxications.

Livestock

According to mayor of Hayanist, only a minority of the households keep cows, with generally one cow per household. Chicken and turkeys are common as poultry. Pigs, goats or horses are not common.

Of the 40 interviewed households, 10 keep cows, mostly one or two cows per household. One respondent, however, keeps 10 cows and calves, a pig, 10 sheep and 50 chickens. This is also a respondent whose only income is from selling livestock produce such as milk, meat, eggs and wool.

[4] In Armenia people tend to consult a doctor only in case of serious symptoms and if home treatment does not help (due to the relatively high costs of the health services).

Of the 18 households respondents questioned about keeping any poultry, 8 have chicken and 2 have both chicken and turkeys. The number of chicken per household is low. Out of the ten households with poultry, only 4 keep in total more than 10 chicken and turkeys.

Gender Roles in Agriculture

As mentioned before, men are generally responsible for tasks that require more physical strength and a majority of the respondents mentioned that in their households men are responsible for agricultural. Nevertheless, the respondents indicated that many agricultural tasks are done by both men and women, for example land preparation, weeding and harvesting. Fertilizer application and spraying of agrochemicals are mostly done by men. Depending on the household, either a woman or a man is responsible for selling produce.

3.7 Water Sources, Quality and Uses

Water Sources and Water Quality

The main sources of drinking water in Hayanist are artesian wells (i.e. which do not require pumps), whereas approximately 90 households are connected to a drinking water system that receives water from the Yerevan system. There are 17 functioning artesian wells in the village, mostly between 50 and 100 m deep. Many households got connected to one of these wells on their own initiative and now have a water supply directly into their yards; only few households have an in-house water connection. Officials such as the local authorities call both these connections to water sources as centralised. Households who were not able to get connected are fetching water with buckets. As the deep wells are situated along streets near the houses, the distance for fetching water is not big. Only for the households living in wagons the distance to a water source is relatively far (often 500 m or more).

In official documents the water of the deep wells is classified as water for irrigation and officially drinking water in Hayanist does not exist, except for the 90 households connected to Yerevan's system. This situation apparently stems from the government policy not giving permission to use artesian water as drinking water. Part of the respondents have been satisfied with the quality of artesian water, moreover, the price for artesian water is considerably lower (as it is classified as irrigation water) than the price for drinking water from Yerevan. However, this does not mean that all inhabitants are able to pay even for the artesian water on a regular basis. However, in practice it means that the deep well water neither receives a special treatment nor that any protection zones around the wells are maintained. Many wells are situated unacceptably close to yards where animals and manure are kept and to drainage channels, which convey waste water and sometimes also sewage water. Thus there is a high risk that the water of the wells becomes microbiologically polluted or contaminated by parasites. The water quality significantly decreases during the summer when the consumption of water increases. High consumption reduces the pressure in the pipes allowing polluted groundwater to penetrate into the system. The chemical parameters of the artesian water are in general good. The found nitrates concentration in the water samples of Hayanist is under the EU limit of 50 mg/l, but the registered concentration of 30 mg/l NO_3 indicates a light anthropogenic pollution.[5] The presence of nitrates in artesian water could be an indication of microbiological pollution, which, however, has not been investigated at the time the survey was done.

The perception of the quality of their drinking water by the inhabitants of Hayanist is presented in the Table 3.1 below. Almost half of the respondents are not satisfied with the quality of their drinking water. Most unsatisfied respondents complain about a high salt content in the water and/or its hardness. Indeed the results of the water analysis from one well in Hayanist showed high concentrations of sulphates (190 mg/l), however, this level of concentration remains within the EU standards (EU standard = 250 mg/l).

[5] Margriet Samwel. 12.03.2005. Analysis results of water samples of 3 project villages in Armenia. Internal WECF report.

TABLE 3.1 WATER SOURCES AND PERCEIVED WATER QUALITY

Hh no	Water source	Perceived Water Quality	Remarks of respondents
1	Yerevan drinking water pipeline	Good	Some part of the pipe near the house freezes in winter time
2	Artesian water connected to the yard of the house	The water is salty and not suitable for drinking but they got used to it	They boil the water for drinking
3	Yerevan drinking water pipeline connected to the yard	Good	When the water supply is interrupted they fetch the water from the spring and boil it
4	Artesian water from spring in 900 m	Water has lots of salts	
5	Artesian water from spring in 700 m	Not very good	Boil water for children to drink
6	Artesian water close to the house	Water has lots of salts and rotten smell	Their cattle drink water from the same source and have worms in the liver because of water quality, but household members do not boil water for themselves before drinking
7	Artesian water close to the house	Good quality and clean	The depth of well 80 m. They made a well by themselves
8	Artesian water in 10 m from the house	Pleased with the quality	
9	Artesian water in 10 m from the house	Satisfactory	
10	Artesian water in 5 m from the house	Normal quality	
11	Artesian water in 10 m from the house	Salty water, poor quality	Drink only boiled water
12	Artesian water and from the central water supply	Very poor quality, water contains rust because the system is outdated	
13	Artesian water	Good quality	
14	Artesian water, pipe connection from the spring	Unsatisfactory for drinking purposes, contains lots of salts	This water is good for irrigation
15	Artesian water connected to the yard of the house	Unsatisfactory for drinking purposes, contains lots of salts	This water is good for irrigation
16	Artesian water connected to the yard and the kitchen	Not good	Boil water before drinking
17	Artesian water connected to the yard	unsatisfactory	
18	Artesian water connected to the yard	unsatisfactory	

Use of Water

Water is used for consumption, cooking, cleaning and laundry. In general, people in Hayanist use a rather low quantity of water compared to urban households and even less if they do not have a connection in their house or yard. If there are babies in the family or if the household keeps livestock (cows) the use of water is higher (100-150 l/day per household). Also in summer the amount of water

used is higher. However, due to the type of water abstraction (the deep artesian groundwater is under a high pressure and flows out of the pipes by itself) the amount of wasted groundwater in enormous.

The abundance of artesian water makes people of Hayanist perceive water as a free commodity. Households that are interested in receiving safe drinking water and who can afford to pay for it are connected to the centralised water supply system from Yerevan and pay for the actually consumed water according to a water meter. Sometimes the supply of water from the centralised system is interrupted and water has to be fetched from the closest spring instead.
Houses with a bathroom are scarce in Hayanist only 2 out of 18 households have an indoor bath. Some households have a bath outdoors in their yard, with a metal tank as a bath tub. In summer they fill it up with water, which is warmed by the sun during daytime and people can thus have a warm bath by the end of the day. In the rest of the year people have to wash themselves inside the house using a basin. Some people mentioned that they go for a bath to some other places, e.g. to a sauna in Yerevan.

Most households in Hayanist do not have washing machines or have old ones that are not functioning anymore and therefore they have to wash their laundry by hand. Out of five respondents who mentioned that their family has a working washing machine, four stated that these are very old but luckily still functioning.

Almost all respondents would like to have their drinking water supply improved and they are even willing to pay (something) for water, despite their generally meagre incomes. The amount most often mentioned as a water fee for improved drinking water supply was 1000 drams per month. Only one of 7 respondents is willing to pay for drinking water on the basis of a water meter.

Drainage Water and Water for Irrigation
Hayanist has two divergent water problems that constrain agricultural activities in this area. The high groundwater level does not allow growing fruit trees, whereas irrigation in the summer would be required for successfully growing herbs and vegetables with short root systems. In the absence of proper irrigation facilities, 10% of the respondents use drainage water for irrigation, either for their garden or for a field. At the same time they are charged for using this water as if it were irrigation water. A few respondents complained that they have to pay for using drainage water for irrigation whereas actually the water does not even reach their field.

The village has a dense system of open drainage channels that run along almost every street and across the agricultural lands. However, also due to the basin-shaped area which prohibits easy natural drainage, the constructed drainage system does not (sufficiently) prevent the too high ground water tables. One of the consequences is that houses are humid, even with mouldy walls. Another problem is that households with flush toilets dispose their sewage water directly into the open drainage channels, seriously affecting the water quality in the drainage channels, and consequently also the quality of irrigation water. In Soviet times there were filters in the drainage channels in order to prevent clogging by relatively big objects such as tree branches, stones etc., but currently they do not function anymore. Many respondents complained about the pollution of the water in the drainage channels, especially as caused by sewerage *("it terribly stinks*"). Because the drainage channels are not regularly cleared, they overflow in some places flooding yards and roads. Some respondents claimed that if they had drainage water for irrigation reaching their fields, they could grow wheat and thus increase their incomes[6]. Due to these problems, most respondents are not satisfied with the current irrigation and drainage situation in Hayanist.

According to the mayor of Hayanist, the water state committee (department of the Ministry of Agriculture) is responsible for the operation and maintenance of the drainage channels in the village.

[6] Because wheat is a rather extensive crop, irrigation of wheat is often little feasible: the (additional) costs often exceed the benefits. Therefore, if the provision of irrigation water for wheat production is considered, a realistic cost-benefit analysis is required.

The channels are cleared only once in 2-3 years as it requires much labour, but this is not sufficient to prevent drainage water from overflowing, especially in spring.

3.8 Sanitation, Water and Waste Disposal

Sanitation

Most households in Hayanist have pit-latrines with a pit of less than 1 meter deep, due to the high groundwater level. When the groundwater level rises, it enters the pits and gets polluted by faecal material, because most of the pits are not sealed. Only five respondents mentioned that their pit is sealed, either by concrete walls (4 respondents) or a metal reservoir (1 respondent). When latrine pits get full, most households cover the pit with soil and dig a new pit in another place in their yard, moving the walls of the toilet. Those households that have sealed pits hire a service to empty them (once in 2-4 years) or empty them on their own and throw the waste into a nearby ditch.

Box 3.2 Sewage systems in Armenia

In Armenia, all urban areas, including the district centres, are served by sewer systems, as are some 20% of the rural settlements. All waste water from (rural and semi-rural) population centres with sewer systems is discharged without treatment into open bodies of water, with the exception of the town of Artashat, which has biological ponds. Apart from a number of small, primitive and relatively ineffective waste water treatment plants, the Republic has 20 large urban treatment installations carrying out a series of processes for treatment and disinfection of waste water. However, all without exception fail to provide an adequate level of treatment and disinfection of waste water, principally because of insufficient design capacity and ineffective operation as a result of poor maintenance. The treatment installations at Yerevan are thus able to treat only 40% of the waste water produced, those at Vanadzor only 48% and those at Oktemberyan some 75%.

Source: World Health Organization (WHO.) 2001. Highlights on health in Armenia. Electronic version: http://www.euro.who.int/document/e72377.pdf

Nearly one-third of the interviewed households have flush toilets, often in addition to a conventional pit-latrine in their yard. Some households have the flush toilet indoors, others outdoors in the yard. As mentioned, the wastewater from such toilets goes directly (e.g. without any treatment) into the open drainage channels, because there is no central sewage system in Hayanist.

More than half of the respondents are not satisfied with their current sanitation. For the majority of the unsatisfied respondents the biggest problem is the absence of a shower or bathroom, rather than the outdoors pit latrine. Only a few respondents mentioned here the state of the drainage channels as a priority problem. One respondent was literally in despair because of the drainage channel with floating excrements close to her house.

Grey Water and Solid Waste Disposal

All villagers of Hayanist dispose their "grey" waste water[7] into drainage channels. There is no garbage collection system in the village, however, there is site allocated as a landfill for solid waste at the outskirts of Hayanist. This place is not prepared as a proper dump – it is just a site where people can throw their solid waste. Villagers who live close to this landfill complained about the smell, although only few respondents replied that they bring their garbage to the landfill. The other respondents either burn their waste in their yards and/or throw it at illegal sites closer to their homes. Almost 85% of the respondents burn waste: either all or part of it. Almost half of 40 respondents throw their waste at unauthorised sites such as along a road or drainage channel or into a nearby ditch. A few respondents have a garbage pit in their own yard where they throw their waste. More than half of the respondents who burn waste also burn plastic. Most burn plastic outdoors, except for 4 respondents who burn it in

[7] Grey water is defined as waste water excluding toilet sewage water. Thus grey water includes waste water from cleaning, laundry, etc, and is usually less (microbiologically) polluted than mixed sewage water.

their stoves inside their houses. 7 respondents said to be aware that burning plastic can affect human health, but they still burn it anyway. None of the respondents who burn plastic indoors were aware of the harmful effects of burning plastic.

All respondents are highly interested in having an appropriate waste collection system in the village and all are willing to pay for such a service, although most can only afford very small amounts. This lack of ability to pay may be one of the reasons why there is no waste collection system in Hayanist.

Organic Waste and Composting

There are two types of organic waste in Hayanist: animal dung or manure and garden or crop waste. Not many people keep livestock in Hayanist and there is a shortage of manure. Out of the 15 respondents who are keeping cows or other livestock, 5 respondents dry manure and use it only as a fuel. Six respondents use manure both as a fuel and as a fertilizer for their gardens or fields, whereas four respondents use it mainly as a fertilizer. Some respondents even buy manure to use it as fertilizer, while another few use poultry dung as fertilizers. Only three respondents out of ten who use manure as fertilizers do some composting. One respondent described how: *"We scatter the manure on the land in autumn, leave it there through the whole winter long, and in spring time we just plough and sow the land"*.

Garden or crop waste is not popular as fertilizer in Hayanist. Only four respondents (of 33 with whom this was discussed) stated that they compost garden waste and use it as fertilizers. One respondent said that in their household crop leftovers are not collected, but are left on the land through the winter and in spring they plough it into the land. The other 28 respondents burn their garden or crop waste.

3.9 Health, Diet and Hygiene

The health centre of Hayanist is described in box 3.3.

Box 3.3: Health Care Centre (feldsher station) in Hayanist

Primary health care in Hayanist is provided through the local *feldsher* station, with a standard staffing structure of two doctors: a therapist (general practitioner) and a paediatrician. The feldsher station is also staffed by middle-level medical personnel, including a midwife, and provides basic care for children and adults, care for pregnant women and emergency care, and assesses the physical development of children.

The health care centre is situated in a relatively new two storey building, of which the ground floor has not been finished although it was built several years ago. All staff works on the first floor and, in winter, stay in one room, as it is warmer there. The patients also wait for their turn in the same room, as the corridor is not heated.

The inhabitants of Hayanist can receive primary health care here but many prefer to go to Yerevan or other cities as it is believed that the hospitals in the cities have better trained staff and are better equipped. As health care is not free for adults, patients tend to ask for doctor's help only in extreme situations, and, in such cases they prefer to go directly to a hospital. Therefore, the local health care centre is not well able to register the real health situation of the population of Hayanist.

According to the survey, the most common diseases among children are respiratory infections and intestinal infections (diarrhoea, parasites, etc.) while adults are reported to suffer from arthritis, high blood pressure and endocrinological disorders, e.g. related to the thyroid or pancreas glands. Many health problems of the inhabitants of Hayanist seem to be caused or affected by the poor environmental or living conditions, for example, as houses are not well heated and damp during the cold season. According to the therapist there are 5 or 6 inhabitants of Hayanist who have a chronic form of tuberculosis. This disease is said to be brought to the village by the workers from Russia. In general a main cause of poor health is the poverty of its inhabitants.

Health care is not free and health insurance does not exist in Armenia. People have to pay for each visit to a doctor and for medicines; only the most vulnerable groups are exempted, see also box 3.4. Many inhabitants of Hayanist cannot afford proper health care services such as a visit to a doctor or the prescribed medication. Many respondents indeed complained that they have health problems but cannot afford any treatment or cannot get a required operation. Some respondents who have to spend on health related costs complained that they hardly have any income left to survive. For example, a respondent, whose family's only income is the pension of her mother-in-law, told that nearly all this money was spent on medication for her mother-in-law suffering from diabetes. Apparently, the pensioners in Hayanist are not aware of the new regulation that people over 65 years of age can have free medical examination.

Box 3.4: Health Care in Armenia

During the Soviet times health care in Armenia was for free. In 1996 the Medical Care Act, which legalized funding from a variety of sources (such as the State budget, municipal budgets, medical insurance and direct payment by the patient) was adopted. As a result, health care expenditure by the State dropped from 5% to 1.3% of the GDP in 1997 (for example, in EU health care expenditure in 1998 was almost 9% of the GDP; in NIS countries on average it is app. 3%). The steep drop in Armenia's GDP in the 1990s still has a very adverse effect. The resources allocated to health care by the State are only sufficient to provide care for the most vulnerable population groups (children under the age of 7; the disabled; war veterans; children below the age of 18 with a single parent; families with four or more children; families of war victims; prisoners; children of disabled parents; Chernobyl clean-up workers; and rescue workers). Since recently people of above 65 years of age can have a free medical examination. At the time of the survey, legislation for introducing health insurance in Armenia was under preparation.
The costs of health care services are extremely High in relation to average incomes in Armenia. Operations in hospitals may cost several thousands of US dollars. Therefore, many citizens of Armenia have to borrow big sums of money for their operations, after which they have to work for several years in order to return the debts. More lucky people get financial help from their relatives who live abroad. If there is no possibility to get or borrow the money, people are forced to renounce the operation. Thus it has become common nowadays that people only visit a doctor in extreme situations.

Based on the results of survey and the source: World Health Organization (WHO.) 2001. Highlights on health in Armenia. Electronic version: http://www.euro.who.int/document/e72377.pdf

The status of people's health in Hayanist also appears to be affected by the sanitation conditions and the quality of the drinking water. The health centre staff reported regular outbreaks of diarrhoea in summer, occasional outbreaks of Hepatitis A and regular intestinal parasites infections among children. However, it is very difficult to assess the real scale of such infections because –as described in Box 3.2- the involved costs make that people are not keen to consult a doctor.

The food intake of the respondents of Hayanist consists mainly of bread, potatoes and grains. The consumption of eggs and milk products depends largely on a household's own production: if a family does not keep chicken or a cow, its consumption of eggs and milk is very low. Almost all respondents hardly consume meat or fish. Most of them just started laughing when they were asked how often they consume meat: *"we eat meat only on holidays such as Christmas, Easter and sometimes for birthdays"*. The consumption of fruits and vegetables is generally limited to the amount the households can cultivate in their yards, which is often not much.

Almost half of the respondents think that the quality of drinking water might affect their health or the health of their family members. A few respondents consume only boiled water. These are mainly people with higher education or are from households where members suffered from intestinal disorders. Several respondents assume that arthritis is caused by the poor quality of their drinking water, in particular, by a too high salt content and/or hardness.

About one third of the respondents think that the type and condition of their sanitation (toilets and sewage disposal) affect their health or the health of their family members. In particular, the poor state of the drainage channels is believed to have a big impact on their health, especially when the channels overflow and drainage water floods their yards, and sometimes even their houses.

Awareness about personal hygiene seems comparatively low among the inhabitants of Hayanist. When the respondents were asked when, in their opinion, it is necessary to wash hands, the most common responses were: *"Always"*, *"In the morning" and/or "after every work"*. One response was as follows: *"you need to wash hands when they are dirty"*. Only four respondents mentioned that hands should be washed before a meal, and another four stated that they should be washed after visit to a toilet.

3.10 Main problems of Hayanist as perceived by the respondents

The respondents were asked what they perceived as the main problems in Hayanist. The following problems and issues were mentioned[8]:

1. the absence of gasification, in particular for heating purposes (11 respondents)
2. the roads need to be repaired and asphalted (7)
3. the issues of drinking water supply (6 respondents, however, most of them were suggesting to install an appropriate centralised water supply system)
4. the irrigation situation (6)
5. the absence of appropriate waste collection (3)
6. the absence of the village club (3)
7. the high level of unemployment (2)
8. the difficult access to drinking water for the inhabitants of the wagons (2 persons, however, it seems that for the inhabitants of the wagons this is a top-priority issue).
9. the need for the school to be repaired (1)

This list demonstrates that the difficulty to properly heat houses in the cold season is a main concern in Hayanist. People assume that once they have a gas connection their homes will be warmer; however, they do not consider the involved costs. The costs for a gas connection are high (200-300 USD per household), which a majority of the respondents cannot afford. The monthly gas bills will also be – relatively- high: in the other two project villages it was found that a majority of the households with a gas connection actually not use gas for heating because they cannot pay the bills.

3.11 Poverty and fuel consumption

Above one third of the respondents' households in Hayanist appear very poor and the health of these people is most likely affected by poor nutrition. The main causes of poverty are the low incomes (i.e. high unemployment and low pensions and salaries) and the difficult conditions for agricultural production, even for subsistence agriculture. Poverty is aggravated by the costs for health care and heating.

Winters in Armenia can be cold (during the survey in February the day-time temperature stayed below -10° C for several days) and most people use fuel wood for heating their houses. Many families have to save money on items of life necessity (food, items of personal hygiene, etc) in order to buy fuel wood, as well as the other way around (save on heating to buy food). Most respondents spend about 120-250 USD per winter season on fuel (for heating and cooking), depending on how much they can afford. Even though most households heat their houses very restrictively (only one room and just keeping the cold out), the fuel wood they buy is often not enough. Therefore, they try to diversify their fuel consumption with cheaper or freely available materials such as dried manure, wood from own orchard, wood chips from a furniture enterprise, kerosene or diesel, or burnable solid waste. Several of

[8] Please keep in mind that the respondents were outlining more than one issue at the same time. Furthermore, it is felt that problems already discussed during the interview (such as water and sanitation related problems) are under-reported here.

these “fuels” are of a low quality and. Produce indoor pollution. As mentioned before, four respondents burn even plastic in their stoves indoors. In summer, some families prepare food on a wood fire in their yards to save on bottled gas.

Heating is not only a problem for private households but also for government buildings such as the school, the mayor’s office and the medical centre. The heating situation in the school is most poignant: the classrooms are heated by makeshift stoves working on kerosene or diesel producing black deposits on the ceilings and walls by the halve-combustion process, as well as a bad smell. It can be assumed that the pollution caused by this heating system will also affect the health of the children and teachers. At the same time, the stoves cannot sufficiently heat the classrooms and the pupils have to keep on their coats during the lessons. Recently an accident occurred with one of the stoves –a small fire broke out-, and the school director is making greater efforts to replace the current stoves by safer heating (e.g. electrical). Box 3.3 provides more information about the school of Hayanist.

Box 3.5. The school

The school is situated in the central part of Hayanist. At the time of the survey the school had 374 pupils (194 boys and 180 girls) of 6.5 –17 years of age. There are 2 forms in all grades, except in the 5th and 10th grades. There are 25 teachers and 3 administration personnel working in the school.

The school building is in a very bad condition. The building is very poorly heated in winter and is regularly flooded during spring by water from the overflowing drainage channel next to the school. Repair and reconstruction of the school is urgently needed. The school needs also money for furniture, school books and other materials. There are parents committees in every class that help to clean and repair the classrooms to a certain extent. The school council that decides on the financial issues of the school asks parents for additional contributions. However, these efforts are not able to structurally redress the state of the building, nor can the paintings made by the pupils, which are decorating the corridor, hide the dilapidated state of the school.

The school canteen, which functioned in Soviet times, has been closed and pupils bring their lunch from home. The director would like to reopen the canteen.

During the Soviet times the school had flush toilets inside the building for teachers and pupils. Presently only one flush toilet is still working, which is now meant only for the teachers, and the pupils have to use outdoor pit-latrines. These are located in a corner of a school yard, close to a drainage channel, and the sewage nearly directly enters the drain. These latrines are in a very poor state, they smell and are dirty.

There are two fountains with drinking water in the yard of the school (source or quality?) but there is no opportunity (such as basins) for washing hands.

Many school graduates try to get enrolled into higher education (colleges and universities). More girls apply than boys (app. 20% more). Those who are not admitted the same year of the school graduation, try one or two years later. Higher education is for free only for the poorest and for handicapped young people. Boys who graduated in Hayanist often apply to the Military Academy as the education there is for free. Currently there are 6 recent graduates from Hayanist studying in the Military Academy.

3.12 Conclusions

1. Poverty is the major problem for the majority of the Hayanist population. The main causes are the high unemployment rate, low pensions and salaries, unfavourable conditions for agriculture, costs of health services and need for relatively high expenditure on heating. Many people do not have enough money for essentials such as food, heating, items of personal hygiene, clothing and/or medicines.

2. Many inhabitants of Hayanist cannot afford to visit a doctor or buy medicines when necessary because the national health care service is only for free for certain (vulnerable) groups and most

people have to pay for doctors and medicines. There are many people with health problems who do not receive any treatment.

3. The majority of the inhabitants of Hayanist do not have access to safe drinking water. The quality of the water of the artesian wells is not controlled, the wells are not protected, and the water is not treated. Although half of the respondents were not satisfied with the quality of the drinking water, only few boil the water for drinking purposes.

4. The state of sanitation in the village is very low. Most households and the school have latrines with shallow pits. Most pits are not sealed and therefore these latrines form a source of ground water pollution. A minority of households have flush toilets, the sewage of which flows directly into the open drainage system of the village. Drains regularly overflow and polluted drainage water thus floods streets, yards and houses. In the absence of a proper irrigation system, drainage water is used for irrigating gardens and fields.

5. There is not much agriculture at a commercial scale in Hayanist due to the poor soil properties, high groundwater levels, lack of proper irrigation, and lack of agricultural knowledge among the current population (urban refugees) of Hayanist. Over two thirds of the households try to have at least some crop production in their gardens and/or fields but not all succeed.

6. More than half of all respondents of Hayanist use pesticides, including very hazardous and obsolete pesticides. The selling, storage and handling of the pesticides is not sufficiently safe. Lack of awareness on proper storage and application leads to both accidental and non-accidental intoxications.

7. There is no garbage collection system in Hayanist. There is an authorised landfill which does not meet the proper requirements. Because of the distance, this landfill is not much used to dump waste; people rather burn their solid waste or to throw it at unauthorised places closer to their homes.

8. Burning plastic waste outdoor is common in Hayanist; a few households also burn plastic in stoves indoors, partly because they lack awareness on the health effects and partly out of poverty (instead of buying fuel wood).

9. Many households involved in crop production use (some) synthetic fertilizers; some even as much as 250-500 kg/ha of nitrogen. Use of manure, if available and not used as fuel, is common; the use of (composted) garden or crop waste for improving the soil is not.

10. A few households derive (part of) their income from agricultural activities. Many respondents considered the absence of proper irrigation as a main constraint for profitable agriculture. If irrigation water would be available, they would like to grow wheat. But it is questionable whether the additional profits on wheat would allow for the costs of irrigation.

11. Respondents considered the heating of their houses as a great concern because of the costs involved. Presently many households only heat one room in winter, also using freely available and/or low-quality fuel materials, including manure and waste, some of which causing pollution. Many see gasification as a solution, but are not sufficiently aware of the costs involved. The classrooms of the school of Hayanist are heated by kerosene stoves causing severe indoor pollution due to the process of half-combustion. In addition, these stoves are unsafe.

12. The level of public participation, especially among the women-respondents is low. Traditionally women tend to hand the responsibility for decision-making into men’s hands. Nevertheless, 3 of the 7 elected members of the village council in Hayanist are women.

3.13 Recommendations

1. It is recommended to raise more awareness among the inhabitants of Hayanist about the relationship between environment, hygiene, sanitation and human health. Information should be provided on the actual drinking water situation, proper (e.g. ecological) sanitation, organic or low external input agriculture and the impact of indoor pollution on the (especially children’s) health and development

2. Special attention should be paid to pesticides, with the ultimate aim to discontinue its use altogether. At least the use of pesticides should be reduced, the more hazardous ones should be replaced by less hazardous pesticides and safe storage and handling should be promoted, including the use of protective clothing. Overall, information about the effects on health and the environment is required.

3. Options for the improvement of agricultural production, also as a means to decrease poverty, should be investigated and promoted. It is recommended to invite a soil specialist who can advise on how to improve soil properties and reduce salinity and/or an expert on organic and low external input agriculture who, among others, can elaborate a list of suitable crops for this region, develop rotation plans and provide information on how to avoid the use of pesticide. At a short term, climatic data (such as on rainfall) and information on soil characteristics need to be collected. If insufficient data are available, soil tests may be needed.

4. Because the high groundwater level restricts agricultural activities and causes damage to buildings, geo-morphological and geo-hydrological data about this specific area needs to be collected in order to find out whether and how drainage improvements are possible.

5. The quality of drinking water from all 17 deep wells needs to be monitored and plans for protection of wells need to be developed and implemented. Such plans could include agreements with households about where they keep animals and store manure. If the analyses of water samples indicate microbiological pollution, people should be advised to boil water before consumption, at least for small children. Old pipes that connect households should be renovated where necessary.

6. The construction of eco-sanitation for the school is highly recommended; the school director is already very interested in having such toilets.

7. Considering the problem of intestinal parasites especially among the children in Hayanist, it is recommended to conduct faecal analyses for parasites for all pupils of the school, also in order to predict the storage time of the faecal materials in the composting chambers of the future ecosan toilets. The infected children should be provided with appropriate treatment.

8. In order to reduce groundwater pollution, ecosan toilets should also be promoted in private households. At least the inhabitants should be advised and supported to seal the pits of their latrines in order to avoid contact of the groundwater with the faecal material. Also the problems concerning the drainage channels within the village should be addressed, such as the faecal pollution of the drainage water, the overflowing and flooding of streets, yards and houses, and the irregular and insufficient cleaning of the channels. Sustainable solutions should be identified and tested.

9. A more environmentally sound and affordable alternative for the heating of the school is required. The search for alternatives should be also based on a cost-benefit analysis.

10. It is recommended to investigate options for protecting and reinforcing the landfill at the outskirts of Hayanist and for introducing a garbage collection system. It would be nice –if possible- to start a collection system separating waste in order to minimize waste flows and increase recycling.

11. It is recommended to try to involve as much as possible local inhabitants into social and community activities, especially more women and young people, and involve them more into the decision making and problem solving processes within the village.

4. FINDINGS FANTAN

4.1 The village of Fantan

Fantan is a small and rather isolated village situated at 1800 m altitude at the northern foothills of the mountain of Gutansar (2299.6 m) in a very picturesque landscape. Fantan belongs to the district of Charencavan of Kotayk marz (province). Fantan has a direct bus connection to Charencavan (population app. 20,000 inhabitants) three times per day at a distance of about 6 km. The distance from Fantan to Yerevan is about 30 km; there is no direct connection by public transport.

Fantan has a population of 1117 inhabitants (data from 2001), with a slight majority of women. There are 340 families who live in 240 private houses. There are no minority groups in Fantan; approximately 60 households are Armenian refugees from Azerbaijan.

Fantan's inhabitants live mainly in one- or two- storey stone private houses which, at a first glance, look quite spacious and pleasant from outside. When entering, however, almost all houses give a much more run-down picture, lacking maintenance and with worn-out furniture. Armenian informants in Yerevan, who had been in this village during the Soviet times (but not afterwards), commented that Fantan is a relatively rich village. However, this was the situation from the past and now the situation is different.

30 to 40% of the households are connected to the centralised gas supply system. Some of the households have telephones. During the Soviet times about 50 households were connected to a centralised (irrigation) water supply system. The water was used both for drinking and irrigation purposes. Currently the system is in a bad condition and does not function anymore.

The village has a mayor's office, a small health care centre with one medical assistant and a school. The mayor's office is situated in the centre of the village. Across the street are the "ruins" of the previous Club (a community centre), which was destroyed during the earthquake in 1988. It was originally planned to have this building rebuild, which, however, after the collapse of the Soviet Union, never happened. The school is located next to the collapsed club and currently 172 pupils between 6 and 17 years old attend the school.

4.2 Characteristics of the respondents and their households

In total 11 "long" interviews and 20 "short" interviews were conducted with the inhabitants of Fantan. In addition, interviews were held with resource persons such as the mayor of Fantan, the secretary of the mayor's office, the school director and the medical assistant from the health care centre. Of the 11 long interviews, in 6 women were the main respondent, in 3 men, and in 2 husband and wife together. Out of the 11 respondents:

- four represented families with parents and children (nuclear families),
- two pensioned couples whose grown-up children live separately, and
- seven represented extended families (with three and sometimes even 4 generations living under the same roof).

Families with 3 or 4 children are quite common in Fantan; three young couples had only one child. One of the interviewed women had 7 children.

The age of the respondents of the long interviews varied from 25 to 66 years of age. Most respondents had a secondary education, except two, who are working as teachers in secondary schools in Fantan and Charencavan, respectively. The school director estimated that at present only about 5 percent of the students completing secondary school in Fantan continue with some form of higher education.

4.3 Work, Incomes and Expenditure

Employment and Incomes

Most young people stay in the village after they have completed the secondary school as they can neither afford to pay for further education nor find a job elsewhere. In Fantan there are almost no employment opportunities. The only employers in the village are the school (with 19 teachers, but most of them are from outside Fantan), the health centre (1 medical assistant) and the mayor's office (4 employees). The Mayor of Fantan informed that about 30-40 persons (mainly men) go to Charencavan to work but wages are very low: approximately 1000 dram/day (0.20 USD/day). Daily wages may be higher in Yerevan but people usually do not look for work there as there is no direct public transport connection with Yerevan. A rough calculation, based on information provided by the mayor and few respondents, shows that only 12% of the population of working age of Fantan has a job. For a majority of the families the pensions of the older members of the families are the only source of income. Most pensions are very low: between 6000 and 10,000 dram/month. One of the respondents commented that his pension *"is not enough even for cigarettes"*. Some inhabitants, for example disabled people and mothers of babies, receive a subsidy from the government. These subsidies are low with 3000 dram/month per child or 4000 – 5000 dram/month for a disabled person.

For the interviewed 11 households, the monthly regular income from wages, pensions and subsidies varied from 0 to 27,000 dram per household, or between 0 and 15 USD per person per month. Most of the households try to generate some additional income through casual labour or selling own produce such as diary products, hay or wheat.

Almost all households of Fantan are involved in some form of agriculture or livestock keeping, but no-one considers him or herself as a (fulltime) farmer by profession, because it is difficult to generate sufficient living from farming, see also section 4.6. However, for many households in Fantan agriculture makes it is easier to cope, in particular for households keeping one or more cows, which are seen as an important income generator. One woman said: *"We live because we have a cow"*. Women prepare diary products and sell them weekly at the market in Charencavan. Women often carry more than 2 bags and walk to the market in order to save on transportation costs.

Some inhabitants of Fantan work in Russia, mainly in the construction sector. Most are engaged in illegal work, but have to resort to this kind of work because they do not have other options. One respondent told that her husband used to work in Russia for several years, but the money he had saved was quickly spent when he got a serious health problem with his back, and now is unable to continue working.

Expenditure

Most expenditure is on food and utilities. According to the mayor of Fantan, about 40% of the households of this village are so poor that they cannot pay for any utilities. The response of the survey demonstrates that only for electricity and gas bills households have to pay between 4000 to 10,000 dram/month. Other common non-food expenses are telephone (200 – 1000 dram/month), water (1200 dram/month) (before the good water source was cut off), land tax (in a range of 3,800 – 8,700 drams/ha per year) and -if they have any money left- on medicines. Only a few households can afford to buy clothes. This mainly happens once a year after selling hay or wheat. Some respondents told that they do not have sufficient money to pay for fuel for heating, such as gas or wood; therefore, they use "free" alternatives as much as possible.

4.4 Gender roles

Gender roles in families of Fantan are rather similar to those in Hayanist. However, in Fantan more men are involved in agricultural activities (work on land and livestock keeping). The women are firstly responsible for child care and housekeeping (cleaning house and yard, cooking, baking bread, preparing and selling dairy products etc). Fetching the water is mainly a task of women and/or children. It is more common for men than for women to search for work, especially outside the village

(Charencavan or Russia). Women feel responsible for house and family, and all women-respondents described themselves as housekeepers, and not as unemployed. Those (few) women in Fantan who are employed, are mostly working as teachers. The school director is also a woman, as are the bookkeeper and the secretary of the mayor's office. The mayor and the elected village council members are men.

4.5 Community Participation and Social Networking

There are hardly any organised community activities in Fantan. As mentioned, the former Club building was destroyed during the earthquake in 1988 and never rebuilt. There is neither an official parents committee for the school, although some parents help to solve certain problems in the school at an ad hoc basis. The director of the school, however, would be interested in a greater parents' contribution.

Informally people are more active at community level. Fantan is a small village where the villagers know each other quite well. Neighbours help each other and there is some support to the most deprived families. During the interviews in Fantan, however, it was less common to see neighbours visiting the houses of the respondents, which is contrary to the experiences in Hayanist.

Some respondents, if they have a problem, ask for support from their mayor, and sometimes they indeed received some help. For example, one responded said that his family received some aid (flour and sunflower oil) in 2003, and another family (together with 9 others) received wheat seeds in 2004. The mayor of the village also can obtain nitrogen fertilizer at subsidized prices for the villagers. However, not all respondents were satisfied and several complained that they are in need, but the mayor or village council does not help them.

When asked about membership of a possible community committee to address village problems (in the context of the TMF project), quite some male respondents expressed their desire to become members to have the possibility to influence decision-making processes. Women respondents rather suggested that their husbands be chosen as a member of such a committee.

4.6 Land and Agriculture

Land Ownership

In the early 1990s, after the collapse of the kolkhoz, the inhabitants of Fantan received the land in private ownership. The Fantan kolkhoz had more land than kolkhozes from other villages; therefore, the land share per household was equal to about 4 ha. Currently households in Fantan have between 1.5 - 5 hectares of land. At that time they did not have to pay for the land but recently a land tax has been introduced at national level, which, by most of the rural population, is considered high (in a range of 3,800 – 8,700 dram/ha per year), in particular in view of the low profitability of agriculture despite the fertile soil (chernozem). Also due to the relative isolation of the village, the possibilities to sell land are rather small. Some households, however, rent their fields to neighbours, for which they get paid mainly in kind (e.g. grains, flour or hay).

Agricultural production

During the Soviet times the kolkhoz of Fantan was mainly involved in livestock and fruit production (orchards), see also Box 4.1. In addition, crops such as vegetables, potatoes, corn, sunflower and flax were cultivated. In those times households grew vegetables in their homestead gardens. Nowadays, the more prosperous households are involved in both livestock keeping and grain cultivation (wheat, barley, rye etc). Eight out of 11 respondents are involved in cultivation grain and/or fodder cultures in their fields. However, almost all of these respondents complained that they cannot cultivate their kitchen gardens and/or orchards because they do not have an access to irrigation water. Many respondents use part of their land for hay production (even if they do not keep any cattle; then they sell) and the other part for grains. The latter, however, is not very profitable because the costs for inputs are high (to hire a tractor to plough and harrow the soil costs 12,000-14,000 dram/ha; a combine

14,000 dram/ha, etc) and the market prices low. A respondent whose household was involved in grain and hay cultivation said that last year's total income from farm sales was 100 USD, which is without deducting his costs for inputs (e.g. tractor, fertilizer, seeds, combine). Respondents complained that they have to borrow money for the necessary inputs, but that they are unable to repay afterwards and therefore their debts are transferred from one year to another.

Box 4.1 The kolkhoz of Fantan

During Soviet times the kolkhoz of Fantan was big and prosperous. It was the main employer for the local inhabitants. Everybody had a job and there was no unemployment in the village. The main activities of the kolkhoz were cattle breeding and, after the construction of the irrigation system, fruit cultivation. The kolkhoz had 1200 cows, 2500 sheep, 450 pigs and 1500 chicken. In addition, fields were cultivated with wheat, flax and fodder crops.

In the 1980s an irrigation system was constructed in Fantan. This system was connected to the irrigation canal in Charencavan which receives water from Lake Sevan, the biggest lake of Armenia. With irrigation it became possible to grow vegetables and other crops such as potatoes, eggplants, sunflowers, etc. The kolkhoz had sufficient mechanical equipment, such as tractors and combines.

The irrigation system existed only for several years. After the collapse of the Soviet Union the kolkhoz was dissolved and the land was divided among the villagers, but the irrigation system was left without an owner. In the early 1990s, due to the energy crisis, electricity was permanently cut off for 22-23 hours per day and irrigation was no longer possible, the irrigation pumps were stolen and the system fell into disrepair.

After the irrigation system of Fantan collapsed, many fruit trees died and vegetable production was no longer possible, not even in homesteads. Almost all households had several orchard trees such as apple, plum, walnut and cherry in their homestead. If trees still produce now, the production is very low and is used for own consumption only or to exchange for other food products. Grain yields depend on the weather conditions. If there is enough rain throughout the growing season, the harvest of wheat can be 2 tons/ha; if there is not sufficient rain, there is sometimes no yield at all. Many respondents complained that they lack money for seeds and other inputs, and therefore have to leave part of their land fallow (between 50% p to 70% was mentioned).

Use of chemical fertilizers and pesticides

During the Soviet times the kolkhoz of Fantan used lots of chemical fertilizers and pesticides. Amounts of up to 400 kg/ha fertilizer were mentioned. As in those days the grain yields were big, the majority of the respondents assume that the use of nitrogen fertilizers is a main precondition to get a good harvest. Currently the use of fertilisers is significantly less.

In total 31 respondents were questioned about the use of chemical fertilizers. Three respondents were not involved in agricultural activities anymore. Of the 28 who do some kind of agriculture, only 6 respondents (20%) use nitrogen fertilizers, in particular, for wheat. The amount of fertilizers used is about 100-200 kg/ha. The reason that the other respondents do not use chemical fertilizers is mainly lack of money. Manure, however, is mainly used for heating.

Mice are considered as the main pest in Fantan affecting grain yields. During the Soviet times, pesticides against mice and other pests were often applied, and even were sprayed from airplanes. Also other pesticides were used both in kolkhoz and households, but nobody could recall their names, except for one respondent who stated that during the Soviet times he used "Granozan" once a year in autumn against fungi. Nowadays pesticides are hardly ever used, mostly because people cannot afford them. Mice still remain the biggest problem but, except for a very small amount of pesticides provided by the mayor, most people cannot undertake something against them.

Six out of 31 survey respondents use some kind of pesticides. Two respondents use chemicals against caterpillars and greenflies (pests of fruit trees) and four respondents use pesticides for wheat protection. None of the respondents remembers a name of the pesticides they used, only the colour (!). This indicates that awareness about pesticides in Fantan is very low. As soon as people have more money, the use of pesticides and mineral fertilizers may increase again.

Livestock

The village of Fantan is situated in the mountains and is surrounded by alpine pastures ("yayla"), and, therefore, is very suitable for keeping cattle. There are over 1000 ha of pastures in community ownership. Although outsiders would like to buy this land, the villagers, together with the mayor, decided not to sell it. All villagers can send their cattle with a shepherd to graze on the pastures during the warm season. The cost of a shepherd is 10 USD/season for a cow and 5 USD/season for a goat. The cows are said not to produce much milk, and a maximum 3 litres of milk per day was mentioned. Part of the pasture is rented out to a well-to-do farmer from outside the village for grazing of his cattle.

About 75% of the respondents have at least one cow in their household. Some households keep goats instead of cows. Very few respondents keep sheep. The richest household of the village keeps a cow and a calf, 20 goats and sheep, and 2 pigs. It is also common to keep some chicken, but households seldom have more than 10 chicken.

4.7 Water Sources, Quality and Uses

Water Quantity and Quality

One of the biggest problems of Fantan is the relatively difficult access to water sources. The village even got the nickname "*Dried Fountain*" because there is no accessible groundwater in this area. During the Soviet times about 50 households were connected to the water system supplying the irrigation water. After the collapse of the Soviet Union the pumps were stolen and the water supply was discontinued.

Two years ago Fantan had a complete central water supply system installed (source?). Only the connections to the households and the water meters were missing. Nobody could satisfactorily explain why the system was not completed and made operational. Possible explanations may be the restructuring (and further privatisation?) of the water sector in Armenia and/or the lack of funds of many families to pay for connections and water meters.

At the time of the survey drinking water was supplied to Fantan at two water-points. The first water-point provides good quality water, but needs pumping and the villagers are required to pay for the electricity costs, which amount to 1200 dram/month per household (i.e. 2.4 USD). As part of the inhabitants of Fantan could not afford to pay this amount, the water company had the pump switched off and this water is no longer available.
The second water-point of the village, the so-called "old" source, is actually a supply of surface water collected from a small mountain spring. The collected water goes through a tunnel, entering a pipe system. There is a kind of filter to avoid that big objects, such as branches or stones, enter into the pipes, but there is no treatment against microbiological pollution. This allows outbreaks of diarrhoea and even more dangerous infectious diseases, like tularaemia in 2003, see also Section 4.9 and Box 4.5. In summer the amount of available water reduces considerably and often there are lines of people waiting to fetch water; half an hour waiting time is common in summer.

Considering that households have to pay for the electricity costs for the water supply at the first water-point, quite some households prefer to use the "old" source, as the water is for free, because this water-point is closer to their homes, and because this supply is never interrupted.

Use of Water

Because all water has to be fetched in containers, the consumption of water in Fantan is comparatively low. Water is used for essential activities such as drinking, cooking, cleaning, laundry and for watering the cattle. A respondent said that their household (9 family members, plus a cow) needs 4 to 5 20-litre cans daily and carrying this water to their home is considered a difficult task. Only one respondent said that members of her household sometimes fetch water for irrigating their homestead garden, using big containers which are carried by hand. Except one, no other houses of respondents have a proper bathroom. Most respondents said to wash themselves in a wash-basin in the building in the yard were they usually bake bread. As it is hard work to carry sufficient water for bathing (5 to 6 20-litre cans are needed per person), some people take a bath only once in two weeks. There are similar water problems with laundry. Even if there is a washing-machine in the house, women often prefer to wash by hands, as washing-machines require more water. In winter women wash laundry in warm water, whereas they use cold water during the summer.

A reason for the high electricity cost for water pumping of the good quality source (if not switched off) is the fact that in winter the water has to flow continuously as otherwise the water will freeze and the pipes will break, even though the amount of water used by Fantan's inhabitants is limited. In winter the temperatures in Fantan are low and can reach - 30º C in certain nights.

Almost all respondents would like to have the drinking water situation improved, preferably by having a house connection, which –in their opinion- will significantly improve their living conditions. If they would have such an in-house connection, they would not only use the water for drinking purposes, but would have a bathroom or a "banya" (Russian sauna) constructed and even would use the water to irrigate their homestead garden and fruit trees. However, the respondents are also afraid that they would not be able to pay for such a water connection.

Water for Irrigation

The absence of irrigation significantly limits agricultural activities in Fantan. In particular, people cannot grow any vegetables in their homesteads. Many respondents recalled with nostalgia the past when they had good harvests of vegetables and fruits from irrigated homestead production. The present grain and hay yields depend largely on the weather conditions and often the cultivation of wheat is unprofitable. Therefore, some villagers just quit any cultivation.

Respondents and resource persons from Fantan mentioned that the rehabilitation of the irrigation system in Fantan is an investment that will benefit almost every household as it will especially enable (homestead) vegetable production again, thus improving people's well-being. The mayor estimated that rehabilitation of the irrigation system for Fantan would cost around 10,000 to 15,000 USD, a sum which is not affordable for the village.

4.8 Sanitation and Waste Disposal

Sanitation

There is no central sewage system in Fantan and most households have pit latrines. Only 2 or 3 households in the whole village have a flush-toilet, connected to a septic tank. Latrine pits are usually not emptied, but when the pit gets full, the pit is covered with a layer of soil and a new pit is dug at another place in the yard. On average, a new pit is dug once in 5 years, but in some households a new hole is dug after every two years. The latrines at the back of the school are meant for the pupils and teachers. However, they were dirty and in an advanced state of dilapidation, see also box 4.2.

In Fantan people complained less about sanitation than in Hayanist and almost none of the respondents spontaneously mentioned to wish a flush toilet. Respondents were mainly concerned about the absence of showers or bathrooms in their households.

Box 4.2 State of sanitation in Fantan school

The school of Fantan is situated in an old three storey building in the central part of the village. The class rooms and hall all are in a very poor state and the school has many problems. One problem is the absence of a proper heating system. The villagers installed a self-made heating system that works on electricity and parents covered last year's electricity bills. With temperatures of up to 15º C it is comparatively "warm" in the school in winter, although pupils tend to catch cold and get sick. The duration of lessons at school is from 9 until 14:00, but when it is very cold, the duration of the lessons is reduced.

As there is no functioning water supply system in Fantan, the school does not have an indoors water connection. The school is situated in the centre of the village, opposite the "new" water source, and it is relatively easy to fetch some water with buckets if the pumps are working. However, there are no proper facilities for hand washing (e.g. near the latrines) nor for the provision of safe drinking water.

The biggest problem of the school is the state of the school toilets. The toilets are pit-latrines situated in the school backyard and they are in a dilapidated state. The toilets are so dirty and smelly that many school pupils rather run home in order to go to the toilet. Those children that live further from school are forced to use the school toilets. Teachers avoid using the school toilet and try to go to private houses with a flush toilet instead. Some teachers do not drink in the morning (even no tea at breakfast) as they do not want to go to the toilet during their work. Construction of new toilets is without doubts a high priority of the Fantan's school.

Solid Waste Disposal

There is no proper solid waste disposal in Fantan. Respondents informed that since soviet times there had been a waste collection service, but these services were discontinued due to lack of money. Now part of the waste is disposed in illegal places like gullies around the village. During the survey an employee of the mayor's office said smiling: *"you do not see the waste now because the land is covered by snow and that's why everything looks so white and nice"*. Apparently there is a unofficial site for dumping waste not far from the village, which is neither reinforced nor fenced, and from where waste is sometimes blown into the streets of the village.

Three-quarters of the respondents dump at least part of their waste at this site. One respondent, however, mentioned, that the village council prohibits dumping waste there, but added that local people including his family continue to do so as there is no alternative. A few respondents said to dump their waste somewhere in the fields or in gullies. It was said that the village council sometimes organises "a cleaning-up of the illegal site": a tractor then shovels the waste into nearby gullies.

Box 4.3: Solid waste disposal in Armenia

Some 12 700 m^3 of domestic waste is produced each day in Armenia, 10,200 m^3 a day in urban areas and 2,500 m^3 in rural areas. To date, the only means of dealing with solid domestic waste has been to transport it to dumps. According to the statistics, Armenia has 54 managed solid waste dumps in use, which are operated by enterprises specializing in municipal waste management. They cover an area of 196.0 hectares. These dumps annually receive some 1.5 million tonnes of domestic waste from the towns and cities and five rural districts. Most dumps in Armenia do not meet health and environmental requirements.

Source: World Health Organization (WHO.) 2001. Highlights on health in Armenia. Electronic version: http://www.euro.who.int/document/e72377.pdf

Most respondents burn part of their solid waste. For example, a poor family said to "*burn everything that can burn*", such as paper, plastic and even old shoes, because they cannot afford to buy wood or other fuel. Another household uses the roof of their old house as fuel. Only one of the 31 respondents said never to burn any solid waste; they dump all at the landfill.

Paper and ***plastic*** are the waste materials which are most often burnt. The reasons for burning plastic can be very different: most respondents burn plastic to save fuel, but one respondent to burn waste including plastic bags to avoid that such waste -if dumped- is blown by the wind into the streets or being eaten by cows. Two thirds of the respondents burn plastic indoors, especially during the winter. One respondent complained about the terrible smell of burnt plastics and said that they could hardly stand it. Over half of the respondents are aware that burning plastic is not good for people's health. However, some of those assume that if the ventilation in the house is good, the health risks are negligible. One respondent saw suffocation as the biggest risk from plastic burning. No respondents mentioned the risks of chemicals such as dioxins. Therefore, although there is some awareness about burning plastic, knowledge about the real risks is insufficient.

Organic Waste and Composting

Because many families in Fantan keep one or more cows, there is quite some manure available in Fantan. 90% of the respondents use manure mainly as fuel. For this purpose the manure is dried and mixed with straw and then it is used as fuel for both heating and cooking. Many respondents are concerned that, because they even have not enough for heating, no manure is left to use as fertilizer. Only in three households (out of 31) manure is sometimes used as fertilizer. Manure is collected during the winter on a heap and is applied on the land during the following autumn. In summer, the cattle goes to the pastures and normally no manure is then collected, except for one respondent, who mentioned that her family members go to the pastures to gather the manure.

Garden or crop waste, in as far as available, is not considered as something useful. Almost half of the respondents burns garden waste in autumn A few respondents dump garden waste at the landfill and a few others do nothing with it (e.g. leave it on the land and plough it into the soil in spring). Only 3 respondents occasionally compost some of their garden waste.

4.9 Health, Diet and Hygiene

The meetings with inhabitants during the survey gave the impression that many people in Fantan are not in good health. Most villagers cannot afford a visit to a doctor. Many respondents mentioned that if they would have more money, they would use it first of all to try to improve their health. Some inhabitants need an operation or treatment in hospital but they forego this because they do not have a possibility to pay for it. One respondent mentioned that his brother, who currently lives in Russia, provided his family with 200 USD for the treatment of the eyes of the respondent's son.

The children in Fantan are often affected by respiratory diseases: cold, flue and pneumonia are quite common, especially in cold seasons. Respiratory diseases are caused or aggravated by low living standards (poor nutrition, insufficient heating, etc.). Because of similar reasons a considerable part of the adult population has arthritis.

Box 4.4: Medical centre of Fantan

The medical centre of Fantan is situated close to the centre of the village. The building is very small and consists of a corridor and two small rooms. Because the roof above one of the rooms is leaking, this room is not in use. The other room is decorated by faded posters about vaccination and the importance of breast-feeding. There are a few outdated booklets (published in 1970s-1980s) on the shelves.

One medical assistant works in this centre. She complained that the centre lacks necessary equipment and medicines. The Ministry of Health sometimes supplies the centre with vaccinations for children. It seems that the health centre can provide little first aid in case of an emergency and the centre is almost always closed. The villagers know where the medical assistant lives and, if necessary, they contact her directly. The medical centre does not provide villagers with medicines. They can buy them only in the drug-stores in Charencavan or in Yerevan.

Outbreaks of intestinal and other infectious diseases appear quite common in Fantan. For example, in 2003 an outbreak of tularaemia, also known as "rabbit fever", took place, see also box 4.4. During this outbreak 157 cases were registered in Fantan and sometimes people were sick for 2 months or longer. In some households almost all members were affected, including pregnant women. Respondents mentioned that in that case of tularaemia they received free health care from the government, due to the risks involved in this infectious disease. It is alleged that the cause of tularaemia was the water from the "old source" and the story goes that an infected rat fell into the water supply tunnel.

Box 4.5: Tularaemia

Tularaemia, also known as "rabbit fever", is a disease caused by the bacterium *Francisella tularensis*. Tularaemia is typically found in animals, especially rodents, rabbits, and hares. Typically, people become infected through the bite of infected insects (ticks and deerflies), by handling infected sick or dead animals, by eating or drinking contaminated food or water, or by inhaling airborne bacteria. People have not been observed to transmit the infection to others, so infected persons do not need to be isolated.

If the bacteria are airborne and can be inhaled, *Francisella tularensis* is highly infectious because a small number of bacteria (10-50 organisms) can cause the disease. The bacteria can remain alive for weeks in water and soil. The incubation period for tularaemia is typically 3 to 5 days, but can range from 1 to 14 days.

The signs and symptoms people develop depend on how they are exposed to tularaemia. Possible symptoms include skin ulcers, swollen and painful lymph glands, inflamed eyes, sore throat, mouth sores, diarrhoea or pneumonia. People with pneumonia can develop chest pain, difficulty breathing, bloody sputum, and respiratory failure. Tularaemia can be fatal if the person is not treated with appropriate antibiotics.

Source: Department of Health and Human Services. Centres for Disease Control and Prevention. 2003.Frequently Asked Questions About Tularemia. URL: http://www.bt.cdc.gov/agent/tularemia/faq.asp

Many respondents think that drinking water does not pose a risk to their health. They rather link the outbreaks of intestinal diseases with the quality of food, not with the quality of drinking water. Most of them do not boil water before drinking. Only a few respondents mentioned that they boil water before drinking in spring, when they can visually identify that it is polluted. However, the outbreaks of diarrhoea mainly take place during the summer.

Only a few respondents think that the type and state of their toilets might influence their health, in particular the health of their children. However, these villagers do not consider improving the type and condition of their sanitation because it is unaffordable for them.

Awareness about personal hygiene seems rather low in Fantan. But even if people are aware about measures of personal hygiene, not everybody follows them due to different reasons: they just forget, do not have the items of personal hygiene (such as soap) or do not have access to water. The majority of the respondents from Fantan mentioned that they wash their hands mainly after working with manure and/or cattle. One-third of the respondents answered that they wash their hands before eating and only few answered that they wash their hands after visits to a toilet. It is rather complicated to identify whether the remaining respondents are aware about personal hygiene, as their replies about washing hands were vague. One respondent replied *"we already have so much work to do that we do not have time for washing our hands"*.

The variety of food intake of the inhabitants of Fantan is very limited. Households mainly depend on food produced by their household, which they occasionally exchange for other products. A respondent from a very poor family said that they can afford to buy only flour and some oil whereas all milk from their only cow is sold in order to have at least some income. Not even the children from this family drink milk. Their daily meals consists of lavash (Armenian bread) and sour cabbage - this family even cannot afford to buy potatoes.

Families that are slightly better-off eat bread, potatoes and dairy products on regular basis. Fresh vegetables and fruits are bought by few households during the harvest seasons. Few households have some fruit trees in their yards, but yields are low and spoiled by pests. The little fruits they harvest, they exchange for potatoes, sugar, onions etc. Some families still manage to make jams and some preserved vegetables for winter mostly buying the ingredients, while poorer households cannot afford it. The consumption of meat and eggs is very limited. Most respondents stated that they eat eggs once a month, while *"meat is only for big holidays"*.

4.10 Main problems of Fantan as perceived by the respondents

According to the mayor of Fantan the main problem of the village is the lack of access to (safe) drinking water and to irrigation water. The same issues were identified by half of the respondents as priority problems, as demonstrated by this list of main problems, with the most often mentioned problems first:

- To have irrigation water and improved access to (safe) drinking water (almost all respondents)
- To have a kindergarten in Fantan
- To have a village club for older children and young people
- To repair the roads and to put asphalt
- To provide young people with employment opportunities
- To repair the school building

A woman respondent was asked why she thought that a kindergarten is necessary in the village when nearly all mothers are housewives and thus can take care of the young children. The respondent replied: *"Our children lack social activities and communication when they just stay at home and do not attend a kindergarten. Moreover, there are many talented children here and they have to develop their talents"*. As an example, she said that some children of Fantan had had a chance to sing on Armenian television in a kind of children's contest. They could sing very well at home, but became very shy in front of the cameras and did not know how to behave. Therefore, more exposure is considered necessary. The need for a village club is explained in a similar way: a village club is a possibility to communicate with each other and to be involved in social activities for teenagers and young people.

4.11 Conclusions

1. Poverty is the major problem for Fantan, and a majority of the households live under the poverty line of 2 USD per person per day. The main causes of poverty in Fantan are the high unemployment rate and lack of employment opportunities, low pensions, unfavourable conditions for practicing agriculture, and, to some extent, the relative isolation of the village. People do not have enough money to pay for essentials, such as food, heating or items of personal hygiene.
2. The villagers of Fantan, like those from Hayanist, have restricted access to health care services because health care is not free, and people often cannot afford to pay for a visit to a doctor or for prescribed medicines. People's health is also affected by poor nutrition, lacking protein rich food as well as fresh vegetables and fruits.
3. At the time of the survey there was no access to safe drinking water. There are two sources of drinking water in Fantan. One source provides safe water from outside the village, but its supply was discontinued because people did not pay the service costs (i. e. the electricity costs for pumping). The second source is an old spring with free surface water, supplying water of a poor quality, occasionally causing outbreaks of infectious diseases, while its quantity is restricted in summer time. A few years ago a new central water supply system was installed, but for unclear reasons (financial?) the house connections and water meters were never installed and the system was never put into operation.
4. The awareness of the villagers about safe drinking water and its influence on human health is low. Despite regular outbreaks of water related infectious diseases (diarrhoea, tularaemia etc) most inhabitants of Fantan never boil the water before drinking, however, the extra costs for boiling are an additional reason. It appears that awareness about personal hygiene is also relatively low.
5. The collapse of Fantan's irrigation system and the kolkhoz in the early 1990s tremendously increased the poverty in the village, which -in Soviet times- was a prosperous one. People who were before employed by the kolkhoz became unemployed. The absence of irrigation water made that villagers can hardly grow any vegetables anymore and it severely affected fruit cultivation as well as the production of field crops, in particular in relatively dry years. At present there is still grain and hay cultivation (for flour and fodder, respectively), but harvests highly depend on the weather and are often low. Even though the soil around Fantan is fertile, agriculture under the present conditions is considered as little or un-profitable and sometimes even cause families to take more and more debts. The use of agrochemicals and fertilizer is low because most families cannot afford to buy such inputs.
6. Burning of plastic inside houses is quite common. Due to both lack of awareness and poverty many inhabitants of Fantan use plastic as a fuel for their stoves or heaters. Some respondents are aware that burning plastic pose a risk to human health, but circumstances force them to continue to burn plastic (and other waste). Moreover, there is no proper solid waste collection.
7. Due to poverty people cannot afford sufficient fuel for heating during the cold season. Although 40% of the village has a gas connection, many people do not use gas for heating as it is too expensive. The main fuel for heating in Fantan is dried cow manure and burnable waste, and sometimes wood from own orchard trees. The poorly heated houses are considered to contribute to the high incidence of respiratory diseases and arthritis in Fantan.
8. The building of the school of Fantan is in a very poor condition. Worst are the school's toilets which are pit latrines in a very dilapidated state needing immediate attention. The director of the school recognises this.

4.12 Recommendations

1. The rehabilitation of the irrigation system of Fantan will bring benefits to almost every household in the village. It will allow people to restart homestead vegetable production and their diets and financial situation will improve. Therefore, it is recommended to investigate the technical options for rehabilitation. Such a "feasibility study" should also include an economical analysis to find

out whether irrigation water will be affordable for the users, and whether the additional expenses for irrigation will not exceed its benefits.

2. There is an urgent need to construct new toilets for the school of Fantan. The director of the school is fully supporting the idea of ecosan toilets. Therefore, it is recommended to start the planning procedures as soon as possible, which should include obtaining the required authorization as well as conducting an awareness campaign about the advantages and proper use and maintenance of ecosan toilets, including the use of the resulting products (urine and composted faecal materials).
3. It is not clear whether many pupils of Fantan's school have intestinal parasites, but it is recommended to conduct faecal analyses for parasites and provide appropriate treatment for the infected children. Information about the incidence of parasites will help to establish the optimal storage time of faecal materials in the composting chambers and in such a way reduce the risk of application of not fully treated compost material on the fields.
4. The supply of safe drinking water should get a high priority. For the moment the water from the "good" source should be supplied again, at least for drinking purposes. If the problem continues that people cannot afford to pay the required water fees, AWHHE should find out what the rules are and what is in the contract with the water company with respect to provision of water to low income households. At the same time it is suggested to investigate whether the central supply system which was installed two years ago, can be completed with house connections and water meters. It should be stressed that low income households should be able to use at least small amounts of safe water for consumption purposes at rates they can afford. If one of the two above options cannot be realized at the short term, it should be investigated if the quality of the "old" source can be improved and/or people should be advised to boil the water before the consumption, at least for babies and children.
5. It is necessary to increase the awareness on burning plastic, in particular for indoor stoves. However, such campaigns will be only successful if (1) alternative and affordable fuel for stoves is available and (2) alternatives for proper waste disposal are developed.
6. It is recommended to find out more about the present site where waste is dumped in Fantan, in particular to find out what the health and environmental risks are and how the site can be improved. It should be investigated how the disposal of waste in gullies and other illegal sites can be stopped or reduced, including whether clearing of illegal dumps can be organised.
7. Because the awareness about the influence of the state of sanitation, hygiene and the quality of drinking water on human health is low in Fantan, it is recommended to start an information campaign on issues such as safe drinking water, eco-sanitation and environmental health. Based on AWHHE's earlier experiences, the most appropriate methods for conveying such information should be identified such as possibly: interactive workshops for adults and children, contests and/or preparation of educational materials, and involving school teachers, the medical assistant and the local authorities.
8. Although at present the use of pesticides is low because most households cannot afford them, it is recommended to raise more awareness about pesticides, its safe use and handling and alternatives for pesticides. This is necessary because as soon as the financial situation of the households of Fantan improve, the use of pesticides and chemical fertilizers is likely to increase as well.
9. When establishing a community committee in Fantan for the project, especially women and young people should (also) be encouraged

5. FINDINGS DZORAHBYUR

5.1 The village of Dzorahbyur

The village of Dzorahbyur, in translation from Armenian “the canyon of springs”, is located at 14 km from Yerevan. Dzorahbyur belongs to Kotayk marz and its number of inhabitants is estimated at 2026 (1022 men and 1004 women), and the number of households at about 700 (excluding dachas). The population of Dzorahbyur is relatively young, with about 50-100 local inhabitants receiving pensions according to a village council member. There are no minority groups in Dzorahbyur, and only 4 families of refugees from the Armenian-Azerbaijan conflict.

Many Armenian people associate Dzoraghbyur with a beautiful and rich village as since the last years of the Soviet Union rich inhabitants of Yerevan have been constructing their summer houses (“dachas”) here. Nowadays the construction of dachas continues with the introduction of the land tax (and poverty) as reasons. This tax (in a range of 2340-9570 dram/ha per year depending on the category of land and availability of irrigation) makes poor villagers sell their land as they find it difficult to raise the money to pay the tax. As a result, many houses in Dzoraghbyur are empty most of the year because these houses are “dachas” and are only used during the (summer) holidays.

Dzoraghbyur indeed looks like the richest villages from all three project villages, but, objectively speaking, most of its population is also poor. The village has electricity, a central gas supply system (“gasification”) and local water supply systems. The village council allocates some small subsidies for the poorest households for example for paying for drinking water and/or for school books.

The school in Dzoraghpryur is attended by 400 pupils of the age from 6 up to 16-17 years old. The old school was renovated 3 years ago, and also got a centralised gas heating system (only 3 schools in the Kotayk province have this kind of heating). The costs for renovation came from a special state programme, which included UN funds. There is no kindergarten in Dzoraghbyur; but in the neighbouring village there is. Parents could send their children there, however, this is not very convenient.

5.2 Characteristics of the respondents and their households

In total 20 “in-depth” or “long” interviews were conducted with inhabitants and 18 “short” interviews. Out of the 20 long interviews about personal living conditions, 11 had a woman as the main respondent, 6 a man and in 3 interviews both husband and wife responded. Also interviews with resource persons were held, such as with several village council members, the director of the school and the therapist (general practitioner) were conducted.

Four-fifths of the respondents have secondary or professional education and one-fifth higher education. The children of two respondents currently study at a university, whereas the children of another two respondents already had their university degrees but cannot find a job.

Well over half of the respondents represented households with family members of 3 (or even 4) generations (so-called extended families). About one-third of the respondents represented nuclear families of parents with children (aged between 3 to 30 years). Two households consisted of a couple of pensioners who lived separately from their (adult) children. The household size varied from 2 to 10 family members, with an average of 6 members. Most interviews were conducted in the presence of other family members.

5.3 Work, Incomes and Expenditure

Employment

The employment situation in Dzoraghbyur is relatively better than in the other two project villages. Still there is much unemployment and people kept referring to the Soviet times when the employment

situation was so much better with work for everyone. During those days there was, next to the kolkhoz, a military plant close to Dzoraghbyur and many inhabitants of the village received a technical education and worked there. The plant was closed in 1993 leaving few employment opportunities. Currently there is a small plant for fruit and vegetable preservation with approximately 20 employees (only operated seasonally), a big private diary farm with about 12 employees, the mayor's office, the health care centre and the school. Some inhabitants of Dzoraghbyur look for and sometimes find employment in Yerevan or are involved in small private business. For example, a single woman (living with her daughter) produces glassware, and another woman works at home as a dressmaker. There is relatively less (labour) migration among Dzoraghbyur families because of the opportunities to get seasonal work in the village (e.g. in the construction of summer houses) and because daily commuting is possible if work in Yerevan is found.

Out of the 20 interviewed households only one has its only income from the pension of an elderly family member. There are three other households where all members are all unemployed; they try to earn some money from agricultural or livestock production. The other 16 households have income from permanent and/or seasonal employment.

Incomes

The incomes of the respondents households varied greatly. The lowest monthly income (i.e. salary and/or pensions and/or subsidies) per person is 2500 dram (5 USD); the highest 32,500 dram (65 USD).The table below represents the income distribution among 18 respondents who gave information about their households income, including any sales of agricultural produce.

TABLE 5.1: COMPARATIVE INCOMES OF THE RESPONDENTS (?) OF DZORAGHBYUR

		Income per person per month (dram/ USD)	Number of the households
1	☹	Less than 10,000 dram (20 USD)	10
2	☹	10,000 – 20,000 dram/ (20 - 40 USD)	5
3	☹	20,000 – 30,000 (40 - 60 USD)	1
4	☺	Above 30 000 dram (60 USD)	2

These results demonstrate that 16 out of 18 respondents are living under the poverty line[9].

Expenditure

The main expenditure for the respondents of Dzoraghbyur are food, fuel, electricity, water and clothes:

- Almost all respondents said that their household spends 50% or more of the total income on food, the few remaining households around one-third of the total income. Comparatively richer households spent a smaller part of their income on food.
- The second highest expenditure is on fuel (gas, bottled gas and wood). The expenditures on gas are comparatively low (1500 – 5000 dram/month) in summer, but increasing to 5,000 – 50,000 dram/month in winter. The wealthiest households pay the highest bills for gas, while the poorer try to save on heating. According to a village council member, a household could easily spend 90,000 drams/month to heat a whole house in winter by gas. However, it is common that only one room of a house is heated and that alternative fuels are used to save on the gas bill. Many respondents therefore use manure or wood from their gardens. Several households even buy wood or woodchips, spending around 15,000-20,000 drams per winter season.
- Electricity costs vary from 1000 to 7000 dram/month, with a comparatively higher consumption during the winter.
- Among the other mentioned expenditures are the costs for drinking water (1000 – 1600 dram/month, based on village council calculations to cover the electricity costs for pumping, and irrigation water (4000 - 5000 dram per month during the growing season per household),

[9] As defined as 2 USD per person per day, see page 2

medicines (2000 – 10,000 drams/month), transportation costs (700 dram/day for travelling to Yerevan), school, costs for agricultural inputs and fodder for cattle.

5.4 Gender roles

When the respondents in Dzoraghbyur were asked about the specific tasks that are mainly done by the men in their households different answers were received. Most common were answers such as: "*earning money to support the family*" and "*agricultural and livestock activities*". Among the other replies were such as: "*all the works, connected with activities outside the house*", "*repairing in the house*", "*cutting wood and maintaining the fire*" and even "*shopping*".
The range of tasks that are mainly done by women in their households was generalized by most of the respondents by one phrase "*housekeeping (and taking care of children)*". One respondent also mentioned as a specific women's task "*milking a cow and making cheese*".

Box 5.1 The thoughts of the director of Dzoraghbyur school about gender issues

According to the director of the school women and men are not equal in Armenia. Men have *per se* more rights due to traditional roles and they think that women's role is at home. It is in particular difficult for husbands to accept if their wives are more successful than they are. But women in Armenia are in general more responsible than men. Women need to have better knowledge and work harder in order to get some position in society. There are less chances for women (e.g. there are only 4 women in Parliament of Armenia), although she sees some progress now.

She observes that the girls in school are more responsible in their studies than boys. Even if boys are more gifted than girls, the girls have better results, as they are more persistent. The director likes to encourage her pupils, and in particularly girls. Other teachers at school do not always support her in this as they are more traditional.

In two-fifths of the households the decisions on money spending are taken mainly by men, in nearly one-third by husband and wife together and in another one-third by mainly women, including sometimes by a mother-in-law. The decisions at village level are taken by the mayor and the village council of 6 members, all of whom are men.

5.5 Community Participation and Social Network

There are not many possibilities for participation in (organized) social activities in the village. During the Soviet times a library and culture club were functioning in the village but they were closed in 1990. There is a church in Dzoraghbyur, but because it needs to be repaired, no mass is held nor is there a priest. Now villagers just come there to light candles and to pray. As soon the church will be repaired, it is expected to start to function normally.

In the school there are parent committees for every class (18) and one committee for the whole school, the latter consisting of the heads of the class parents committees. Parents come every Saturday *"to clean and disinfect"* the classrooms. During the cold seasons the parents committees collect money for the gas bills (for the heating of the school).

Box 5.2: The school of Dzoraghbyur

In 2005 the school of Dzoraghbyur was attended by 400 pupils (182 boys and 218 girls) of 6 to 17 years old (10 forms). According to Armenian legislation school enrolment is obligatory until the 9th form. After the 8th form most pupils continue to attend the school in Dzoraghbyur, however, the director is concerned because most pupils of the higher forms do not do their homework anymore. Upon graduation from the school approximately 70% of the graduates are interested to continue studying. However, only 30% of the school graduates actually enter a state or commercial college or university. The others cannot afford to pay for higher education.

The building of the school is recently renovated. The school got gas heating, so it is nice and warm there. There are flush toilets for men and women, both for pupils and teachers. There is a kind of sewage system, but leading the sewage of the school toilets into a canyon, without any treatment. The school has a nice computer classroom and a good hall with a stage and chairs received as a gift from a movie theatre.

The biggest problem of the school is the low budget, which is decreasing from year to year. The budget is based on the number of pupils attending the school, and less pupils means less money. The birth rates in Dzoraghbyur have been decreasing for a long time and are now at the lowest level of the last 35 years. In 2004 only 15 babies were born. Thus more pupils finish their studies and leave the school than enter the school. Now there are 35 pupils in the first grade, but in 4 years they expect to have much less.

The school budget is spent on only salaries and social taxes, not leaving any funds to pay for the gas bills, which amount to about 400,000 dram/month in winter. Luckily the mayor helped and paid 50% of this sum; the parents help with the remaining amount. The mayor also paid 125,000 drams for school books for 39 pupils from poor families with many children. The school also applies for help to rich people. At the moment it is necessary for the school to update their didactic materials. The school needs maps, laboratorial equipment, furniture, etc. However, compared to the schools of Fantan and Hayanist, this school is quite well off.

Nearly half of the respondents said that they and/or their family members are (or have been) involved in some kind of social activities such as a parents´ committee or attending the church. In one respondent's household, a member belonged to the village council, while another respondent said to be a teacher and therefore *"always actively involved in social activities*".

Two-thirds of the respondents were interested to become a member of a community committee with the aim to discuss and find solutions for problems in the village. One woman said that she is highly interested in becoming such a member but she was afraid that her husband would not allow her. Her explanation was that her husband is very jealous and does not often allow her to go outside the house. Another interested respondent said that due to his seasonal work he, unfortunately, could participate in meetings only in the winter.

One of the respondents complained that the elections of the village council members are not democratic in Dzoraghbyur and that "hidden" agreements were made about who will become a next village council member. This same respondent has also the opinion that the village council is not working for the village, but for their own members' interests. For this reason the respondent really would like to become a member of a community committee. Another respondent, who is a village council member, also expressed his desire to be member of such a committee. Some respondents also suggested candidates for a community committee, such as the former mayor of the village, the secretary of the village council or a present council member. These discussions gave an impression that there is a hidden struggle for power in Dzoraghbyur.

The inhabitants of Dzoraghbyur were also asked who from outside of their household could support them if they were in need:

- Nearly half of the respondents replied that they could ask for help from the mayor

- Nearly one third mentioned their relatives or children,
- About one-sixth replied that they have nobody to ask for help, and
- One-tenth mentioned their neighbours.

5.6 Land and Agriculture

Land Ownership

During the Soviet times the land in Dzoraghbyur, as everywhere in Armenia, belonged to the local kolkhoz. In the early 1990s –based on a decision of the new national government- the land was divided among the inhabitants of the villages. The shares in Dzoraghbyur were equal to 0,5-0,6 ha per person plus an additional 0,1 ha as homestead. At present, as mentioned before, villagers tend to sell land, because they cannot afford to pay the land tax, whereas there are enough city residents who are willing to pay an attractive price for land to construct a dacha. Currently there are no large landowners in Dzoraghbyur and the maximum amount of land owned by one farmer is 5 ha. There is also a private farm, whose owner somehow took over the kolkhoz farm, with 400 cows but no pasture land, thus they have to buy all the fodder. Most communal pastures of the village were sold for the construction of dachas, leaving the villagers hardly any place to let their cattle graze.

Agricultural production

During the Soviet time the kolkhoz of Dzoraghbyur primarily produced fruits. Much land was covered by orchards and harvests were high. In the early 1990s the irrigation system stopped functioning due to the energy crisis of that time and consequently many trees died and/or were chopped for fuel.

Out of the three project villages Dzoraghbyur has most agricultural activities. The soils are fertile and most households have fields for grain cultivation, hayfields and homestead gardens and/or orchards. Households that have access to irrigation water cultivate vegetables in their homestead gardens, such as tomatoes, beans, cucumbers, cabbage, paprika, and sometimes potatoes. Fruit trees at the homestead include apples, cherries, plums, walnuts, apricots, and/or bushes of raspberries and hazelnuts. Homestead production is mainly used for own consumption and often also for preservation. Households that derive some agricultural income, mostly get this from grain cultivation, in particularly from wheat, although one respondent stated that barley is more profitable. To underpin this, he explained that last year (2004) he harvested 500 kg/ha of wheat and 900 kg/ha of barley. However, both yields can be considered as low.

One-fourth of the respondents in the survey had completely given up cultivating their fields and about one-third kept part of their land fallow (from 35% up to 50% of the land). The main reasons for not cultivating land are the absence of irrigation and/or the high prices for required inputs. As an example a respondent mentioned that hiring a tractor for ploughing costs 8000 dram/ha, harrowing 4000 dram/ha; and hiring a combine 15,000 dram/ha. This means that about half of the money received from selling an average yield is spent on hiring a tractor and combine, not counting the costs for other inputs such as seeds and fertilizers. In addition, yields can below, especially in years with little rainfall and where irrigation is not available.

Use of chemical fertilizers and pesticides

37 persons were asked about the use of chemical fertilizers in their fields and homestead gardens. Considering that three-fourth are involved in agricultural production, over half of those use chemical fertilizers (only nitrogen), mainly for vegetables and wheat. The amount of the fertilizers applied varied from 20 kg/ha up to 280 kg/ha. About three-fourths of the respondents engaged in agriculture use all or part of their manure for fertilizing their garden or fields. Thus a few respondents apply both chemical and organic fertilizers. Because fertilizers are considered expensive, the local government arranges the purchase of fertilizer at reduced prices.

The use of pesticides is also quite common in Dzoraghbyur. Nearly half of the respondents (which is more than half of those involved in agriculture) use pesticides once or twice a year, mainly in their orchard trees. Most used are insecticides against caterpillars and aphids. A few respondents also mentioned the use of rodenticides. The most used insecticides are "B-58" (dimethoate) and "Karate" (Lambda cyhalothrin; suspected as endocrine disruptor). Both of these pesticides correspond to class II according the WHO classification (i.e. if possible the use of these should be avoided). Among the other mentioned pesticides were "Tsimbuzh", "Arevo" and "Chlorophos" (carcinogen, cholinesterase inhibitor). Less than half of the respondents who use pesticides stated to wear protective clothes while spraying. Among those who do not wear protective clothes, one fourth had complaints on health, mainly headache.

Livestock

The interviewed village council member estimated that approximately 70% of the households keep cattle. Among the survey respondents nearly half keep at least one cow (and maximum 3 cows). The cows of the respondents' households gave 4 to 10 litres of milk per day, with 6 litres per day mentioned most often. Most respondents consume their own milk and milk products. Selling diary products is not as widespread as in the two other project villages. For a poor respondent, however, a substantial part of the household income is from selling calf's meat (veal) once a year.

The major livestock related problem in Dzoraghbyur is the absence of pastures. Some households have hay land (mostly between 1 – 3,5 ha); others rent hay land from neighbours who do not keep cattle. As mentioned before, there is one large private cattle farm, with 400 cows, but without land. Poultry is common and many households keep some chicken (generally not more than 10 per household). A few keep turkeys. Keeping pigs, sheep or other cattle is not common in Dzoraghbyur. There is a veterinarian in the village, who controls the health of the animals and gives vaccinations.

5.7 Water Sources, Quality and Uses

Water Sources and Water Quality

In the past there were 18 natural springs in Dzoraghbyur, which gave the name to this village: "the canyon of springs". In the last 30 - 50 years most of these springs were covered by the construction of private houses. Now there are only 5 springs left, three of them supply drinking water for Dzoraghbyur. Because of the relatively low location of these three springs, they were equipped by the pumps. No treatment of drinking water takes place. All households in the village are connected via pipelines to one of the water sources and most have an in-house water connection. Households have to pay for the water, but there is a fixed monthly fee (i.e. not based on water meters but rather on costs for electricity to pump the water), collected by the state owned water company Hayjrmugh (Armenian Water and Sewage Company AWSC). There is one public tap on the main street.

The quality of drinking water in Dzoraghbyur is monthly monitored by Hayjrmugh. When the water of one or more sources is found to be polluted, which especially occurs in rainy seasons, the Hayjrmugh employees are supposed to chlorinate it (manually). However, some respondents reported that Hayjrmugh does not always treat the water when required. Sometimes when the water quality is below standards, these results are just announced to the villagers and they are advised to boil the water. Apparently these advices do not reach all inhabitants or are not followed by all, because outbreaks of diseases such as diarrhoea are common, also in winter. An important reason for the often high microbiological pollution of the drinking water is the absence of protection zones around the water sources: only one of the 5 water sources has a kind of sanitation zone. In case of the other sources manure heaps and drainage channels that receive sewage waste are situated close to the source itself and/or in their catchments area. Pit-latrines form another source of pollution. As an example, the doctor informed that water from the "Yatakh" spring is pumped through private yards with pit latrines, thus risking water pollution by faecal materials. The water from this spring is always of a very poor quality: according to the doctor, the coli index gives bad results and the organolepthic characteristics are not acceptable.

Box 5.3: Water supply in Armenia

95.5% of the water supply in Armenia comes from groundwater sources providing water of constant quality. Water quality in places with a direct (household) water supply generally meets the national and WHO standards for organoleptic, toxicological and microbiological indicators. In almost all urban areas, and in most rural settlements, water is supplied according to a timetable and people receive water for 2 to 6 hours a day, even though adequate water for full time supply is available water at most source. The cuts in the supply are because of the bad state of the pipe network (and to save on electricity – from the authors). Almost half the water supply pipes in Armenia are pressure conduits in intermittent operation and frequently cut off because of the high cost of electric power. In addition, because the pipes are worn out and leaking, a large amount of water is lost in the distribution network.
Because of the above, water supplied through the centralized network frequently does not comply with microbiological standards, which leads to problems in delivery of water from the source to the consumer, i.e. from what is termed secondary pollution of water. The increased risk to health is reflected not as an increase in general morbidity from intestinal infections but as an increase in the number of outbreaks of water-borne infections, which may affect a large number of people.

Source: World Health Organization (WHO.) 2001. Highlights on health in Armenia. Electronic version: http://www.euro.who.int/document/e72377.pdf

Almost no-one among the respondents was satisfied with the supply and quality of the drinking water. They complained about the bad supply of drinking water in summer: sometimes the water is supplied only for 1-2 hours per day, while approximately 30% of the households, which are situated relatively far from a water source, do not get any water at all. The interviewed village council member explained that the water supply needs to be reduced during the summer to save on the electricity bills. In the winter the pumps have to be working full time, because if they are switch off, the water will freeze, causing the pipes to break. As a consequence of the cut-offs in summer, respondents told that they collect water in containers such as bath tubs, buckets or pans, during the few hours that water is supplied, or fetch water from a spring in the canyon (500 – 900 m from their households) if water is never reaching them.

Most complaints about the quality of the drinking water concern its turbidity (especially in spring), the strong chlorine smell (if chlorinated), the murky colour of water and the high level of pollution. One respondent complained about sewage mixing up with drinking water and three other respondents told that they saw worms floating in their drinking water.

Use of Water

As most of the households have an in-house water supply connection, the amount of water that is used per household is significantly higher than in the other two project villages. For example, over three-quarters of the respondents have flush toilets and nearly three-quarters have showers or baths. Over half of the households have functioning washing machines, although usually old ones. The actual water consumption decreases significantly in winter because water and sewage pipes can easily freeze and break, and consequently many households avoid using the centralised water system and their flush toilets during very cold days. Instead, they fetch water from the tap on the street. Therefore, most respondents who have a flush toilet, also have a conventional pit-latrine in their yard, which they mostly use in winter. The same situation applies to the use of bathrooms and during the winter people prefer to wash themselves in big tubs to avoid frozen pipes when using the shower.

The peak of water consumption is in summer but, as mentioned before, this is the season when the village council can save money by switching off the pumps. Thus the peak in water supply is, ironically, in winter, when demand is much lower than in summer.

Water for Irrigation

There was a well-established irrigation system in Dzoraghbyur during the Soviet period when the village had large fruit orchards. As mentioned already, the irrigation system discontinued working in the early 1990s because of the nation-wide shortage of electricity. At this moment the system would first need considerable rehabilitation before it can become operational again. Only a small sub-system is now working allowing 50-60 households of the 700 in Dzoraghbyur to irrigate homestead gardens or fields. This irrigation water is supplied from an artificial lake that receives both spring water and water from the drainage channels. Because the drainage channels convey also sewage water, the irrigation water is polluted. Households that use this irrigation water complain that it is not clean, smells like sewerage and sometimes has a green colour. Users of irrigation water have to pay for it. Some households, who do not have access to this irrigation water, try to irrigate their gardens by using drinking water. Because the payment for drinking water is not based on a water meter (but is a fixed monthly fee), the extensive use of drinking water for irrigation does not affect the amount of a household's water bill. The price for (an unlimited amount of) drinking water is about 1200 dram/month, whereas the costs for irrigation water can amount to 4000 - 5000 dram/month per household in the irrigation season. Still, many respondents are eager to have proper irrigation again because this will allow them to increase their agricultural activities.

5.8 Sanitation and Waste Disposal

Sanitation

Although all households in Dzoraghbyur have an in-house water connection and about three-quarters have flush toilets, there is no central sewage system in the village. Approximately 60% of the households have a kind of septic tanks or pits, but these are not emptied and the sewage liquid just infiltrates into the ground. About 20-25% of the households drain their waste and sewage water into the open drainage channels that discharge into the artificial lake. The drainage channels cross the village, sometimes at a short distance to the springs or the water supply lines. For example, close to the lake a drainage channel (polluted with sewerage) runs within a few meters of a spring which is one of the sources of drinking water. Many respondents are concerned about the absence of a proper central sewage system (and treatment) and are aware that this affects the quality of their drinking water. One respondent told that during the Soviet times the sewage was collected in Dzoraghbyur and transported to a neighbouring town to the treatment plant.

A small part of the households only have a pit-latrine as toilet. But because most households with a flush toilet, also have a pit-latrine as well (which they use in winter and in summer when the water supply is interrupted), there are pit-latrines in almost all yards in Dzoraghbyur. The pits are not as shallow as in Hayanist; a depth of 4 m was mentioned. Most pits are not sealed and, when full, they are usually covered by earth. Some households, however, empty a pit that has become full. For example, a respondent mentioned that they empty their pit once every two years, keeping the faeces in a heap for 1 year, and thereafter mix it with the soil to fertilize the homestead garden.

Solid Waste Disposal

There is neither a waste collection system in Dzorahpbyur, nor a site to dump the waste. The waste disposal problem is considered very critical and it stands high at the agenda of the village council. The interviewed village council member informed that during their last meeting it had been decided to rent a truck for solid waste collection. It had not been decided yet how much households would have to pay for this service, nor assessed whether it would be affordable for Dzoraghbyur's inhabitants.

Out of the 36 respondents who were asked about what they do with their solid waste;

- 21 mentioned that they burn part and dump another part at illegal sites inside or outside the village;
- 11 respondents do not burn any waste but dump all at illegal sites
- 2 respondents said to bring their waste to garbage containers in the nearby town; and

- 1 respondent burrows their waste into the soil at his yard.

Almost 50% of all respondents stated that they also burn plastic. Half of them burn plastic only outdoors; the other half sometimes burn plastic indoors and sometimes outdoors. Nearly three-quarters of the respondents do know that burning plastic is not good for their health. However, many people assume that good ventilation will prevent any harm to their health, as they think that "*ventilation will suck out all fumes*".

The main reason for people to burn their waste is the absence of a waste collection system or an authorised landfill. All respondents are interested in having a proper waste collection system in their village and are willing to pay for such a service. They mentioned sums from 150 to 300 drams per month, with 200 dram per month as the amount that was most often mentioned.

Organic Waste and Composting

The use of manure as fertilizer is also higher in Dzoraghbyur than in the other two project villages. Most respondents who are engaged in agriculture, use (most of their) manure to fertilize their gardens or fields, whereas one-sixth use it mainly as fuel. Most respondents do some kind of composting of the manure and a few dry it in the sun. Regarding garden waste: most respondents burn it; a few bring it to (illegal) dump sites. A few respondents either use garden waste as a fodder for their cattle or keep the waste on the land and dig it in spring into the soil.

5.9 Health, Diet and Hygiene

Health

The medical staff of Dzoraghbyur's health centre informed that heart and blood related diseases are the most common ones among adults. Children suffer most from intestinal disorders and infectious diseases. Especially, there are many cases of diarrhoea among babies. Outbreaks of diarrhoea among all inhabitants are common both in summer and winter. Intestinal parasites are also rather widespread. The doctor mentioned that *ascaris* (round worm) and pinworm infections are most common. Last year the village received UNICEF help in the form of medicines against these parasites.

The survey results confirmed the prevalence of intestinal disorders and several respondents mentioned that one or more of their young children had been hospitalized due to dysentery or other such infections. One respondent said that her 6 month old child died from dysentery last year.

Diet

The food consumption pattern of the inhabitants of Dzoraghbyur is more diversified than in the other two project villages. Most respondents daily consume bread and potatoes and diary products are either consumed daily or several times a week. Consumption of vegetables and fruits is more common because the circumstances in Dzoraghbyur better allow their cultivation. Most households prepare fruit and vegetable preservations for the winter. Several respondents even consume preserved fruits and vegetables regularly. There are, however, also households that do not (often cannot) cultivate vegetables or fruits, and their consumption of fruits and vegetables is limited. As most households of Dzoraghbyur have (relatively) somewhat better incomes than in other two project villages, people are less compelled to sell own produce such as vegetables or dairy products, but consume more themselves. Consumption of meat, however, is low. More than half of the respondents eat meat less than once a month, which is often only at special occasions such as holidays or birthdays. Just over one-third consume meat more regularly.

Box 5.4: How Armenian people bake lavash (Armenian bead)

It is very common in rural areas to bake own bread – lavash. Almost every household has its own "bread house" – a small shed in the yard with the hole of 1.5 –2 m (deep or wide?) in the ground. The walls of the hole are smoothed and covered with a layer of clay. On the bottom of the hole dried manure is burned and the dough is stuck to its walls. Baking lavash is women's responsibility. They prepare the dough near the hole, while squatting on the ground. Some husbands make special holes that allow the wife to put her feet into, as making lavash is a long procedure and legs can start hurting from squatting.

Making lavash is a traditional custom. A respondent explained that Armenians had to make fire in holes for safety reasons so that nobody, in particular any enemies, could see the fire. Armenians use manure as a fuel for preparing bread because there are hardly trees and forests in this region.

Hygiene and awareness on health

In general, the awareness about sanitation, hygiene, quality of drinking water and human health is insufficient in this village. Despite regular outbreaks of infectious diseases, some villagers still do not associate such health problems with the drinking water quality and they do not boil water before drinking. Other villagers, who do understand that certain diseases are caused by the poor quality of drinking water, seem not to understand that their own actions are causing pollution of the water sources, for example, by locating manure heaps just uphill of a water source. However, several respondents, in particular those whose family members had suffered from dysentery or other intestinal disorders, always boil water before consumption or do it when Hayjrmugh warns about pollution. One respondent said to filtrate drinking water using a cotton cloth as filter.

30 respondents were asked about their hand washing habits, and the answers were as follows (some gave more than one answer):

- Over two-thirds said to wash hands "in the morning and in the evening";
- One-third said before a meal;
- Only a few said that it is necessary to wash hands after visit to a toilet; and
- Two said "after a meal".

These answers seem to demonstrate that most people actually wash hands while they wash themselves in the morning and before they go to bed. The answers also seem to indicate that people are not sufficiently aware about hand washing as a way to minimise risks from micro-organisms.

5.10 Main problems of Dzoraghbyur as perceived by the respondents

The respondents mentioned the following issues as main problems or priorities:

- Three-quarters of the respondents see an urgent need to improve the supply of drinking water in the village (i.e. the quality of the drinking water and/or an uninterrupted supply). A respondent also mentioned that the old pipe systems and pumps might need replacement.
- The absence of a kindergarten (nearly half of the respondents – mainly women);
- Have a public bath (one-third);
- Improvement of roads within the village;
- Rehabilitate / improve the irrigation system;
- Solve the sewage problem, e.g. by rehabilitating the old system;
- Open a club and/or library in the village (e.g. with computer games); and
- Improve the telephone connections.

5.11 Poverty

Poverty is affecting a considerable part of the population of Dzoraghbyur. Although employment opportunities here are better than in Fantan or Hayanist, there are quite some families that struggle to survive because their income is very low. On the basis of our survey, 90% of the respondents from Dzorahpyur would live under the poverty line as defined on page 2. Because some households lack

money to continue crop cultivation (e.g. to pay for ploughing), but still have to pay land tax, they feel compelled to sell fields or homesteads to get some (temporary) income and to reduce their taxes. But at the same time this decreases their income generating and/or food producing opportunities.

The poorer respondents in Dzoraghbyur cannot afford medical treatment or medicines. Neither can most families afford to (adequately) heat their houses. For example, although the survey was in mid-winter with snow covering the streets, one interview was held outside a house as it was a sunny winter day and the respondents said that at that moment it was warmer outside than inside the house. The local authorities provide some subsidies to the poorest households, such as some subsidies for their water bill.

5.12 Conclusions

1. The major problem of Dzoraghbyur is the quality of the drinking water. Although the water company Hayjrmugh is responsible for the maintenance of the sources and the monitoring of the water quality, they are not able to guarantee always safe water and the water quality is often poor, especially during the rainy seasons. An important reason of the high microbiological contamination of the water is the absence of any protection zones around the water sources. Thus it is possible (and common) to store manure and dump waste near the sources and to have latrines with unsealed pits close by. Furthermore, the absence of a proper sewage system adds to the pollution of both surface and ground water. There is no proper water treatment; however, if proper protection measures would be taken, it is unlikely that treatment of drinking water be necessary.

2. Water is in short supply, especially in summer, not only because of an increased consumption, but also because the water company reduces the number of hours that the pumps are operating to save electricity. Approximately 30% of the households do not receive any drinking water at all in summer because (1) they are situated at the end of the pipelines; (2) the water supply is deliberately interrupted, and (3) because some households use drinking water to irrigate their gardens.

3. The collapse of the irrigation system had a significant impact on agriculture in the village, reducing yields or making agricultural production impossible. In particular, fruit production was decimated. At the moment only 50-60 households out of 700 are able to irrigate their gardens or land with irrigation water that is heavily polluted by wastewater. The profitability of agriculture is also affected by the relatively high prices of inputs versus low yields and low farm gate prices for products. Consequently, a number of -especially poor- households discontinue agriculture and people are even compelled to sell land, also because they are not able to pay the land tax.

4. The absence of a (centralised) sewage system and treatment leads to the pollution of both surface and ground water. Waste water and sewage either infiltrates into the soil, or is conveyed through (open) drainage channels into streams or a lake. Because the drainage channels are close to the sources or pipes of the drinking water, contamination of drinking water by sewage is likely, thus contributing to outbreaks of infectious diseases.

5. Most households of Dzoraghbyur can be considered poor. The outbreaks of diarrhoea caused by polluted drinking water tend to enhance poverty because it increases the medical expenses of the villagers (as medical treatment and medicines are not free of charge).

6. There is insufficient awareness among the population about the linkages between the quality of drinking water and human health. Some inhabitants are aware that their diseases are caused by bad drinking water, but people do not -or cannot- take appropriate precautions. For example, people do often not boil the water before consumption, they continue to pollute water sources by storing the manure nearby and allow sewage to pollute the water.

7. There is no satisfactory solution for solid waste management. There is neither a waste collection system nor a proper dump site. Consequently, waste is either dumped at illegal sites or burned. Even plastic is burned although half of the respondents know that it is harmful for human health.

8. The use of manure as fertilizers is more common in Dzorahbyur than in the other project villages. Manure is also used as fuel, but rather to supplement other types of fuel or for baking the Armenian bread. Most villagers who are involved in agriculture do not compost garden waste (it is mainly burned). The present use of chemical fertilizers is much less than during the Soviet time as most households do not have enough money. Just over half of the households engaged in agriculture apply nitrogen fertilizers at varying levels.

9. The use of pesticides is common in homestead gardens, especially against aphids and caterpillars. Due to poverty villagers use pesticides only when they consider it really necessary. Some of the used pesticides are classified as very harmful, however, inhabitants lack awareness about risks and neither know about alternative pest control measures.

5.13 Recommendations

1. It is necessary to raise more awareness among the population of Dzoraghbyur about safe drinking water, protection of sources, treatment of water (e.g. boiling) and about the linkages between the quality of drinking water and human health. Storing manure and waste in the proximity of water sources should be discouraged and repair or sealing of septic tanks and latrine pits encouraged, including emptying them on a regular basis. Moreover, proper disposal of sewage and waste water is required. It should be investigated whether eco-sanitation toilets are appropriate for the conditions of Dzoraghbyur and whether the people would be interested (since they also have the option of flush toilets).

2. There is a need to collect and review geo-hydrological data about the water sources of the village and based on this information assign appropriate sanitation or protection zones, where activities that might pollute the water are forbidden.

3. It should be investigated if any buried springs could be identified and rehabilitated, in order to increase the quantity of water for the village. To reduce the use of drinking water for irrigation (and thus make water again available in summer for those at the end of pipelines) water pricing based on water meters should be considered.

4. It is recommended to investigate the possibilities to renovate (rehabilitate) the irrigation system for Dzoraghbyur. The feasibility should also be assessed, including a cost-benefit analysis, to ensure that farmers can afford to pay for the irrigation whilst keeping (or making) agriculture profitable.

5. It is recommended to investigate the improvement of the drainage / sewage system in the village to reduce contamination of the drinking and irrigation water as well as exposure of villagers to sewage or water polluted with sewage. This should include a review of the sewage treatment that existed during Soviet times and an assessment of whether this could be renovated and at what costs.

6. More awareness is needed about the health impacts of burning plastic waste and burning plastics should be discouraged. The most elegant solution would be to arrange the collection of plastic waste separately for recycling (if such recycling is possible in Armenia).

7. Awareness, knowledge and skills should be enhanced about organic or low external input agriculture, the benefits of composting, alternative organic pest management, etc. Promotion of ecosan toilets among the households should be also interesting for agriculture since its products (urine and composted human faeces) are very suitable to replace chemical fertilizers.

8. It is recommended to (support the local authorities to) introduce a proper solid waste collection system in Dzoraghbyur or to allocate a proper site somewhere in or around the village for dumping waste. It would be attractive (if possible) to introduce a waste separation system in order to minimize the waste flows and to increase recycling.

ANNEX 1

QUESTIONNAIRE FOR LONG INTERVIEWS

Name of village:
Number of interview:
Name of interviewer:
Date of interview:
Locations of the residence (describes and indicate on map):

1. Profile of respondent's household:

S/n	Name (optional)	Relation to respondent	M/ F	Age	Highest education level obtained	Main occupation *
1		Self				
2						
3						
4						
5						
6						
7						
8						
9						

*Main occupation:
1 : too young
2 : student
3: full time working (specify nature of work)
4: part time working (specify nature of work)
5: unemployed (looking for work)
6: full time housewife
7: retired
8: (chronically) ill, handicapped, etc.
9: others: specify

2. Income:

2.1 Amount and main source(s) of income (this can be from work (specify), pensions, allowances, etc.) for each household member (serial number) who receive any income (per month):

2.2 If respondent seems willing to provide such information, determine the average monthly income of the household (total):

2.3 *Comment / remark by the interviewer: do you think this income seems correct?*
If the respondent does not provide information about the households total monthly income, please make either an estimate or indicate whether the family seems poor or well-to-do.

3. **Agriculture**: Does this household own or lease any agricultural land (also include any homestead land used for (vegetable) cultivation) and/or has any animals? If no, go to question 4.

3.1 Size of agricultural land? …..Ha owned .... Ha leased

3.2 How much land did you cultivate last season (2004)? …. Ha (including homestead)

3.3 Which crops did you grow? What was the yield last year (if possible in kg/ha)

3.4 Did you use organic fertilisers (manure)? If yes, from own animals or did you buy?

3.5 Did you use any mineral fertilizers? If yes, for which crops and how much (in kg/ha)?

3.6 Did you use any agro-chemicals like pesticides or herbicides? If yes, what kind and for which crop and how many times did you apply them during last season?

3.7 Did you grow potatoes? If yes, did you apply any insecticide against Colorado Potato Beetle? What kind and how often during the last season?

3.8 Does the person who sprays the insecticides use any protective clothing and mask while spraying?

3.9. Did the persons from your household who sprays the insecticides have any complains on his/her health (e.g. headache, skin rashes, nausea, etc) after spraying/applying pesticides? How do you alleviate such symptoms?

3.10. Did this household cultivate crops for own consumption only or did it also sell (part) of the produce?
If produce was sold, which crops where these?
What was then value of the sales in 2004?

3.11. Is this household keeping any animals (excluding pets)? If yes, what kind and how many?

3.12. Does this household keep a cow? If yes, how many litres of milk per day produced their cow last year (maximum production)?

3.13. Does these household keep animals for own consumption or does it also sell animals or animal products (like milk, eggs, etc.) or both? (explain, including amount sold)

3.14. What kind of fruits does this household grow and for which purpose? (own consumption, preservation, sale)

3.15. Division of tasks (what is done by men, what by women, what together? (Use N.A. if not applicable))

Land preparation	
Sowing	
Fertilizer application	
Weeding	
Spraying agro-chemicals	
Harvesting	
Marketing	
Feeding	
Cleaning stable / cot	
Going to veterinaty	
Selling of produce	

Fill in: M=only by men;
Mw=mainly by men, with some help of women
MW= equally by men and women
Wm=mainly by women, with some help of men
W= only by women
NA= not applicable

3.16. Was the last season an average season or not? If not, explain why.

If yes, explain (kind and amount of chemicals used, possibly for which crops):

4 Expenditure:
4.1. Main items of expenditure (list).
If possible, give an indication of the monthly or annual expenditure on each item:

4.2. Do you pay for drinking water, and if so, how much (in dram/month):
If you pay for water: is it according to a water meter or a fixed amount per month?

4.3. Do you pay for irrigation? If yes, how much (dram/season)?

4.4. How much do you spend on electricity (in dram/month)?
In summer: in winter:

4.5. How much do you pay for gas, bottled gas and/or wood (in dram/month)?
For gas: In summer: in winter:
For bottled gas: in summer: in winter:
For wood: per cold season: per warm season:

4.6. How much do you pay for medicines per month (or per year)?

4.7. What proportion of your income do you spent on food?

4.8. Any other major items of expenditure?

4.9. Who decides most on spending the money in your household?

4.10. *Any comments by the interviewer:*

5. Housing, water supply and sanitation
5.1 In what kind of house is the family living (describe)?

5.2 What is the general state of maintenance of the house?

5.3. What is the source of water supply for this household? (same in summer and winter? Same for drinking water and technical water?)

5.4. If you do not have a home connection, how far do you have to go to fetch water?

5.5. Does the household have a shower or a bathroom?
If not, how / where do you (and your household members) go to wash yourselves?

5.6. Does the household have a washing machine? If yes, what kind?

5.7. In your opinion, what is the quality of 1) drinking water and 2) irrigation water?

5.8. Are you satisfied with the current drinking water supply; if no, why?

5.9. Are you satisfied with the current irrigation water supply; if no, why?

5.9a. Did you receive water for irrigation of 1) of your vegetable garden, 2) for the fields

5.9b. In your opinion was it enough water for irrigation last year?

5.10 Type of sanitation (including: any water-flush toilet?):

5.11 What kind of enforcement (walls) has the toilet pit? (without enforcement, brick or concrete walls?)

5.12 What kind of bottom has the toilet pit? (nothing, gravel, concrete?)

5.13 How is the toilet pit (and/or septic tank) emptied and by whom? How much does it cost? How often you have to empty it?

5.14 Where is the sewage waste disposed off?

5.15 Are you satisfied with the current sanitation; if no, why?

5.16 If not satisfied with the water supply and/or sanitation situation, what kind of improvements do you want (for drinking water and/or sanitation)?

5.17 If the drinking water supply would be improved, are you willing and/or able to pay for such water?
How much per month?

5.18 *Any comments by the interviewer:*

6. Task divison (woman, man, children?) (use N.A. if not applicable):

6.1 What are the specific tasks that are mainly done by men in your household?

6.2. What are the specific tasks that are mainly done by women in your household?

7. Waste and waste water:

7.1. How and where is waste water disposed of?

7.2. How is solid waste disposed of (burn and/or thrown away at the illegal site or thrown to assigned landfill?

7.3. If the garbage is disposed at unauthorised places, are you interested in having an appropriate waste collection system in your village?

7.4. If yes, are you willing and able to pay a small amount of money for proper waste collection?

7.5. Are you burning any waste?
If yes, what kind of waste do you burn? (paper, plastic, other?)
If yes, where do you burn it? (outside the house, in the oven, or else?)

7.6. Are you burning any plastic bottles or other plastic waste? If yes, indoor or outside?

7.7. Do you think that burning plastic can affect your health?

If this household keep animals:
7.8.What do you do with animal dung?

7.9.Do you do any composting? And If yes, how?

7.10. What for do you use animal dung?

For garden waste:
7.11. What do you do with garden waste?

7.12. Do you do any composting of garden waste? And for what purpose (e.g. burning, smth. else)?
7.13. *Any comments by the interviewer:*

8. Health and nutrition

8.1. What kind of health problems did you and/or your family members had last year?

8.2 Is your health or the health of your children affected by the quality or quantity of drinking water? If yes, explain:

8.3. Is the type and condition of your sanitation affecting your health or your children's health?

8.4. How often did you or your family members especially children have intestinal disorders (like diarrhoea) during the last year?

8.5 What is the normal diet of you and your family (main meals consumed)?Products	Every day	Regularly[1)]	Seasonally	Sometimes[2)]	never
Bread					
Potatoes					
Milk products					
Meat					
Eggs					
Fresh vegetables, beans					
Preserved vegetables, including dried beans/ fruits					
Fruits					
Porridges					

1) at least once per week
2) not often, like once per month or less

8.5 How many cups (or glasses) of liquids (excluding coffee or alcohol) do you and your household members consume per day? Is there any difference in adult and children consumption?
And what kind of liquids? (like tea, water, soft drink)? List in order of importance (if different for children, list separately).

8.6 When do you think it is necessary to wash hands? Are you always doing it?

8.7. If the respondent has children: At what age (in number of months) did you give your children any drinking water (either plain or to make formula milk)?

8.9 At what age did you start giving other food (than breast milk) to the children? And what was the kind of food you gave first?

8.10 *Any comments by the interviewer, in particular on the observed hygiene situation of the household:*

9 Community activities

9.1 Are you or any member of your household involved in any community activities (for example: parent committee, church, village council, club, etc? If yes, explain

9.2. If you have any problems, from which persons outside your own household could you get any support?

9.3. Do you have any relatives living and/or working abroad? If yes, do they sometimes help you and how?

9.4. Did you have any support from the major or the village council?

9.5. Would you be interested in participating in a community committee to discuss and find solutions for problems in the village?

9.6. If such a committee would be established, who –in your opinion- should become member of such a committee?

9.6 *Any comments by the interviewer:*

10 Needs and priorities

10.1 What do you see as the main problems of you and your household (list in order of importance)?

10.2 If you would get any additional money, on what would you spend it?

10.3In your opinion, what are the most urgent problems in your village that need to be addressed?

10.4 Regarding agriculture and/or livestock keeping: what kind of improvements would be needed for your situation?

10.5 What would be needed to improve the health situation of you and your children?

10.6 *Any comments by the interviewer:*

ANNEX 2

QUESTIONNAIRE FOR SHORT INTERVIEWS (IMPACT INDICATORS)

3.5 Did you use any mineral fertilizers? If yes, for which crops and how much (in kg/ha)?

3.6 Did you use any agro-chemicals like pesticides or herbicides? If yes, what kind and for which crop and how many times did you apply them during last season?

3.8 Does the person who sprays the insecticides use any protective clothing and mask while spraying?

3.9. Did the persons from your household who sprays the insecticides have any complains on his/her health (e.g. headache, skin rashes, nausea, etc) after spraying/applying pesticides? How do you alleviate such symptoms?

3.12. Does this household keep a cow? If yes, how many litres of milk per day produced their cow last year (maximum production)?

5.9a. Did you receive water for irrigation of 1) of your vegetable garden, 2) for the fields

5.9b. In your opinion was it enough water for irrigation last year?

5.10 Type of sanitation (including: any water-flush toilet?):

5.13 What is done if pit-latrine and/or septic tank is full?

7.2. How is solid waste disposed of (burn and/or thrown away at the illegal site or thrown to assigned landfill?

7.6. Are you burning any plastic bottles or other plastic waste? If yes, indoor or outside?

7.7. Do you think that burning plastic can affect your health?

7.8. How the animal dung is used or disposed of?

7.9. Do you do any composting? If yes, how?

7.10. What for do you use animal dung?

7.11. What do you do with garden waste?

7.12. Do you do any composting of garden waste? And for what purpose (e.g. burning, smth. else)?

8.4. How often did you or your family members especially children have intestinal disorders (like diarrhoea) during the last year?

8.6 When do you think it is necessary to wash hands? Are you always doing it?