Report No. 41181-AM

Armenia
Geographic Distribution of Poverty and Inequality

June 2007

Human Development Sector Unit
Europe and Central Asia Region

National Statistical Service
Yerevan, Armenia

Document of the World Bank

Vice President:	Shigeo Katsu
Country Director:	Donna Dowsett-Coirolo
Sector Director	Tamar Manuelyan Atinc
Country Manager	Aristomene Varoudakis
Sector Manager:	Arup Banerji
Task Team Leader:	Lire Ersado

Report No. 41181-AM

ARMENIA

Geographic Distribution of Poverty and Inequality

June 2007

Human Development Sector Unit
Europe and Central Asia Region

National Statistical Service
Yerevan, Armenia

Vice President:	Shigeo Katsu
Country Director:	Donna Dowsett-Coirolo
Sector Director	Tamar Manuelyan Atinc
Country Manager	Aristomene Varoudakis
Sector Manager:	Arup Banerji
Task Team Leader:	Lire Ersado

CONTENTS

Page

Figures

Tables

ACKNOWLEDGEMENT

This report is part of the Armenia Programmatic Poverty Assessment work. It is jointly produced by the National Statistics Service (NSS) of the Republic of Armenia and the World Bank. This joint product between the NSS and the World Bank follows the long tradition of good cooperation between the Government of Armenia and the World Bank to better understand poverty and living conditions of the people of Armenia.

The work could not have been possible without the strong support of the President of the NSS, Mr. Stepan Mnatsakanyan. Other key members of the team from the NSS side included Ms. Diana Martirosova (Head, Household Survey Division), Ms. Karine Kuyumjyan (Head, Population Census and Demography Division), Laert Harutiunyan (Head of Division, Information Technology Department), and Ruzana Hovhanisyan (Programmer), who were instrumental in the preparation of the data and writing of the final report.

The task on the World Bank side was carried out by Lire Ersado (Economist, ECSHD) under the guidance of Donna Dowsett-Coirolo, Country Director for South Caucasus Country Unit, Arup Banerji (Sector Manager, ECSHD) and Aleksandra Posarac (Lead Economist and Coordinator for Human Development Sector, South Caucasus Country Unit). Gorana Kristic (Consultant, ECSHD) has contributed to the report by managing the 2004 Integrated Living Conditions Survey and the 2001 Population Census data and by preparing survey-based poverty estimates. The peer reviewers were Peter Lanjouw (Lead Economist, DECRG) and Salman Zaidi (Senior Economist, ECSPE). Useful comments were also received from Oleksiy Ivaschenko (Economist, ECSHD) and participants at the Decision Meeting.

I. INTRODUCTION

Background

1. **Armenia has achieved impressive economic growth and poverty reduction since the late 1990s**. The growth is attributable to successful reform efforts, including stabilization and structural reform programs to transform its economy to a market-oriented one and steps taken to create an improved business climate. The country's GDP has grown at an astounding annual rate of over 11 percent since 2002. This robust growth has been accompanied by substantial reduction in the incidence of poverty. Recent poverty estimates by the World Bank and the National Statistics Services of the Republic of Armenia (NSSA), based on comparable 1998/99 and 2005 Integrated Living Conditions Survey (ILCS), indicate that poverty rate has fallen from around 56 percent in 1998/99 to below 30 percent in 2005 (Table 1).[1] During the same time period, extreme poverty declined from 21 percent to below 5 percent, about a 75 percent decline.[2] In absolute numbers, over 800,000 people were lifted out of poverty between 1998/99 and 2005. This outstanding decline in poverty is attributable in part to double-digit economic growth, the increase of labor income, private transfers from abroad, and the increase in social transfers through a well-targeted family poverty benefits program.

Table 1: Armenia has achieved impressive reduction in poverty between 1998/99 and 2005

	1998/99			2005		
	Very Poor	**Poor**	**Share in total population (%)**	**Very Poor**	**Poor**	**Share in total population (%)**
Urban	26.2	62.1	57.1	5.3	30.7	63.5
Yerevan	24.8	58.4	27.7	3.6	23.9	32.6
Other urban	27.4	65.5	29.4	7.2	37.8	30.9
Rural	14.1	48.2	42.9	3.2	28.3	36.5
Total	**21.0**	**56.1**	**100**	**4.6**	**29.8**	**100.0**

Source: Social Snapshot and Poverty in Armenia, the World Bank and the National Statistical Service of Armenia, February, 2006; ILCS 1998/99 and 2005.

2. **However, despite this remarkable economic growth experience, close to 1 million out of the estimated 3.2 million Armenians still live below the poverty line and the spatial heterogeneity and the magnitude of disparities in the living conditions of the population are large.** These disparities in the standards of living across various geographic areas are explained in part by regional differences in climate, environmental conditions, and differentiated exposure to natural and man-made shocks, and different economic structure. Like in many other

[1] Social Snapshot and Poverty in Armenia 2004, the World Bank and the National Statistical Service of the Republic of Armenia, February, 2006.

[2] Consumption is measured per *adult equivalent*. Poverty indicators are computed using the *2004 minimum food basket* and the non-food share and adjusted for inflation. In 1998/99, the overall poverty line and extreme poverty line in 2004 prices were 17,663 and 11,210 drams per adult equivalent per month, respectively. In 2005, the overall and extreme poverty line amounted to 20,289 and 13,266 drams per adult equivalent per month in 2004 prices, respectively.

developing countries, extreme poverty in inaccessible areas often coexists with relative affluence in more favorable locations close to cities and markets. Data from the Armenia Integrated Living Conditions Survey (ILCS), the main source of data for poverty measurement in the country, shows that geographic location significantly affects a household's likelihood of being poor.

3. **World Bank poverty assessments for Armenia using the ILCS data show that poverty in Armenia is more an urban than a rural phenomenon, due mainly to significantly higher incidence of poverty in urban areas outside the capital city.** In 2005, poverty was most severe in urban areas outside Yerevan, where almost 38 percent of the population lived below the poverty line, compared to less than 24 percent in Yerevan and about 28 percent in rural areas (Table 1). However, the gap between urban and rural poverty rates has been narrowing substantially since 1998/99 owing in part to higher growth elasticity of poverty in urban than in rural areas and better integration of urban areas with growing labor markets owing to the recent robust economic growth.[3] As it is the case in most countries in the Former Soviet Union (FSU) block, capital cities have benefited the most from improved economic performance, while urban areas outside the capital cities have benefited little (Alam *et al.,* 2005). The disparity between Yerevan and the rest of the country in the pace of poverty reduction is striking. The poverty headcount ratio of Yerevan has declined by over 34 percentage points between 1998/99 and 2005, while that of other urban areas has declined by about 28 percentage points during the same period. The capital city, where most of the economic opportunities are concentrated, has thus experienced the highest reduction in poverty incidence between 1998/99 and 2005.

4. **Furthermore, in 2004, for which we have an ILCS data representative at the regional level for the first time, poverty incidence varied significantly across the regions (*marzs*).** For example, in Shirak[4] *marz* nearly 50 percent of the people lived below the poverty line, compared to less than 1 in 3 in Yerevan (Table 2). Other regions with poverty incidence higher than the national average included Gegharkunik, Kotayk, Syunik, Armavir, and Aragtzotn. In contrast, Vayots Dzor and the capital city of Yerevan experienced the lowest poverty incidence. While these urban-rural and *marz* level differentials in the incidence of poverty are useful for higher level policy interventions, further disaggregation (e.g., poverty rates by urban and rural within a *marz*) is needed to fully uncover the spatial heterogeneity of poverty in Armenia.

[3] See Chapter V on labour markets in Armenia in Social Snapshot and Poverty in Armenia 2004, The World Bank and the National Statistical Service of Armenia, February 2006.
[4] Shirak is a high altitude *marz,* which was devastated by the 1988 earthquake.

Table 2: There are important geographic disparities in living standards

	1998/99		2004			
	Very Poor	**Poor**	**Very Poor**	**Poor**	**Share in the poor (%)**	**Share in total population (%)**
Yerevan	24.8	58.4	6.1	29.2	26.8	31.8
Aragatzotn	22.8	60.5	5.6	35.4	5.5	5.4
Ararat	13.3	52.3	6.4	32.7	8.5	9.0
Armavir	10.2	41.7	6.6	36.0	8.9	8.6
Gegharkunik	11.3	49.9	4.5	41.9	8.3	6.9
Lori	30.0	62.6	4.5	31.3	8.7	9.6
Kotayk	24.5	61.7	9.2	39.3	10.4	9.1
Shirak	33.0	75.8	10.4	48.8	13.1	9.3
Syunik	18.7	53.1	5.9	36.5	4.7	4.5
Vayots Dzor	12.9	34.7	4.1	28.9	1.4	1.7
Tavush	9.3	29.3	3.3	30.5	3.6	4.1
Total	21.0	56.1	6.4	34.6	100	100

Source: Social Snapshot and Poverty in Armenia, the World Bank and the National Statistical Service of Armenia (NSSA), February, 2006; ILCS 1998/99 and 2004.

5. **These spatial disparities in poverty incidence and the pace of poverty reduction suggest not only that the benefits of recent economic growth have not evenhandedly reached all corners of the country, but also the importance of geographic factors in development policy design, social assistance targeting, and other public resource allocation decisions for poverty reduction**. There is growing recognition that location is an important determinant of welfare, with the local agro-ecological resource endowment, access to input and output markets, remoteness, inhospitable border with some neighboring countries, and availability of quality educational and health facilities all influencing the well being of households. The apparent disparities among the different geographic locations also suggest that the allocation of resources and the design of policies tailored to local-level conditions require information disaggregated at smaller administrative levels. While a wide variety of locally disaggregated data and maps tend to be available to inform this process (e.g. on schools, agricultural production, roads, weather, etc.), quantitative measures of welfare at smaller geographic units, such as cities, towns, or villages are rarely available to aid policymakers. In particular, information on spatial distribution of poverty, which is instrumental in achieving greater effectiveness in social protection and poverty reduction efforts, has not been available to Armenian authorities.

6. **To further reduce poverty and to mitigate spatial disparity, it would be important to better understand the geographical distribution of poverty**, which in turn would require estimating poverty at lowest possible administrative level. Armenia has 11 *marzs* (including Yerevan) and 929 communities, which represent the lowest government administrative units. While poverty rates can be estimated at the *marz* level using the 2004 ILCS data, such estimates are not available for smaller geographic units within the *marz*. The existing sources of data typically used for poverty measurement such as the Armenia Integrated Living Standard Survey (ILCS) are inadequate by themselves to estimate poverty at lower administrative levels. Neither the ILCS, nor the population census, is appropriate to produce statistically reliable poverty estimates at levels below the *marz*. The ILCS data are generally not representative beyond

urban-rural divides at the national level. In contrast, Census of Population of 2001 can be disaggregated to a lower level but does not include information on household consumption and income. Hence, the actual usefulness of both the ILCS and the census is limited for the design of poverty reduction interventions and targeting of poverty reduction resources at local levels.

7. **The NSSA and the World Bank have adopted a statistical inference technique for poverty mapping, which allows reliable estimation of poverty and inequality down at the *rayon* administrative level**. This technique involves combining information from household surveys such as the Armenia ILCS with the population census to allow computing poverty rates at the finely disaggregated levels. The poverty mapping methodology exploits respective strengths of survey and census data. On the one hand, the surveys (e.g., the ILCS) are good sources of data for measuring household welfare and distributional outcomes, but are not representative at low levels of geographic aggregation. On the other hand, the census data has sufficient population coverage, but does not include detailed information on consumption or income to allow quantification of poverty levels. The poverty mapping techniques, which are more fully described in Annex A, are used in developing poverty and inequality maps for Armenia.

8. **While communities represent the lowest administrative tier in Armenia, the limitations in the data used and a small size of most communities make poverty and inequality predictions at that level less robust, except for the capital city of Yerevan.** This is particularly true for rural communities of Armenia, which tend to be very small in size.[5] Therefore, in order to ensure the robustness of poverty mapping results, predictions are made at the next higher level of geographic aggregation, i.e., at the *rayon* level. Note, however, that since only one major urban community exists in most *rayons*, *rayon* level poverty rates for urban areas outside Yerevan are identical to poverty rates at the community administration for these *rayons*. Furthermore, to maintain the precision and the reliability of *rayon* level poverty and inequality estimates, the standard errors of the predictions are closely monitored using procedures explicitly built into the poverty mapping software[6] and following the methodology outlined in the seminal paper by Elbers, Lanjouw and Lanjouw (2003). (See Annex A for details).

Objectives and Target Audience

9. **The main objectives of Armenia poverty mapping exercise are twofold:** (1) To inform policy making at lower administrative levels by providing poverty and inequality rates at smaller geographic areas than it is currently possible with the available data sources; and (2) to build local capacity to develop and update poverty maps, particularly in the National Statistics Services of the Republic of Armenia (NSSA), so that a sustainable use of the poverty maps as part of the policy makers' regular monitoring and decision making tools can be ensured. To achieve the first objective, the exercise utilizes the information in the 2001 population census

[5] See next Section for descriptions on the number and size of various administrative regions of Armenia.
[6] The POVMAP 2.0 software used in this exercise provides a convenient and efficient platform upon which to probe robustness and to explore opportunities for methodological refinement.

and the 2004 ILCS data to predict poverty and inequality at the level of *rayon* and to provide the ranking of all *rayons* (both urban and rural) by their degree of relative deprivation (i.e., poverty).

10. **Moreover, in-house training activities were undertaken to build national capacity for and to ensure the sustainability of poverty mapping tools.** The capacity building activities included a wide range of activities: development of a digital map at the community level, training on a range of estimation/simulation methods and mapping work, and providing a user friendly poverty mapping software developed by the World Bank. The staffs of the NSSA responsible for measuring poverty and management of household and census data were trained in all phases of poverty mapping technique. All stages of the poverty mapping exercises utilized here are fully discussed with these specialists within the NSSA who were identified as key for poverty analysis and mapping in the future. The trained specialists are expected to competently undertake poverty mapping exercise in the future without a need for substantial help from outside. Without such training and capacity building, the current poverty mapping work could have ended up as a one-shot exercise, particularly owing to its high data and technical requirements.

11. **The Armenia poverty mapping report is jointly prepared by the NSSA and the World Bank team.** In addition to training and capacity building within the NSSA, a series of dissemination workshops for the report are planned to create a network of long-term users of poverty maps and inform them of proper uses of poverty maps, which are essential for sustainability and realizing the value of the poverty mapping work. As co-producers of the report, the NSSA and its staff assigned to this task are expected to play a crucial role in the dissemination and presentation of the results to various stakeholders in the government and donor communities.

12. **The target audiences for the outputs of this exercise include policymakers in the Armenian government, the World Bank and other development agencies active in poverty reduction efforts in Armenia.** The poverty maps are expected to facilitate the dialogue on poverty, and on the resource allocation mechanisms at lower administrative levels.

II. DATA SOURCES AND METHODOLOGY

Data

13. **The report makes use of two data sources: The 2004 ILCS and the 2001 Population Census.** The ILCS has been conducted on a regular basis by NSSA, but has not been representative at the *marz* level except in 2004. The 2004 ILCS data was thus chosen for the poverty mapping exercise as it is representative at the *marz* level. The 2004 ILCS contained a sample of 6816 households (about 2016, 3072 and 1728 are Yerevan, non-Yerevan urban and rural households, respectively) and information on household expenditures and incomes and other individual and household characteristics. The population census of 2001 provides a comprehensive record of information on the household socio-demographic conditions, dwelling conditions, and individual characteristics of household members (such as age, education, employment status, etc.). The poverty mapping, by combining the ILCS with census data, generates poverty and inequality estimates for each of the 37 *rayons* where rural communities are located, for the 47 urban communities outside Yerevan and for the 12 districts of Yerevan.

Administrative Regions of Armenia

14. **Geographically, Armenia is divided into 11 *marzs*, including the capital city and 929 communities in 2004.** Two-thirds of Armenia's total population of about 3.2 million resides in the 10 *marzs* outside Yerevan: Aragatzotn, Ararat, Armavir, Gegharkunik, Lori, Kotayk, Shirak, Syunik, Vayots Dzor, and Tavush. The capital city, Yerevan, is home to the rest. Administratively, the Republic of Armenia has only two tiers of government: central and local. There is no *marz* level government. Instead, the central government has regional offices for certain government ministries and agencies in the 10 *marzs* outside of the capital city. At the local level, Armenia is divided into 929 community administrations or local government units. Of these, 59 are urban, including 47 urban communities in the 10 *marzs* outside of Yerevan and 12 districts of Yerevan. The remaining 870 communities are rural. In addition, from the Soviet era, there were 37 regional administrations, which are still used for some administrative functions.

15. **There is a large discrepancy in size among communities**, which range in population from a few hundred to the city of Gumri in Shirak *marz*, with over 150,000 residents. Some of the communities (districts) of Yerevan such as Malatia-Sebastia, North Nork and Shengavit have residents in excess of 140,000. Most of the rural communities are small—more than half of the population lives in settlements with less than 1000 inhabitants and 93 percent of the communities have populations less than 5,000. Yet, all communities, regardless of size and location, have the same power and responsibilities – though not necessarily the same capacities to act on them. All local governments (or "local self-governing bodies") comprise a directly-elected community head, or mayor, and an elected council (the Council of Elders, or *Avakani*), with 5-15 members, depending on the population size of the community.

Methodology

16. **Poverty mapping involves a series of steps that help exploit the strengths of household survey and census population data.** It primarily entails the use of household survey data to estimate poverty or expenditure equation as a function of household characteristics such as household composition, education, occupation housing conditions and asset ownership, and inserting census data on those same household characteristics into the equation to generate poverty estimates for the census households.[7] There are three major stages in poverty mapping: (1) data preparation ('zero stage'), (2) consumption model estimation ('first stage'), and (3) prediction of welfare for census population ('second stage'). The main purpose of 'zero stage' is to select a set of variables that are common in both, in our case, the 2004 Armenia ILCS and the 2001 population census data. In the 'first stage' the subset of variables that are found to have similar distribution in the census and the survey is used to estimate the regression model of per capita consumption. In the 'second stage', the obtained set of parameter estimates from the consumption model is applied to the similarly defined variables in the census to obtain the predicted per capita consumption for each census household. Based on the estimated level of per capita consumption, the estimates of poverty and inequality, as well as their standard errors, are finally calculated at any geographic levels of interest.

Regression Domains

17. **In order to facilitate the comparison of survey and census data and set the stage for first stage regression analysis, we construct 'regression domains' by dividing Armenia into several geographic units**. Regression domains represent the level of geographic disaggregation at which the regression models in the first stage are estimated. Since consumption patterns are likely to vary significantly across the different geographic areas, the consumption model of the relationships between household consumption and determinants of poverty estimated separately for different areas (i.e., regression domains) are likely to provide better estimates. In consultation with the experts of the NSSA with sound knowledge of the geography and living conditions in Armenia, the Republic of Armenia is divided into six regression domains. The division took into account the sampling design of the ILCS, geographic location of the *marzs* and the economic structure of each *marz*. Having only 6 regression domains ensures each regression domain has sufficient number of observations in the 2004 ILCS sample for statistically meaningful regression analysis (see Table 3).

[7] Poverty mapping exercise is based largely on a methodology developed by Elbers, Lanjouw and Lanjouw (2003) (see Annex A for detailed information on this methodology).

Table 3: The sample structure of the 2004 ILCS data and regression domains

Marz	*Marz* Code	Number of Households in the sample			Regression Domain
		Rural	Urban	Total	
Yerevan	101	--	2016	2016	D1
Aragatsotn	102	192	192	384	D2
Armavir	104	192	384	576	D2
Ararat	103	192	384	576	D3
Lori	106	192	384	576	D3
Gegharkunik	105	192	288	480	D4
Shirak	108	192	384	576	D4
Kotayk	107	192	384	576	D5
Sjunik	109	96	288	384	D5
Vayots Dzor	110	96	192	288	D6
Tavush	111	192	192	384	D6

18. **The above division of Armenia into 6 domains, which took into account the sampling design of the 2004 ILCS and relative poverty levels, has been made so as to ensure similarities among *marzs* in a given domain.** When grouping one or more *marzs* together to form a regression domain, we are in principle assuming that the parameter estimates from such regression domain are the same for all households in that particular regression domain. Note however that no urban-rural differences within *marz* were taken into account as the ILCS is not representative for urban and rural areas within the same *marz*. In order to address this, an urban-rural indicator variable and its interaction terms with other correlates of poverty were included in the consumption regressions.

III. GEOGRAPHIC DISTRIBUTION OF POVERTY

Measures of Poverty and Inequality

19. **Before presenting the results of the poverty mapping exercise, the measures of poverty and inequality used in this procedure are briefly described here**. The Foster-Greer-Thorbecke indices, P (α), with the poverty aversion parameter, α, equal to 0, 1, and 2 are used to measure poverty headcount, poverty depth and poverty severity, respectively (Foster, Greer, and Thorbecke, 1984). The Gini coefficient is used to measure consumption inequality. A poverty line of 19,373 drams per adult equivalent per month (in 2004 prices) as established and used in the report "Social Snapshot and Poverty in Armenia" of the World Bank and NSSA is used in calculating the poverty rates. The consumption aggregate has been deflated to account for the regional (*marz* and urban-rural) variations in prices. However, since the main purpose of the poverty mapping exercise is to understand relative poverty in different geographic regions and communities, the choice of poverty line does not affect the relative standing of the geographic units.

Robustness of the Results

20. **The reliability of small area estimation methodology hinges not only on the degree to which it accounts for household heterogeneity, but also for unobserved location effects**. As location effects can greatly reduce the precision of welfare estimates, we have endeavored to address this important variation in our choice and construction of observable variables. We included cluster level (at the community level) variables in the consumption regressions to help explain local effects (see Annex A). As Table 4 below indicates, by so doing, we have successfully minimized the unobserved location effects. The diagnosis of the standard errors demonstrates that the share of the overall variance of the disturbance term that can be attributed to the unobserved location effect is significantly small. The percent of variation attributable to location effects ranges from 0.9 for D2 to about 5.6 for D4 (see Table 4), suggesting that location effects have been appreciably minimized in all regression domains.

Table 4: Unobserved location effects are significantly small.

Regression Domain	Percent of variation attributable to location effects.
D1 (Yerevan)	---
D2(Aragatsotn, Armavir)	0.88
D3 (Ararat, Lori)	0.94
D4 (Gegharkunik, Shirak)	5.62
D5 (Kotayk, Sjunik)	2.85
D6 (Vayots Dzor, Tavush)	*0.20*

Source: Project Team calculations

21. **The robustness of the results of poverty mapping depends on the level of geographic aggregation.** On the ground verification exercise reported below shows that poverty mapping results do not adequately represent the poverty rates at the community level in rural areas, as most rural communities of Armenia tend to be small. However, the results are robust at the next higher level of aggregation, i.e., the *rayons*. Table 4 above has shown that the *rayon* level estimates are quite robust and the error due to location effects is minimal.

Verifications at the Community Level

22. **The poverty mapping team undertook field visits to various communities to verify the poverty numbers estimated at the community level under the poverty mapping exercise with on the ground realities**. Since the consumption model and its parameters estimated at the regression domain level are assumed to apply to all households in the domain regardless of their *marz*, *rayon*, or community, the precision of poverty mapping results may decline when applied to geographic areas smaller than the regression domain at which the model parameters are estimated. Given that most of the rural communities of Armenia are quite small--more than half of the population lives in settlements with less than 1000 inhabitants and 93 percent of the communities have populations less than 5,000—the community level predictions are likely to be unreliable. To verify this, the NSSA and the World Bank poverty mapping team visited as many rural and urban communities as possible to check whether the predictions at the community level are meaningful and closely mimic the underlying realities on the ground. The communities to be visited were selected on the basis of their poverty level (poor as well as rich) according to the poverty mapping results. Accordingly, the team visited 3-4 communities in each of the 7 out of the 10 *Marzs* of Armenia outside the capital Yerevan (Aragatsotn, Ararat, Gegharkunik, Lori, Kotayk, Vayots Dzor and Tavush *marzs*). The team met and discussed with the community leaders, other community workers, and ordinary citizens on the streets to learn their perspectives on the relative standing of their rich (poor) community in comparison to a poor (rich) neighboring community. The following questions were asked and discussed: Why they think their community is richer (poorer) than the comparator community? What are the main economic activities of their community? Do you have easy access to markets and main roads? How is your land size and land quality of your community compared to the other community? And so on. These same steps were followed in the comparison community. The team also sought the community's perspectives on the living conditions of their respective *rayon* in comparison to other *rayons* in the *marz*. The community's views were augmented with the team's own assessments and observations of the conditions on the ground.

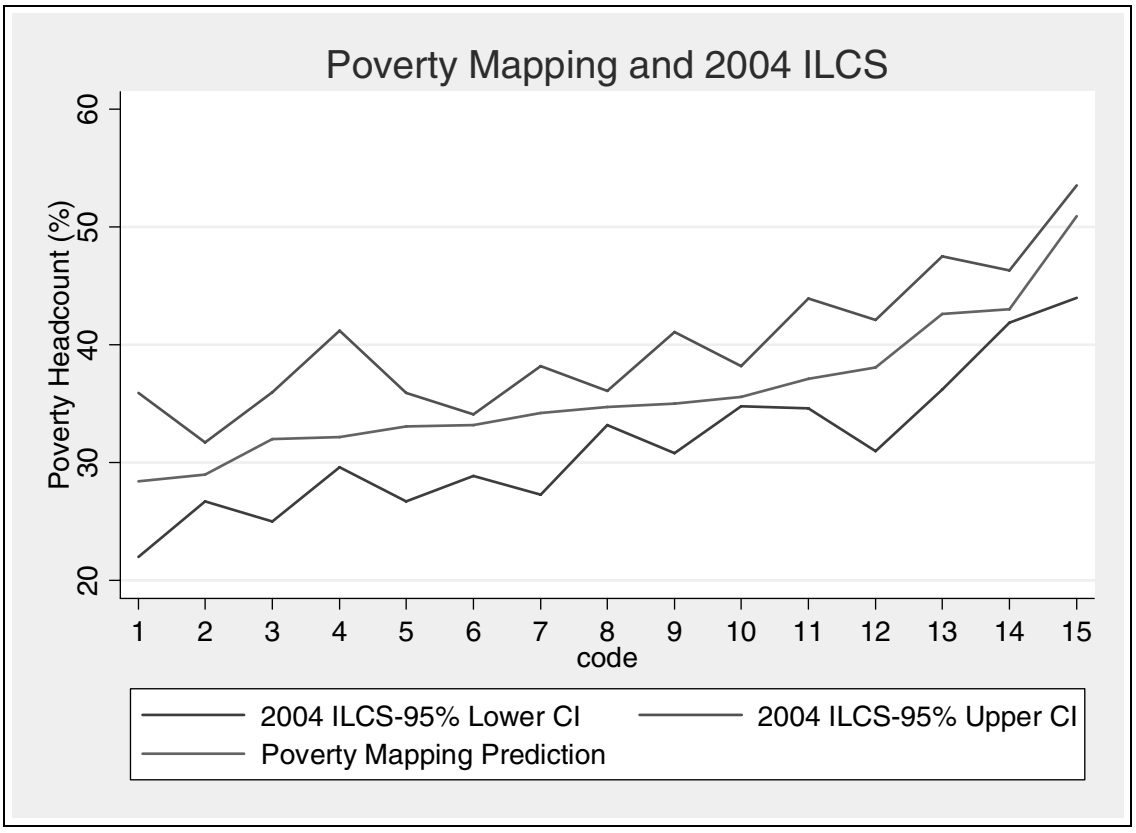
23. **The poverty mapping results for urban communities appear to mimic quite well on the ground realities. However, there was poor matching with the conditions in the rural communities, particularly in those with small population size (less than 3000 people).** Thus, given that most of the rural communities of Armenia are quite small, it is not advisable to report and use the poverty mapping numbers at the community level. However, our estimates at the next higher level of aggregation (old *rayon* or region) are quite robust and supported by on the ground realities. The key finding of the field visits and discussions with the communities themselves is that applying poverty mapping methodology to small geographic areas with correspondingly small population (as is the case for most rural communities in Armenia) will

lead to unreliable estimates. Therefore, in the discussions that follow we report rural poverty and inequality only at the *rayon* level and beyond, except for Yerevan. Since Yerevan communities are relatively large (Nubarashen, the smallest district, has population of about 9000), the predictions are reported for each of the 12 communities (districts) of Yerevan.

Comparing Poverty Estimates from Survey and Poverty Mapping

24. **The poverty mapping estimates of poverty and inequality are statistically identical to those based on the 2004 ILCSurvey data at the geographic level where the survey was representative**. While the report focuses on the predictions of welfare at the level of *rayon*, we also provide estimates for *marzs* as well as for the whole country to compare census based predictions with those estimates that are obtained directly from the 2004 ILCS. Figure 1 presents the national, Yerevan, non-Yerevan urban, rural and *marz* level estimates of poverty and inequality rates predicted by poverty mapping techniques, which combined the 2001 Population Census and 2004 ILCS data. Also reported in the same Figure are corresponding 95 percent confidence intervals of the poverty headcount estimates based on only the 2004 ILCS data. As the 2004 ILCS is representative at these levels of geographic aggregation, the comparison of the survey estimates with those of poverty mapping provide a robustness check for validity of the latter estimates. In all of the geographic classifications the census estimates fall within the 95 percent confidence interval around the ILCS estimates. For example, at the national level, the poverty headcount estimate obtained by combining the census and 2004 ILCS data of 34.7 percent is remarkably identical in magnitude to that obtained from the 2004 ILCS data alone (34.6 percent). Nationally, as compared to the 2004 ILCS estimates, the census based estimates indicate a slightly lower incidence of poverty in rural areas and a slightly higher incidence of poverty for urban areas overall, but none of these show statistically significant differences.

Figure 1: Poverty mapping predictions lie within 95% confidence intervals of the 2004 ILCS poverty headcount



Notes: Code 1 refers to Vayots Dzor, 2-Yerevan, 3-Tavush, 4-Aragatsotn, 5-Lori, 6-Rural, 7-Ararat, 8-Armenia, 9-Armavir, 10-Urban, 11-Kotayk, 12-Sjunik, 13-Gegharkunik, 14-Other Urban, 15-Shirak.

25. **At the *marz* level, all estimates of the poverty mapping exercise lie within the 95 percent confidence interval of the 2004 ILCS sample mean**. Census predictions are slightly larger than survey estimates in 7 out of the 10 *marzs*, which is to be expected as the poverty mapping combines the census data of 2001, when poverty was higher than it was in 2004. However, the differences are not statistically significant. On the other hand, poverty rates based on the 2004 ILCS appear slightly higher than census predictions in the remaining three *marzs*: Aragatsotn, Armavir, and Kotayk. However, here again, the differences are not statistically significant. The similarities observed between the two estimates at the level of aggregation where the survey is representative such as at national, Yerevan, non-Yerevan urban, rural and *marz* levels, along with the universal coverage of the census data, support the conclusion that the poverty mapping provides reliable estimates of poverty and inequality in Armenia in 2004. As a result, the report argues that the census predictions of poverty and inequality at the *rayon* level, together with on the ground verifications, provide useful information to identify and rank localities by the degree of their deprivation.

26. **The *rayon* level census-based estimates of poverty are quite robust, with most of them statistically significant at a 99 percent level of significance.** The census-based estimates of

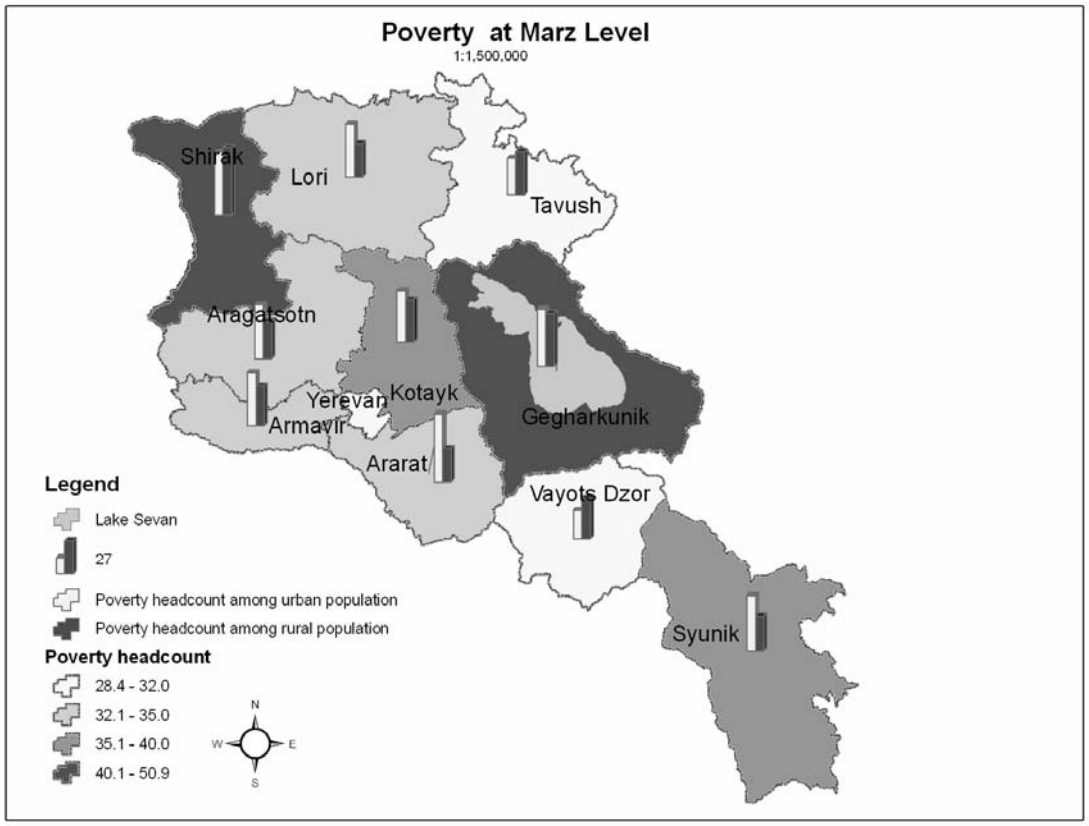
poverty and inequality and their standard errors by *marz*, *rayons* within *marz*, and urban and rural areas within *rayons* are reported in Annex C. The ranking of the *rayons* by poverty headcount is reported in Annex D. Visual maps of poverty and inequality can be found in the following sections.

Distribution of Welfare across *Marzs*

27. According to the census predictions, **spatial disparities in poverty in Armenia are large.** Figure 2 below shows poverty rates across the various *marzs* and the urban and rural areas within each *marz* in 2004. We observe a substantial variation in the standards of living across Armenia: The *marz*-level census-based estimates of poverty headcount vary from about 28.4 percent for Vayots Dzor and 29.0 for Yerevan to 50.9 percent in Shirak *marz*. The findings of the poverty mapping exercise thus indicate that Shirak *marz* with its poverty rate of 50.9 is by far the poorest of all. Yerevan and Vayots Dzor are, on the other hand, the richest. In the rest of the *marzs*, poverty headcount rates range from 32 percent in Tavush to 42.6 percent in Gegharkunik. These observations based on the poverty mapping exercise agree with those based on the survey data.

28. **Nationally, rural areas, where approximately 1.2 million Armenians live, have about one-third of their population below the poverty line in 2004, according to the census predictions**. Urban areas are slightly poorer than rural areas, particularly due to the high rate of poverty incidence (43.0 percent) in non-Yerevan urban areas.

Figure 2: Spatial disparities in poverty in Armenia are large



Urban and Rural Dimensions of Poverty

29. **Differences in living standards are more magnified when looking at the urban and rural areas.** While the ILCS data does not allow urban-rural disaggregation beyond the national level, the poverty mapping allows estimating the extent of rural and urban poverty at the levels of *marz* and *rayon*. With this disaggregated estimates, we can make several major observations regarding the distribution of poverty in the urban-rural continuum within the *marzs* and *rayons*. The findings indicate that urban areas in Ararat and Shirak *marzs* have close to or over 50 percent of their population below the poverty line, compared to only about 22 percent in the urban areas of Vayots Dzor (Figure 2). Similarly rural areas of Shirak faced over 53 percent of poverty headcount in 2004, compared to only 26 percent rural poverty in Lori.

30. **The decomposition of *marz* poverty into urban and rural areas shows that in seven *marzs* urban areas were worse off than their rural hinterlands in 2004, while the reverse is true in three remaining *marzs***. Urban areas of Aragatsotn, Ararat, Armavir, Gegharkunik, Lori, Kotayk and Sjunik are significantly poorer than their corresponding rural areas. On the other hand, rural areas of Shirak, Vayots Dzor and Tavush faced a higher risk of poverty compared to their respective urban areas. As can be seen from Table 5, there is a substantial variability in the poverty rates between urban and rural areas of any given *marz*. The urban-rural disparity in poverty is nowhere more magnified than in Ararat, Lori, and Sjunik *marzs* where all urban areas faced higher than the national average risk of poverty. Similarly, more than two-thirds of urban communities in Armavir and Kotayk were poorer than an average Armenian household. It is important to note that these differences usually get masked when all urban areas of the country are lumped together with no regard for geographic heterogeneity, which has been the case for Armenia where poverty measurements are based on household surveys that are not representative for urban and rural areas except at the national level.

Table 5: Urban-rural differentials in poverty are substantial.

	Rural	Urban	Difference
Armenia	33.2	35.6	-2.2
Aragatsotn	29.3	42.1	-12.8
Ararat	26.4	53.0	-26.6
Armavir	31.5	41.4	-9.9
Gegharkunik	41.5	44.8	-3.3
Lori	26.0	41.2	-15.2
Kotayk	33.0	40.0	-7
Shirak	53.1	49.4	3.7
Sjunik	27.3	43.2	-15.9
Vayots Dzor	31.7	22.2	9.5
Tavush	33.9	28.8	5.1

Poverty at the *Rayon* Level

31. The *rayon* poverty map below shows that *rayons* with severe deprivation are not just concentrated in one part of the country, but are rather dispersed throughout the country. Pockets of high poverty exist in even relatively better off *marzs* such as Tavush, where 1 out of the 3 *rayons* faced poverty incidence of 42 percent or more, which was much higher than the national average poverty rate of less than 35 percent in 2004 (Figure 3). In Shirak, 3 out of the 4 *rayons* faced poverty rates of 42 percent or more. Similarly 3 out of the 6 *rayons* in Gegharkunik *marz* were extremely poor. Except for Vayots Dzor and Tavush *marzs*, all other *marzs* in Armenia had at least one *rayon* with higher than the national average rate of poverty (Table 6). Similarly, except for 3 *marzs* (Ararat, Armavir and Vayots Dzor), all other *marzs* had at least one *rayon* facing higher than the national average rate of poverty.

Figure 3: Pockets of high poverty rates are widespread in Armenia

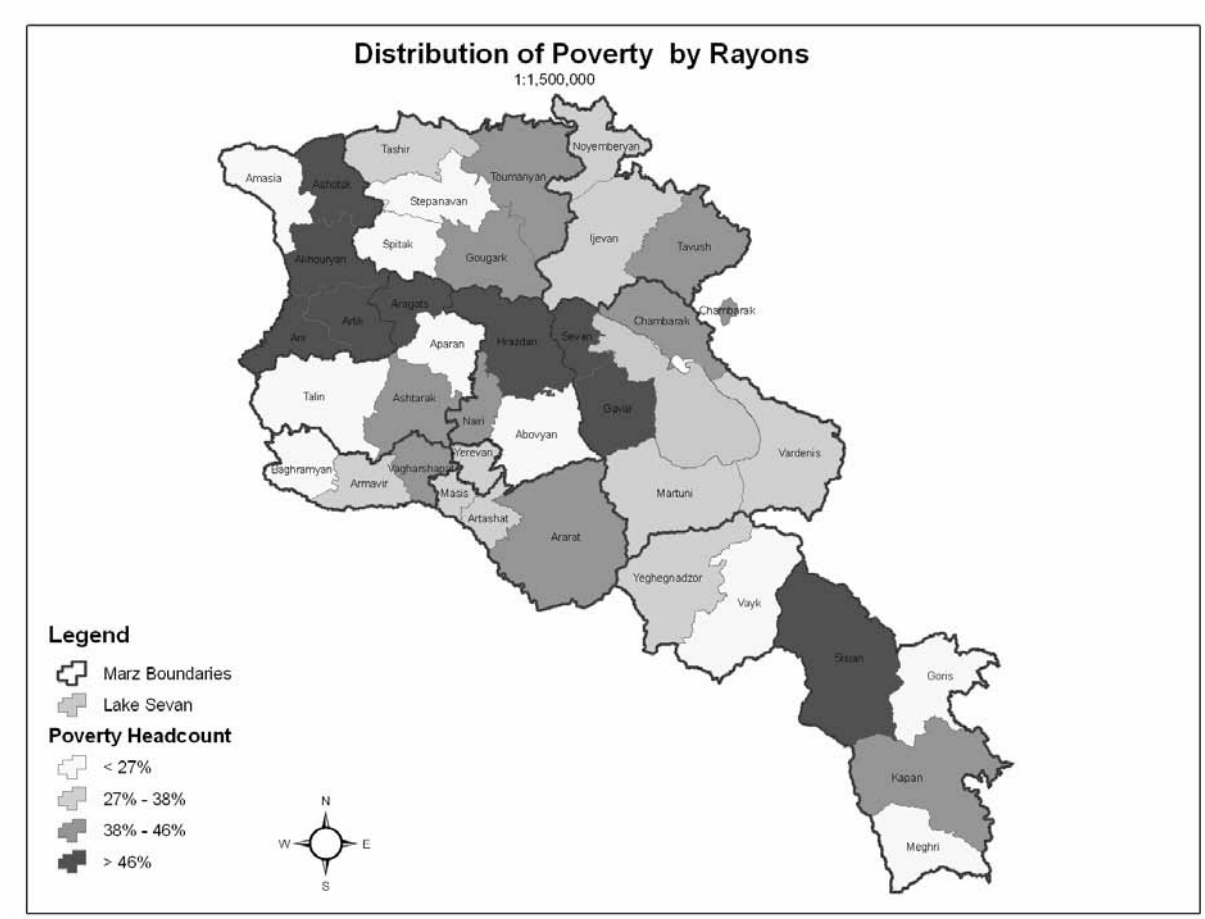


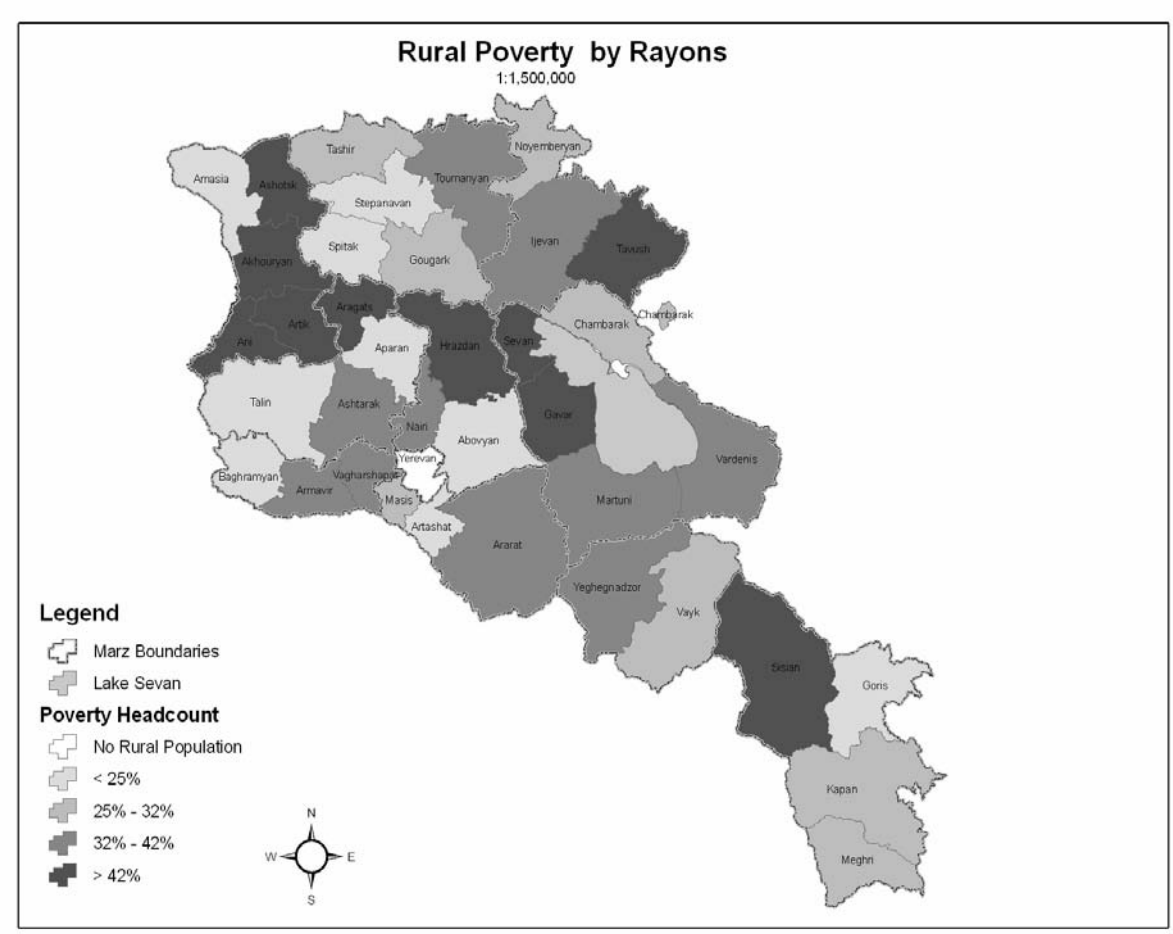
Table 6: Number of *rayons* with higher than the national rate of poverty

	Total number of *rayons*		Number of *rayons* with higher than national rate poverty		Proportion of *rayons* with higher than national rate poverty (%)	
	Urban	Rural	Urban	Rural	Urban	Rural
Yerevan	12	0	3	--	25	--
Aragatsotn	3	4	1	1	33.3	25
Ararat	3	3	3	0	100	0
Armavir	2	3	1	0	50	0
Gegharkunik	5	5	5	3	100	60
Lori	5	5	4	1	80	20
Kotayk	3	3	2	2	66.7	66.7
Shirak	3	5	3	4	100	80
Sjunik	4	4	2	1	50	25
Vayots Dzor	2	2	0	0	0	0
Tavush	3	3	0	1	0	25

Rural Poverty at the *Rayon* Level

32. Similar observations can be made by looking only at the rural areas of the 37 *rayons* of Armenia, although most deprived rural *rayons* tend to be concentrated in Shirak and Gegharkunik *marzs*, severe deprivation was commonplace in other *marzs* as well (Figure 4 below). In Tavush, one of the better off *marzs*, Tavush *rayon* appeared to face much higher than the national average risk of poverty. Rural areas of the Shirak *marz* were worse off as 3 out of the 4 rural *rayons* faced poverty rates of 42 percent or more.

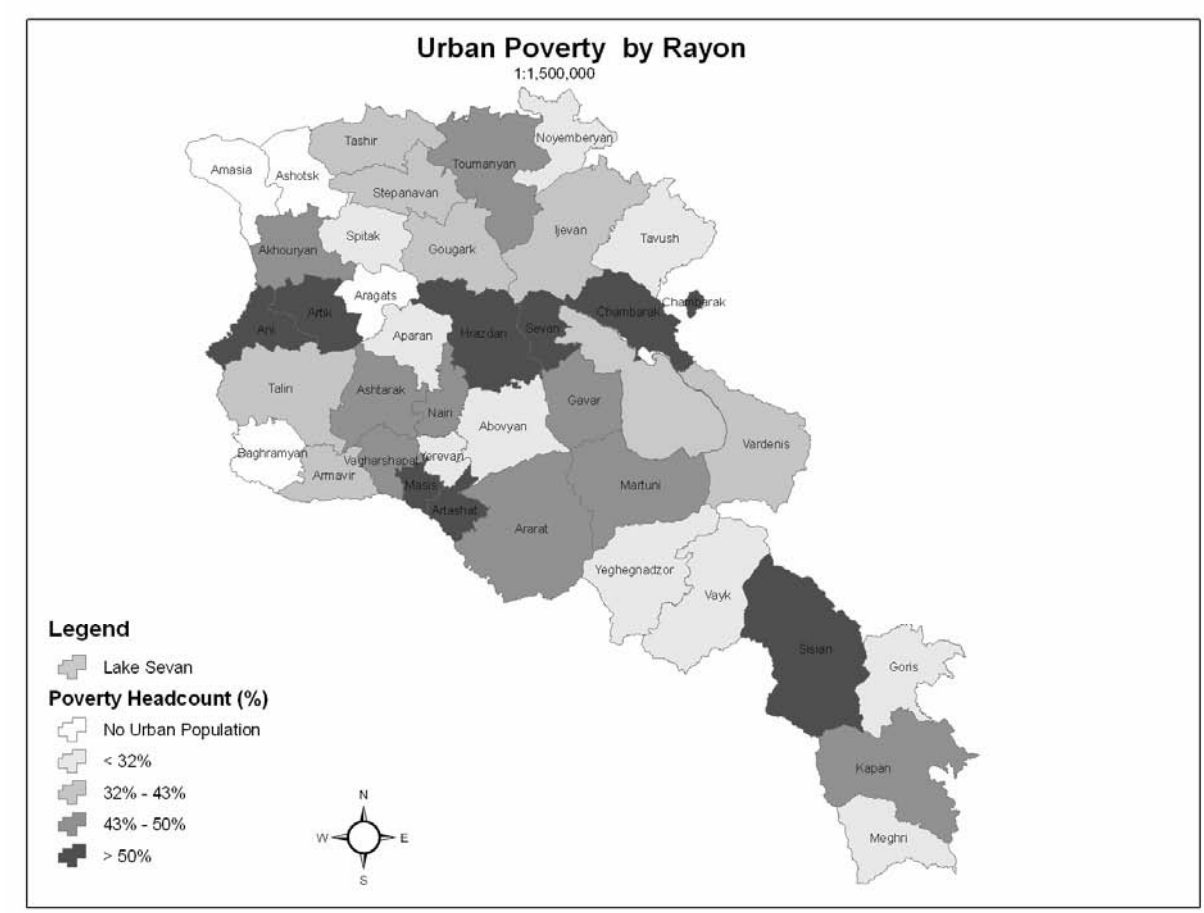
Figure 4: Poverty among Rural *Rayons*



Urban Poverty at the *Rayon* Level

33. Close examination of poverty at the *rayon* level within the *marzs* also indicates a varied picture (Figure 4 and Figure 5). Urban areas of Ani and Karmir *rayons*, in Shirak and Gegharkunik *marzs*, respectively, had poverty rates in excess of 60 percent in 2004. Similarly, Akhouryan *rayon* in Shirak *marz*, which does not have urban population, faced over 60 percent of poverty incidence. Only very few *rayons* with urban communities outside Yerevan (4 out of 34) had poverty rate less than 25 percent, compared to 11 out of 37 rural *rayons* enjoying less than 25 percent incidence of poverty. Moreover, 14 of the 34 *rayons* with urban communities faced poverty incidence of over 45 percent compared to only 8 of the 37 rural *rayons*. These differences suggest that development and poverty reduction programs that are designed, implemented and evaluated on the basis of overall urban-rural differences in poverty incidence, even within the same *marz*, may not be as effective in addressing pockets of deep poverty in either rural or urban areas.

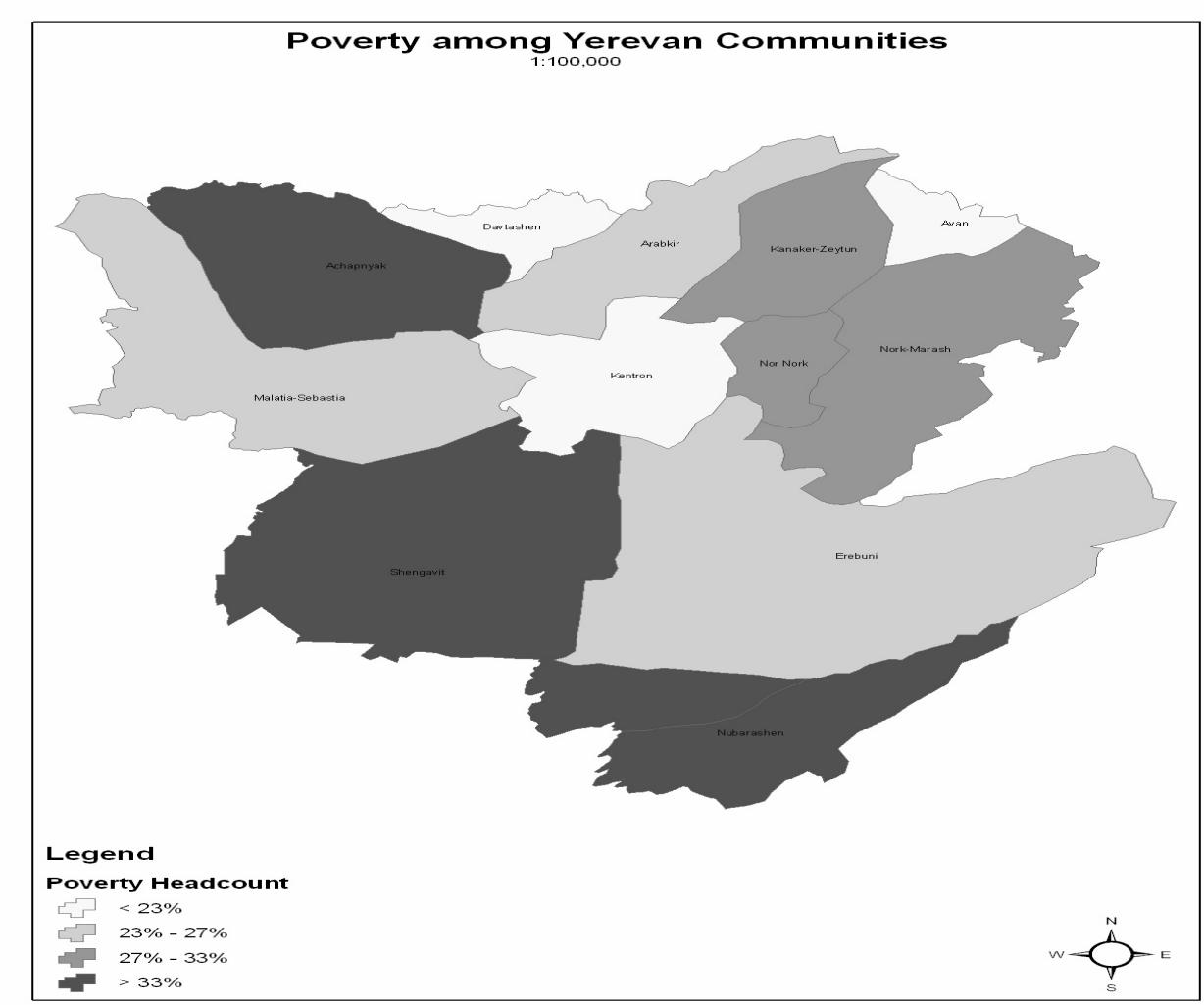
Figure 5: Poverty among urban communities within *marz*



Poverty among Yerevan Communities

34. For the capital city of Yerevan, where communities are large, poverty mapping results are reported at the community level. Three out of the 12 communities (districts) of Yerevan faced higher than the national average poverty incidence (Figure 6). Only one *rayon* in Yerevan faced poverty incidence of more than 45 percent. Kentron appeared to be the least poor district in Yerevan, while Shengavit, Adjapnyak and Nubarashen were the poorest.

Figure 6: Estimate of poverty rates among Yerevan districts

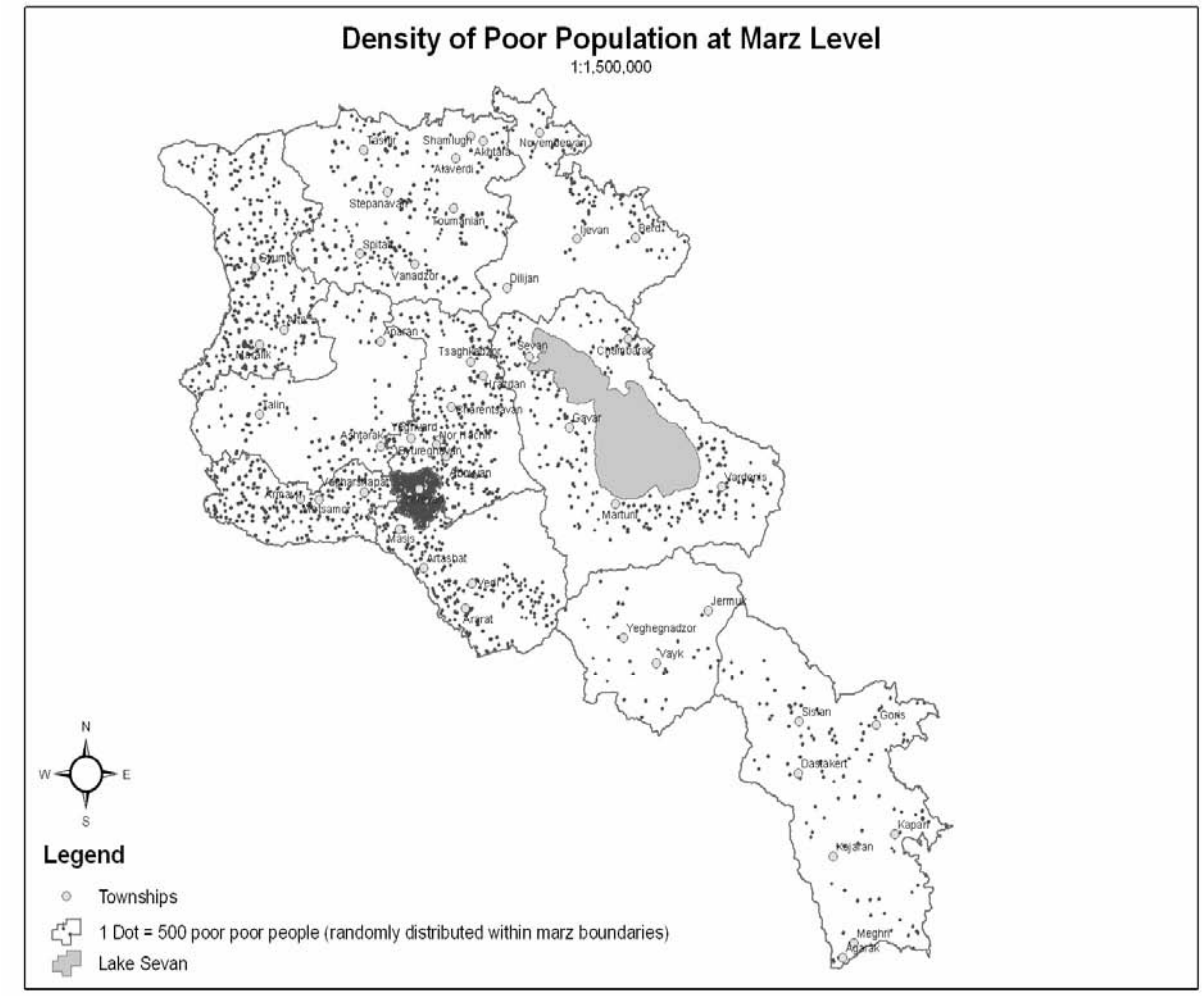


Poverty Incidence and Absolute Number of Poor

35. **The results of poverty mapping successfully indicate where pockets of severe poverty remain in Armenia**, and provide interesting insights on the risk and magnitude of poverty. However, high headcount ratios do not always show a large absolute number of poor in a given geographic area, since this depends on the total population and the poverty headcount ratio. Figure 7 illustrates this fact clearly: even though the headcount ratio is low in some *rayons*, the number of poor people is high, especially in Yerevan city areas, due to the large population. On other hand, some communities have high headcount ratios, but lesser numbers of poor people due to the low density of population. For example, the largest number of poor people is found in Yerevan, although the Shirak *marz* is the poorest of all. In general, poverty incidence as measured by the percentage of population is higher in remote rural areas, while the absolute number of the poor is larger in urban areas. This illustrates the danger of relying only on the poverty headcount index in designing poverty alleviation programs. Targeting all anti-poverty programs to the poor *marzs* with no regard to the absolute number of poor people will run the risk of missing large numbers

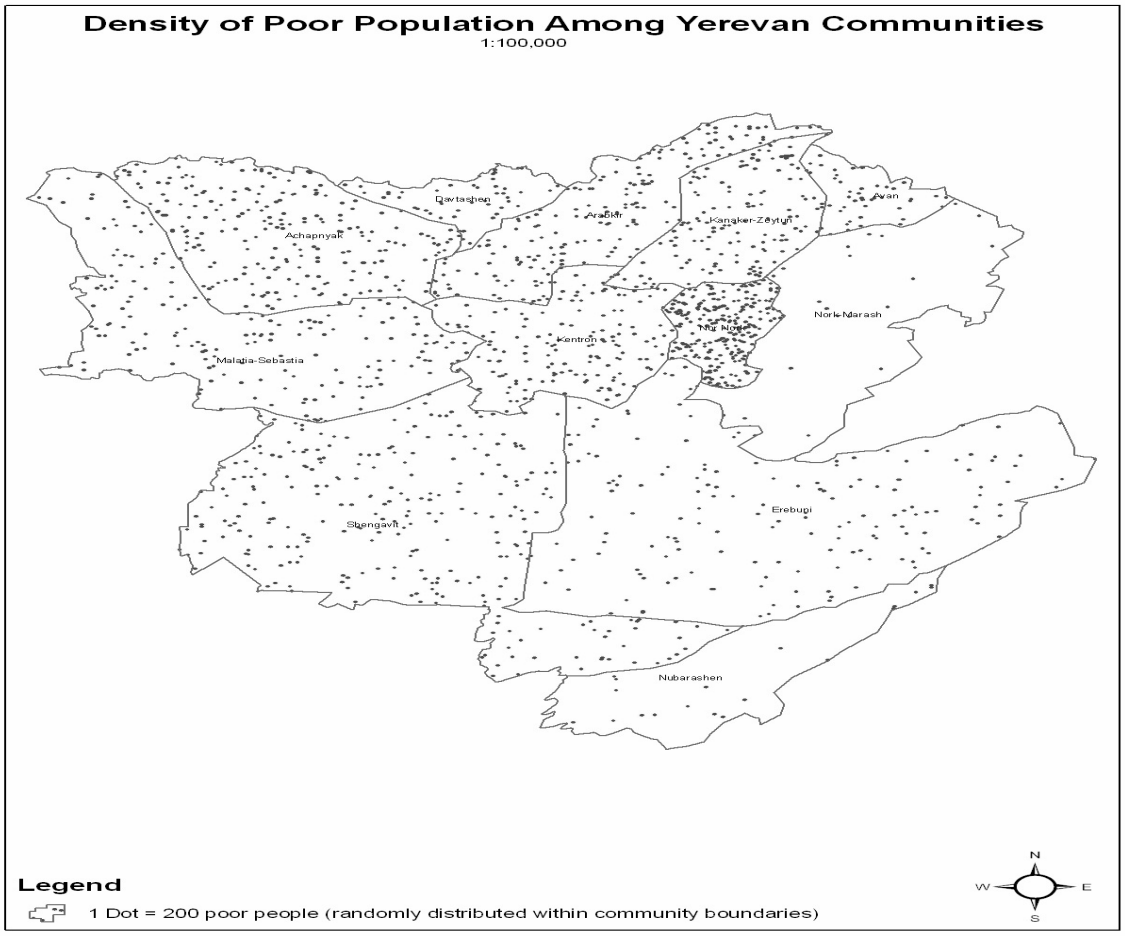
of the poor in *marzs* and communities that are better-off on average, including those in the capital city.

Figure 7: Areas with high poverty rates are not necessarily areas with the largest number of poor



36. A further look at the map of the concentration of poor population shows significant variation within Yerevan itself (Figure 8). Nor Nork district has the highest density of poor among Yerevan communities.

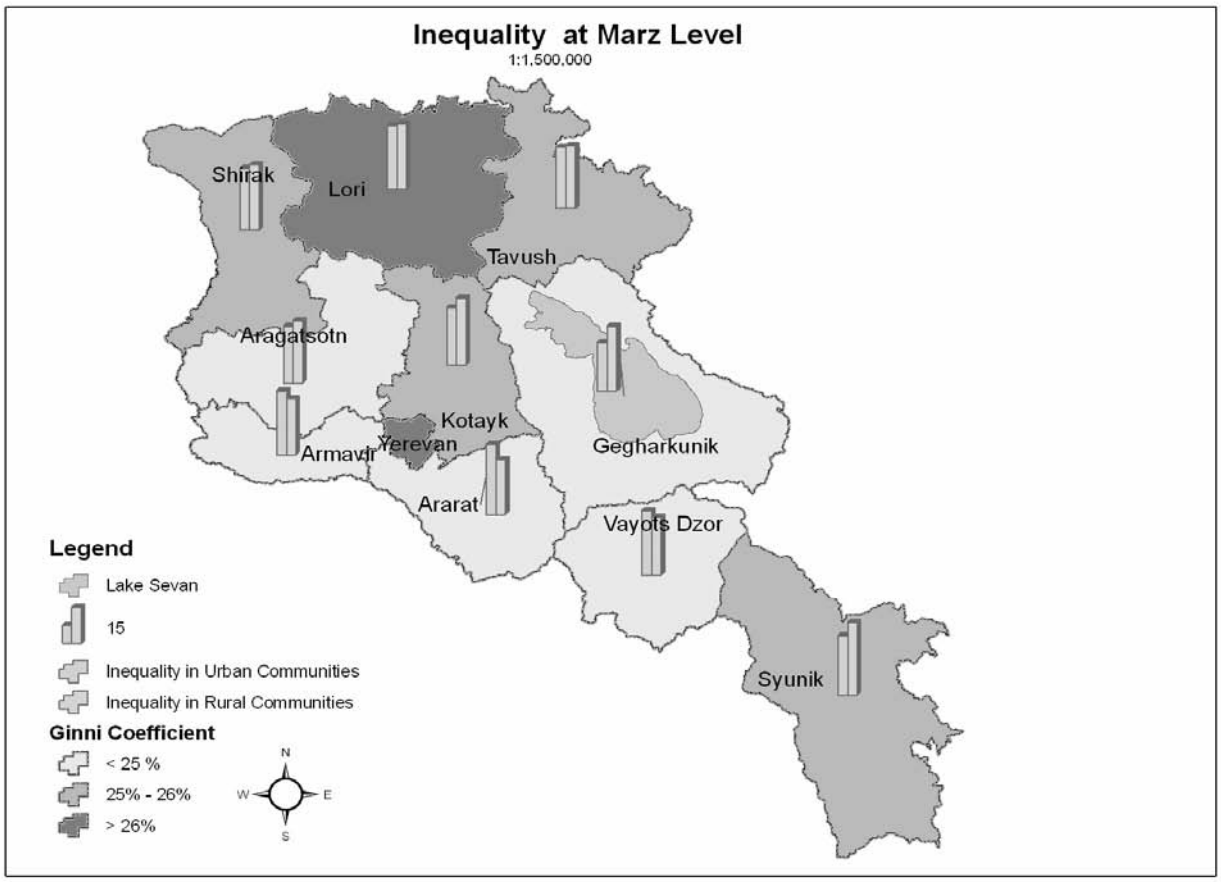
Figure 8: Density of poor population in Yerevan



Inequality in consumption distribution in Armenia

37. **Inequality in Armenia is quite modest compared to other countries in the CIS**. Gini coefficients from both the ILCS and the poverty mapping exercise are quite comparable, reinforcing the robustness of the poverty mapping results. Yerevan exhibited the highest rate of inequality in both survey and census estimates, followed by other urban areas. The non-Yerevan urban areas are relatively less unequal with a census Gini coefficient of about 24.8 percent, compared to 28.3 percent in Yerevan, 25.3 for rural areas and 26.2 percent for the whole country (Figure 9). The inequality estimates suggest that urban areas exhibit slightly more consumption disparity than rural areas. In rural areas, the Gini coefficient ranges from 22.4 percent in Ararat to 29.7 percent in Sjunik. In urban areas, it ranges from 19.8 in Gegharkunik to 28.6 in Ararat.

Figure 9: Yerevan and Lori exhibit higher rate of inequality than the rest of the *marzs*



IV. MAPS OF POVERTY AND ITS CORRELATES

38. The poverty mapping exercise shows the distribution of poverty and inequality in consumption expenditures, **but additional tools are needed to identify the reasons for the observed levels of deprivation**. In order to make the findings relevant for policy and poverty-reducing interventions, it is important to look at determinants and correlates of poverty. Certain geographic regions or communities may be poor because of many factors: low quality of public services, particularly in education and health, may impede the accumulation of human capital and thus earning capacity; the poor condition of rural infrastructure can limit trade and retard local investment and growth (e.g., Binswanger, Khandker, and Rosenzweig 1993); low level of social capital in poor communities may slow the diffusion and adoption of new farm technologies, thus reducing farmers' earning capacity (e.g., Foster and Rosenzweig 1995); distance from urban centers often inhibits trade, specialization in production and access to credit; and others. The simultaneous plotting of such information on maps—alongside the poverty maps—can be useful to examine the spatial distribution of poverty and some of these factors in Armenia.

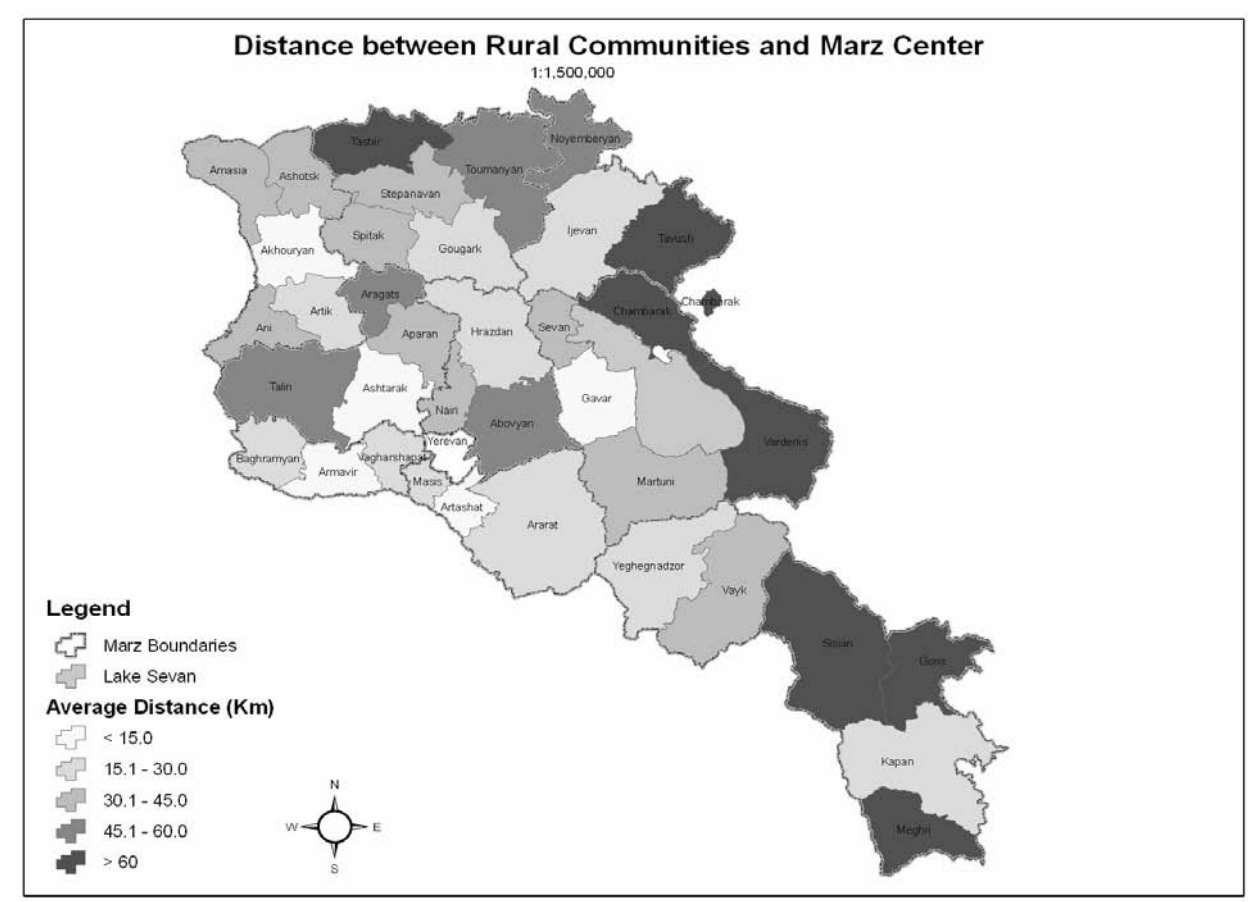
39. In this section, several maps of the correlates of poverty are presented. Maps of various local factors such as elevation, road network, size and quality of arable land, livestock ownership, duration of winter and summer seasons, share of internally displaced and refugee population, unemployment rate, educational level and other variables are therefore presented alongside with local poverty maps. The poverty maps reported previously could be overlaid against these maps to indicate the overlap between poverty and the extent of these characteristics. These maps encourage visual comparison and make it easy to look for spatial trends, clusters, or other patterns. The main findings of this exercise are presented below.

Poverty and Accessibility

40. **Studies show that access to markets and road affect a region's likelihood of being poor or not.** Highways and local road networks are the main means of transportation for Armenians. More than 46% of passenger transportation and more than 76% of cargo freight are done by road (World Bank, 2005). As the main economic activities of the people, particularly in the rural communities, include trading, agricultural production, and selling of agricultural products, buying of agricultural and industrial goods from neighboring communities and other regions, access to road networks and communication infrastructure are critical. This exercise will shed light on the implications of access to road network and town centers for poverty. Poverty maps are overlaid with maps of distance to a main road, and average distance of communities from main local markets, *marz* and former regional centers, as many of the common economic and social activities of the local rural population are mainly confined to these centers.

41. Figure 10 shows the distance from rural communities to *marz* centers.[8] As the *marz* centers tend to have better access to main roads and are where major markets are located, rural areas farther away from these centers appear to be become geographic poverty traps with limited opportunities. The comparison between accessibility to towns and markets and poverty headcount maps thus clearly shows that rural poverty in Armenia is closely associated with geographical isolation. Regions with limited access to markets and intercommunity roads and roads connecting their communities to a main road tend to be poorer than those with close proximity to the *marz* and *rayon* centers.

Figure 10: Proximity to *marz* center is generally associated with low poverty

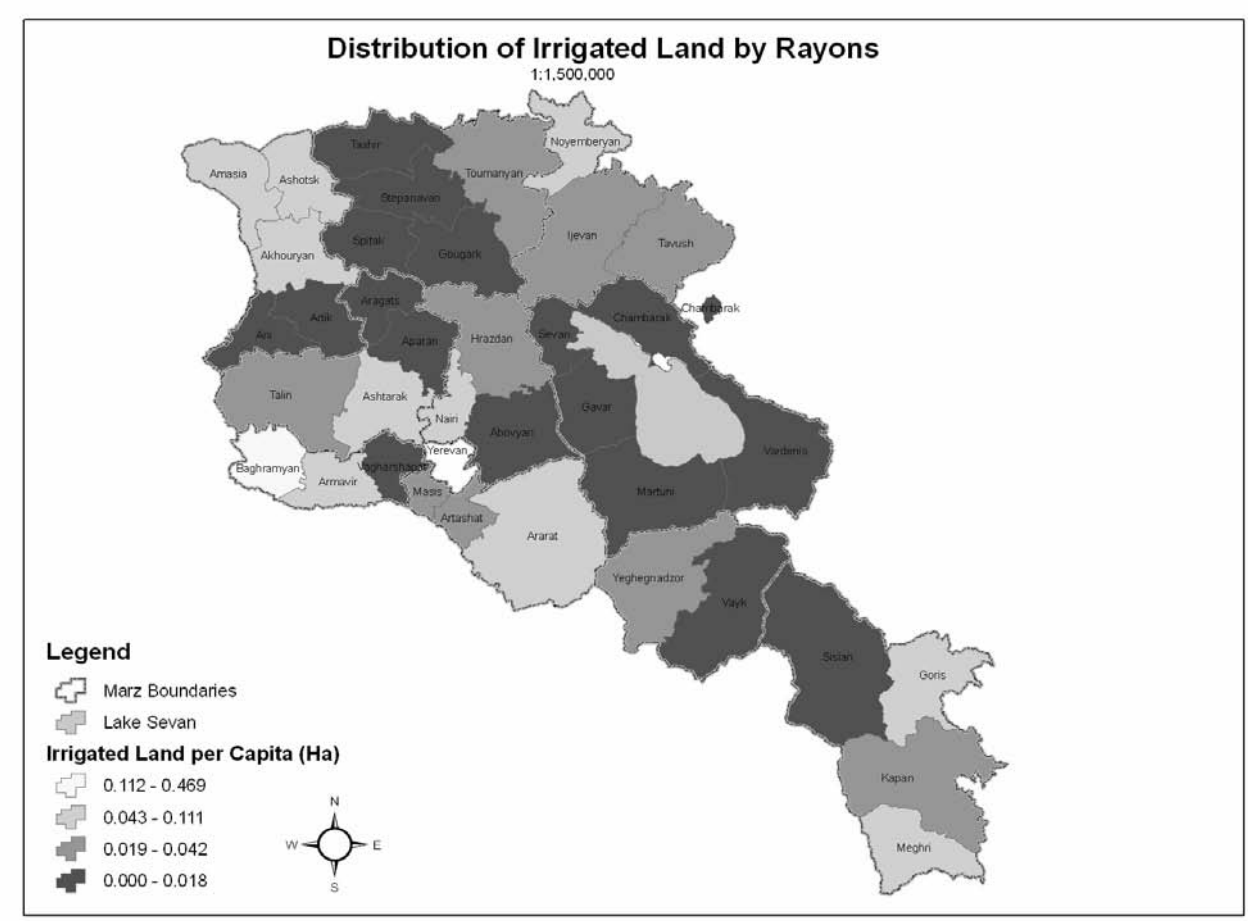


Poverty and Irrigation

42. Figure 11 below indicates that availability of irrigated land is an important correlate of poverty in Armenia. For instance, Ararat, Artashat and Masis *rayons* in Ararat *marz* and Goris *rayon* in Sjunik *marz*, which have relatively large irrigated land per capita, faced lower incidence of rural poverty.

[8] Additional maps of access can be found in Annex D.

Figure 11: Availability of irrigable land is generally associated with low poverty



Poverty and Elevation

A close examination of elevation and poverty maps of Armenia suggests that extremely high elevation communities tend to be extremely poor. Elevation in Armenia varies significantly, ranging from 450 to 2300 meters above the sea level. As the climatic conditions on the ground and access to transport and communication networks are related to elevation, it is reasonable to expect that elevation has implications for poverty. Figure 12 presents the average elevations at the community level in Armenia. For example, most *rayons* in Gegharkunik *marz*, Ashtsk in Shirak *marz* and Aragts in Aragartson *marz* have elevations above 2000 meters with corresponding poverty rates of over 42 percent.[9] Those *rayons* in the medium or low elevation ranges, which tend to be favorable for multi-cropping seasons per year (e.g., Ararat in Ararat *marz*) or tourist attractions (e.g., Ijevan in Tavush *marz*), have relatively low incidence of poverty. Similarly, longer duration of summer season is associated with less incidence of poverty (Figure 13). For example, the two poorest *marzs* (Shirak and Gegharkunik) have on average the least number of summer days per annum.

[9] 120 out of the 870 rural communities in Armenia are located at elevation of at least 2000 meters above the sea level.

Figure 12: High elevation areas appear poorer than the rest

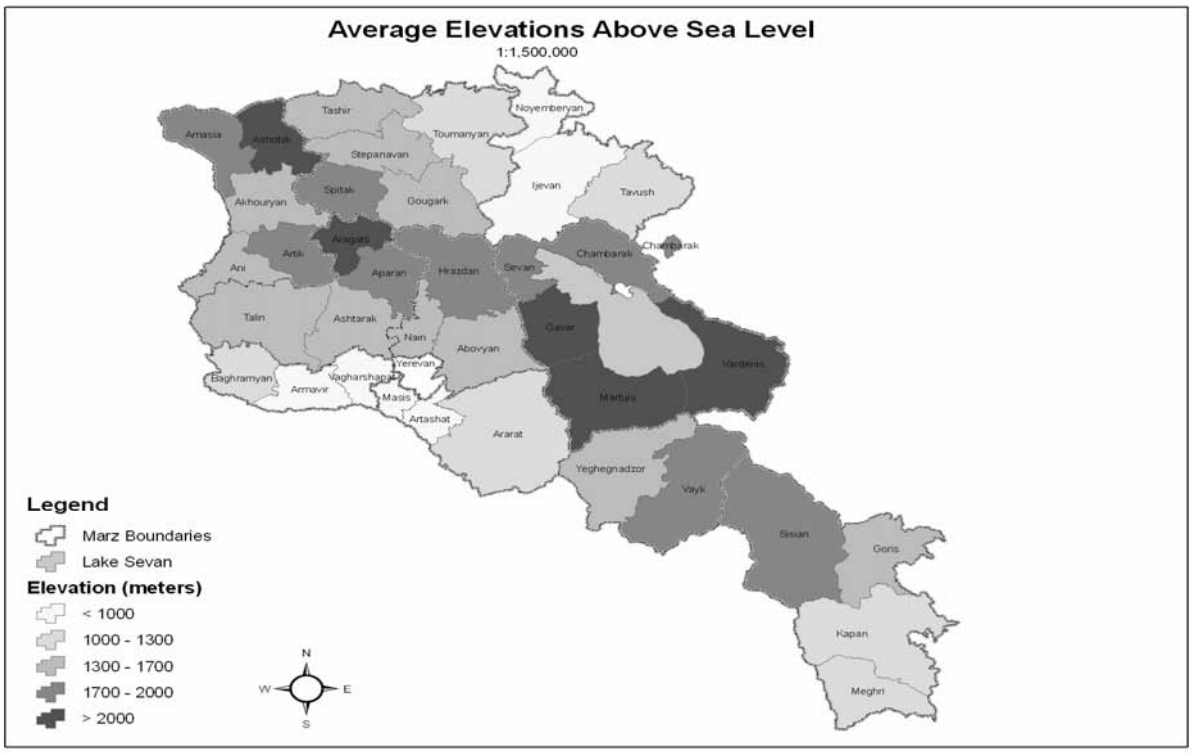
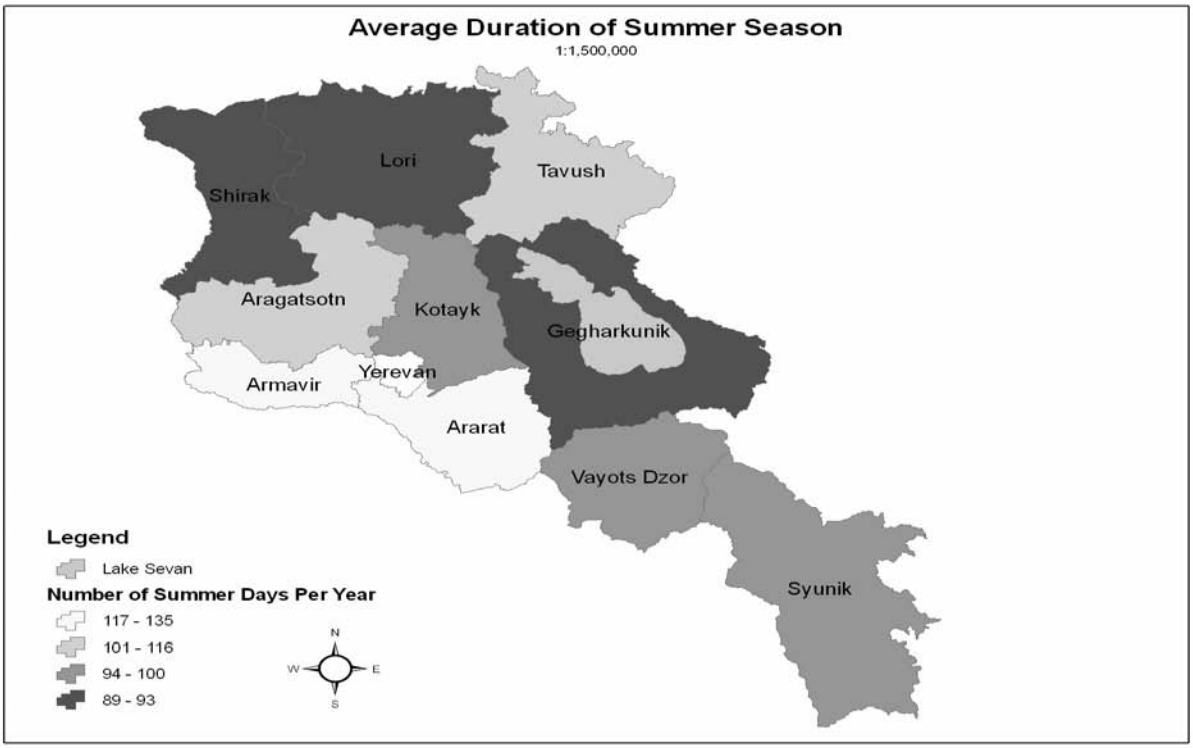


Figure 13: Longer summer duration is correlated with lower poverty incidence

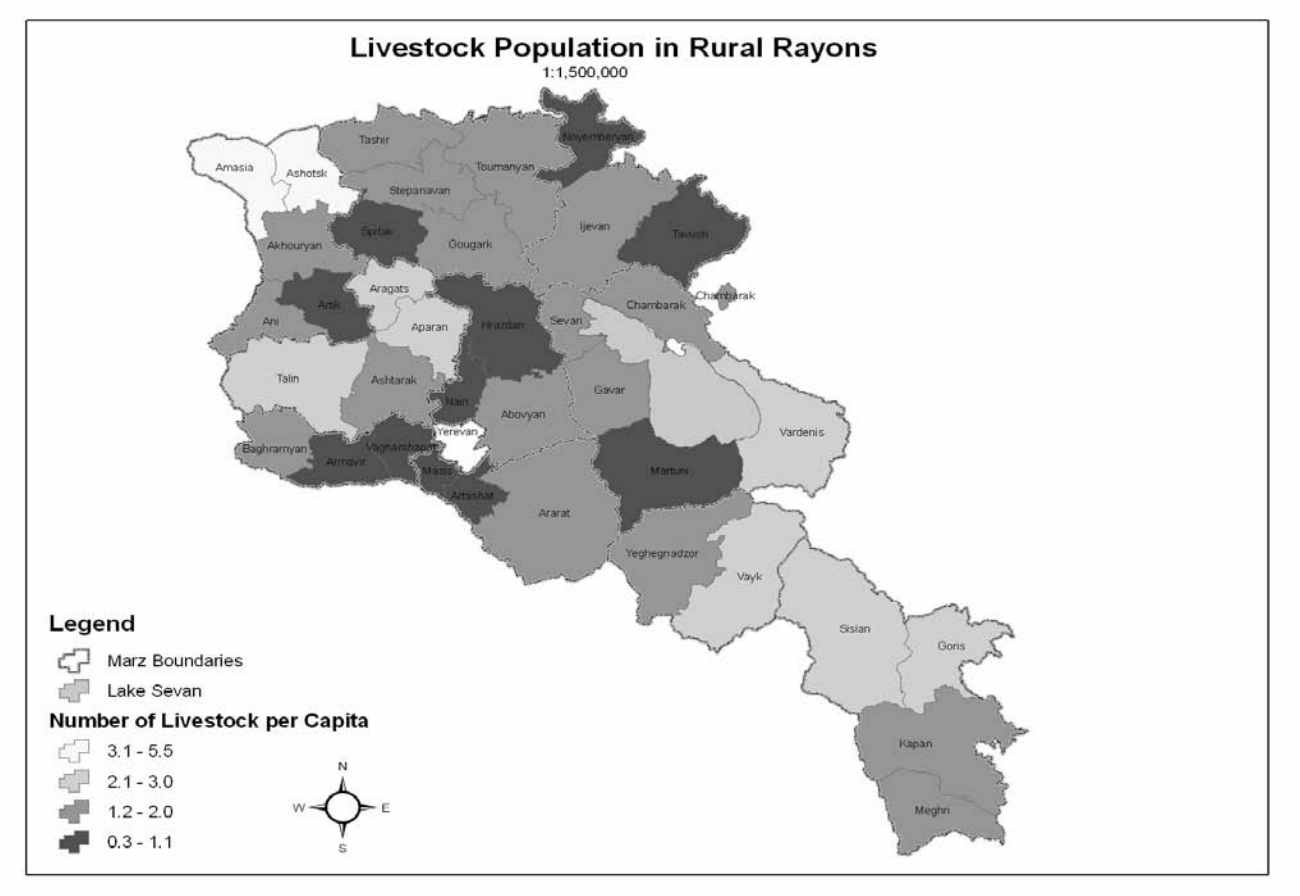


Livestock Population and Poverty

43. **Livestock is often associated with wealth and an estimated 70 percent of the world's rural population depends on livestock as part of their livelihood (World Bank, 2001).** In Armenia, as in other developing countries, livestock is an important asset. So far, there has been little evidence on how livestock ownership affects the likelihood of poverty both spatially and temporally. Using International Fund for Agricultural Development (IFAD) data of 2003, data on livestock per capita was mapped and its correlation with the poverty maps was examined.

44. **The livestock map below (Figure 14) suggests that rural areas with large number of livestock per capita, on average, appear to face less risk of poverty**. Studies on the Armenia livestock sector (e.g., World Bank, 2005b) show that Armenian origin meat products are of high demand in the CIS and Middle East export markets. The most noticeable of these export markets is Russia. The evidence from the poverty maps and such studies show the relationship between livestock holdings and poverty.

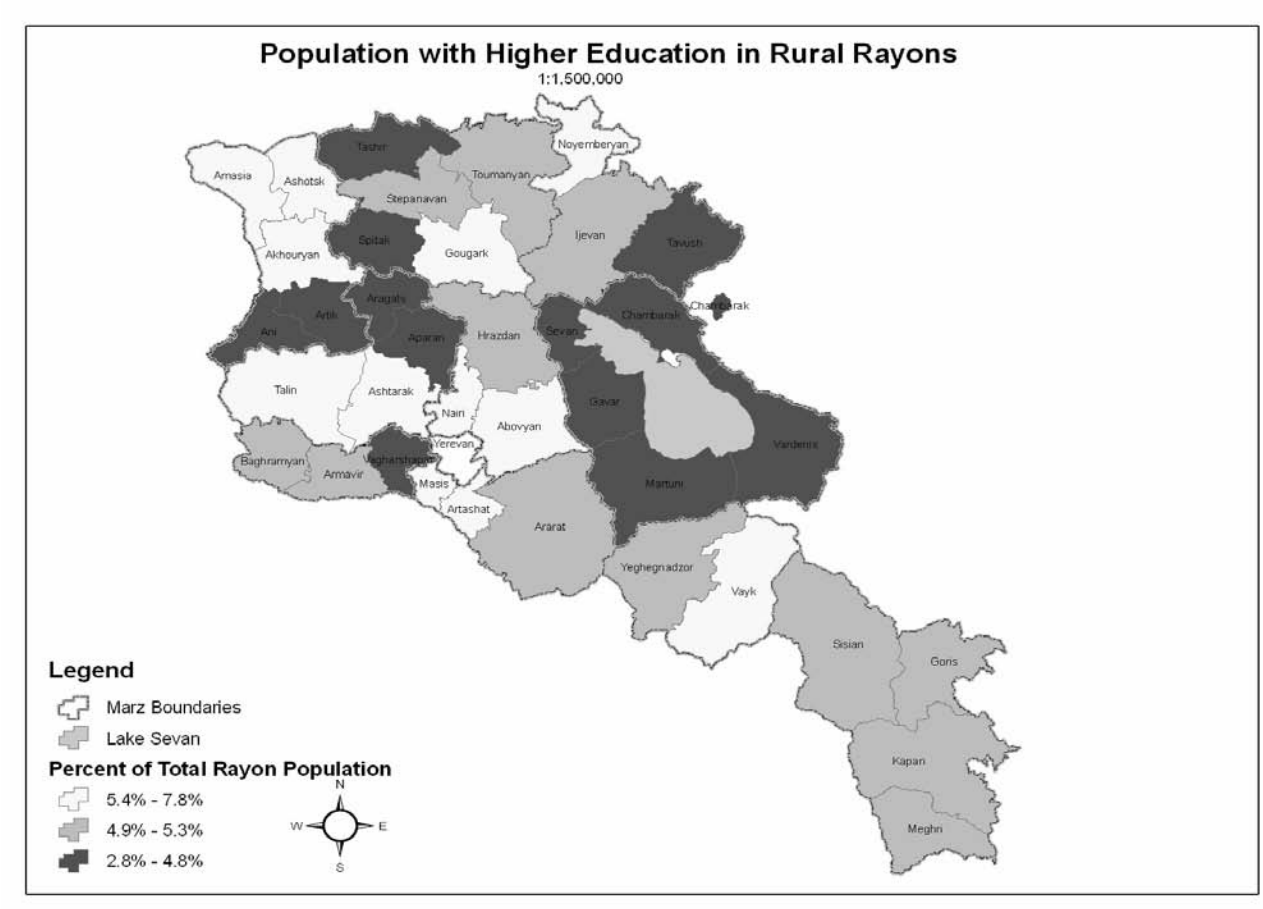
Figure 14: Livestock sector contributes to poverty alleviations



Poverty and Education

45. ***Rayons* with higher percentage of their population with higher education appear to enjoy better living standard, as expected**. Previous analysis of poverty in Armenia emphasized the welfare gains from education: non-poor households have higher levels of educational attainment than do poor ones (especially in post-primary education), and welfare gains have been associated with higher educational attainment. Here the poverty mapping exercise brings additional evidence on the link between educational level and poverty at the regional level. As the map below (Figure 15) shows level of education at the *rayon* level, particularly higher education, is strongly correlated with poverty.

Figure 15: *Rayons* with higher percentage of its population with higher education enjoy better living standard



V. CAPACITY BUILDING

46. **Capacity building was one of the key components of the Armenia Programmatic Poverty Assessment work**. The poverty mapping exercise, which is part of the Armenia Programmatic Poverty Assessment work, made an effort to incorporate this poverty mapping into NSSA's regular poverty monitoring framework. This has been achieved by training and equipping the NSSA staff to enable them not only to produce the current poverty maps but also to repeat this exercise when data from the next round of census and/or suitable household survey become available. In order to ensure the sustainability of the poverty mapping and its proper use without technical assistance from outside and that the current poverty mapping exercise does not end up as a one-shot exercise, training was provided by a World Bank expert on the poverty mapping exercise. Various steps of poverty mapping exercise, including the construction of common variables between survey and census; cluster-specific variables; selection of optimal consumption models; and distributions of cluster and household specific errors, and mapping poverty and other geo-referenced information, were covered during the training. The training employed a user friendly poverty mapping software (POVMAP2) developed by the Research Department of the World Bank. The software has automated many of the completed and lengthy poverty mapping exercise that eased trainings significantly.

47. **The poverty mapping work has led to the development of the first digital map of Armenia with community boundaries**, which is essential to overlay the first poverty statistics at the community level. Until now, Armenia did not have a digital map at the community level. The digital map is also used to conduct simulations to estimate average distance or time to reach main roads and infrastructure, the results of which are illustrated in the above section.

48. **A series of dissemination workshops are planned to disseminate the findings and gain support for sustaining the poverty maps and for expanding the community of users and stakeholders**. The dissemination workshops are planned not only in Yerevan but also *marzs* outside the capital city to illustrate proper uses of such maps for planning and policymaking.

VI. USE AND LIMITATIONS OF THE POVERTY MAPPING

49. **The main objective of this exercise is to provide the relative rankings of small geographic units (i.e., *rayons*) according to their predicted poverty rates**. The data sources used in this exercise, the Census of the Population 2001 and the 2004 ILCS, are unlikely to represent the prevailing situation in 2007, since much may have changed during the last three years with the growing and dynamic economy of Armenia. The report explicitly states this time lag and cautions its potential users to take it into account when applying the findings reported here. However, if the changes over the last three years had similar impact across the *marzs* and *rayons* within them, the poverty ranking of the *marzs* and *rayons* may not have varied a great deal. The ability to rank geographic units by the degree of their deprivation is expected to be useful in the allocation and targeting of development resources for maximum poverty impact.

50. **It is worth noting the limitations of the poverty mapping results for practical policy use.** While poverty mapping is a powerful tool to visually locate pockets of poverty that cannot be observed in aggregated or national poverty statistics, caution needs to be made to avoid overuse of the results, particularly for actual design of poverty programs. Despite being a powerful tool for communicating to both technical and non-technical audiences, poverty maps are not a panacea for understanding or solving poverty problems. They are only one tool among many for investigating the complex phenomenon of poverty. In many cases, poverty maps are only indicative of the problems and further well-designed surveys or analyses may be needed for clearer policy implications. Therefore, they should be used in conjunction with other information and analysis that provide context and background about local areas. That said, with adequate caution, the results presented here could aid in identification of the determinants of deprivation in urban and rural areas at the *rayon* level and beyond, and targeting of poverty alleviation programs.

Poverty maps can nonetheless be quite useful tools for targeting interventions. By allowing the estimation of poverty indicators at smaller geographic regions than would be possible with traditional household surveys, poverty mapping increases the effectiveness of targeting the poor, thus enhancing the efficacy of poverty reducing interventions, reducing leakage (i.e. transfers to the non-poor) and increasing coverage (i.e. minimizes the risk that a poor person will be missed by the program). In addition, the poverty maps enable, for instance, testing the targeting effectiveness of the existing social assistance programs and getting a rough idea of the extent of miss-targeting. The findings from poverty mapping exercise could help generate a consensus around the need for better targeting. Although geographic targeting has limitations, its low design and administration costs make it often an effective instrument.

VI. SUMMARY AND CONCLUSIONS

51. **This report provides a geographic profile of poverty and inequality in the Republic of Armenia at lower administrative levels than has been possible with existing household survey data**. It uses small area estimation methodology to predict poverty and inequality at lower administrative levels and combines the 2001 Population Census and 2004 ILCS data to obtain the estimates of poverty and inequality for the 37 rural *rayons* and 47 urban settlement communities. The estimates at *marz* and national levels are also reported, which can be used to compare the census-based predictions of the poverty headcount against those estimates coming directly from the household surveys such as the 2004 ILCS. The disaggregated poverty and inequality data can be of importance in targeting various poverty reduction efforts and improving their impact.

52. **The main objective of the poverty mapping exercise has been to build national capacity in poverty analysis and to produce poverty and inequality information at lower geographic units** to assist country policymakers in their effort to objectively identify and target localities with the greatest need for public support programs. The analysis validates that there is a substantial geographic heterogeneity in the standards of living across Armenia. For example, the *marz* level estimates of the poverty headcount vary from over 50 percent for Shirak to 29 percent in Yerevan, the capital city. Poverty estimates at levels below *marz* also indicate that large disparities exist among *rayons* within the *marz*, ranging from only close to 10 percent in some *rayons* to over 60 percent in others.

53. **The poverty and inequality maps in this report could have several useful applications.** The decentralization and community governance strategies of the Armenian government can find important use from the report. The poverty and inequality estimates at the *rayon* for rural and community level for urban areas can be used as inputs in a detailed analysis of specific regional factors associated with poverty and inequality. The finding of a substantial spatial variation in poverty rates in urban and rural areas and across communities within the same *marz* underscores the importance of looking below the *marz* level picture for effective targeting. By identifying pockets of poverty, this report provides policy makers with an opportunity of improving the design, implementation and evaluation of targeted poverty reduction programs.

54. **The report identifies some correlates of poverty for policy makers to take into account in poverty reduction strategies and in the implementation and evaluation of targeted poverty reduction programs.** It looked at the correlation between observed poverty and education, access to roads and markets, rural infrastructure, elevation, irrigated land, livestock ownership and duration of summer season.

REFERENCE

Elbers, C., J.O. Lanjouw, and P. Lanjouw (2003), "Micro-level Estimation of Poverty and Inequality," Econometrica, 71(1):355-364.

Foster, J., Greer, J., and Thorbecke, E. 1984. "A Class of Decomposable Poverty Measures", *Econometrica*, 52

Hentshel, J., J.O. Lanjouw, P. Lanjouw, and J. Poggi (2000), "Combining Census and Survey Data to Trace the Spatial Dimensions of Poverty: A Case Study of Ecuador," The World Bank Economic Review, 14 (1): 147-65.

National Statistics Service of the RA. 2006. *Social Snapshot and Poverty in the Republic of Armenia*. Statistical Analytical Report, Yerevan.

World Bank. 2003. "Developing a Poverty Map: A How to Manual: A General Outline of Basic Steps," mimeo.

Alam, Murthi, Yemtsov et al. 2005. *Growth, Poverty, and Inequality: Eastern Europe and the Former Soviet Union*, The World Bank, Washington DC.

World Bank. 2001. "Livestock Development: Implications for Rural Poverty, the Environment, and Global Food Security", Directions in Development, the World Bank, Washington, DC.

ANNEX A:
POVERTY MAPPING METHODOLOGY

The poverty mapping exercise is a method to estimate statistically reliable poverty and inequality statistics at geographically disaggregated levels. Poverty mapping involves series of steps that help exploit the strengths of household survey and census population data while overcoming at the same time the shortcomings inherent in them. Poverty mapping exercise primarily entails the use of household survey data to estimate poverty or expenditure equation as a function of household characteristics such as household composition, education, occupation housing conditions and asset ownership, and inserting census data on those same household characteristics into the equation to generate poverty estimates for the census households.

The poverty mapping exercise in this report is based largely on a methodology developed by Elbers, Lanjouw and Lanjouw (2002). Poverty mapping combines the information mainly from household survey and population census in such a way that accurate estimates of the consumption-based poverty and inequality at a more disaggregated regional level can be obtained. The exercise involves three major stages: (1) Data preparation ('*zero stage*'), (2) Consumption model estimation ('*first stage*'), and (3) Prediction of welfare for census population ('*second stage'*). The main purpose of '*zero stage*' is to select a set of variables that are common in both, in our case, the 2004 Armenia ILCS and the 2001 population census data. In the '*first stage'* the subset of variables that are found to have similar distribution in the census and the survey is used to estimate the regression model of per capita consumption. In the '*second stage'*, the obtained set of parameter estimates from the consumption model is applied to the similarly defined variables in the census to obtain the predicted per capita consumption for each census household. Poverty and inequality statistics for small areas are then calculated with the imputed consumption of census households.

The novelty of this method lies in recognizing the errors involved in imputing consumption and translating them into standard errors of poverty estimates. Since poverty statistics are computed based on the imputed consumption, they are contaminated with the imputation errors. Elbers, Lanjouw and Lanjouw (2002) investigate the properties of imputation errors and poverty estimates in detail, and derive a procedure to compute standard errors of poverty estimates as described in the technical details below.

Data Preparation (The 'Zero Stage')

The '*zero stage*' work aims at identifying a set of comparable common variables in the household survey and the census. These common set of variables will be the link between the survey and census data in predicting consumption levels for the census population. It is thus crucial that these linking variables are identically defined in both data sets and maintain a high degree of comparability for achieving reasonable accuracy in predicting welfare levels for the population census. The comparability assessment essentially involves determining whether the variables have statistically similar distribution over the households in the population census and the household survey sample. We perform this comparability test on common variables from the

2001 census and the 2004 ILCS at the national and *marz* levels, at which the 2004 ILCS was designed to be representative of the population. The common census and survey variables are also tested at the level of geographical disaggregation ('regression domains') at which the regression models of the first stage will be estimated (see next section for definition of regression domains).

Identifying Common Variables in Survey and Census Data

A set of about 150 common variables was identified and constructed from the census and ILCS questionnaires (see *Annex B*, Table 1 for the list of these variables). Both the census and ILCS data contain information on household demographic characteristics, education levels, occupational status, and household dwelling conditions. The identified cover these sets of household characteristics which are useful in capturing the economic welfare of households. Before testing the similarity of the variables using distributional statistics, the following criteria were initially used to qualitatively scrutinize their candidacy: (a) Are the survey and census instruments identically worded? (b) Are the criteria pertaining to the questions and answers identical? (c) Are the answer options identical? (d) Are the variables identically defined? In those cases where the number of answer options differs between the census and the ILCS, effort was made to see whether several categories in one data source could be combined in such a way that identical variables are obtained in both data sets. The descriptive statistics (mean, standard deviation, minimum and maximum values) for the selected common variables are then produced at the national and regression domain levels.

The next step of the 'zero stage' is to compare the descriptive statistics of the candidate variables to inspect whether the initially selected variables have statistically similar distributions in the two data sources. As the main criteria for the extent of similarity, we test whether the census mean for a given variable lies within the 95% confidence interval of its survey mean. In those cases where the ILCS mean is found to be outside of the 95% confidence interval, every effort was made to identify the sources of the discrepancy by going back to the original data and their questionnaires. Variables that appear to have different distributional characteristics in the two data sources were carefully scrutinized before they were excluded from subsequent analysis.[10]

Our comparability analysis indicates that significant number of variables common in both survey and census data and with strong correlation with the economic welfare of households, have similar distributional characteristics. Most notables, such as household demographic and education variables, housing conditions and occupational status variables, have strong match in both the census and survey data sets at the national, *marz* and regression domain levels. In addition to these final set of common variables in the survey and census, also included are census means at the community levels to capture location effects.

[10] Note that some differences in the means between the Census and ILCS could be driven by the fact that there is 3 year gap between the two data sources. Hence, careful assessment should be made before excluding variables outside the 95% interval.

Constructing Cluster Level Variables from Census and Ancillary Sources

Alongside the household level variables, the regression models in the first stage also includes some variables that are not at the household level, but rather at the level of cluster that underpins the household survey. These variables are used to capture intra-cluster correlation across households. We construct means and proportion in the population census at the level of community which then are merged with the household survey. The census means and proportion become part of the list of "candidate variables" for the first stage analysis.

Consumption Model Estimation (The 'First Stage')

The 'first stage' involves estimation of household per capita consumption on those variables determined to be common between the census and the ILCS data. Let denote per capita consumption of household h in cluster c by y_{ch}, and let $\boldsymbol{x}_{ch}$ be a set of explanatory variables on household characteristics. The regression equation takes the following form:

$$\ln y_{ch} = E[\ln y_{ch} \mid x_{ch}] + u_{ch} = \mathbf{x}'_{ch}\boldsymbol{\beta} + u_{ch} \qquad (1)$$

Where

c is the subscript for the cluster

h is the subscript for the household within cluster c.

y_{ch} is the per capita expenditure of household h in cluster c.

$\mathbf{x}_{ch}$ is the household characteristic for household h in cluster c.

u_{ch} is an error term.

Separate model is estimated for each regression domain above using the OLS. Sample weights are used in the estimation.

Since survey data is just a sub sample of the whole population, the location information is not available for all regions. As a result we cannot include the location variable in the survey model. Thus, the residual of (1) must contain the location variance:

$$u_{ch} = \eta_c + \varepsilon_{ch} \qquad (2)$$

Where η_c is a location component, and ε_{ch} is a household component of the residual. The location component η_c reflects the part of an error term which is due to some location characteristics common to all households in location c. The household component of the residual ε_{ch} reflects unobserved household characteristics which are not correlated with the location effect. This error structure above allows both for spatial autocorrelation, i.e., a "location effect" for households in the same area, and for heteroskedasticity in the household component of the error. The two error components are independent of one another and uncorrelated with observable characteristics.

A variety of criteria is used in selecting the final set of variables to be included in the consumption model among the eligible candidate variables from household survey and census, census cluster means and ancillary sources. One key indicator to look at when selecting variables for inclusion in the household regression model is their contribution to the overall R^2 of the regression model. We will maintain a reasonable level of precision in parameter estimates on variables that are accepted for inclusion in the consumption regression. Since the household component of the total residual is likely to be heteroskedastic, we also correct for heteroskedasticity (see below for more details). This has been done for each of the 6 domains to achieve a specification that gives the best explanatory power and minimize the unexplained location effect.

Correcting for Heteroskedasticity

The parameter estimates of the regression model will be inconsistent and prediction based on them will be inappropriate if the household component of the residual is not homogenous. This is a very likely case in poverty mapping exercises. In order to address this modeling issue, we employ standard procedures to obtain heteroskedasticity corrected variance –covariance matrix for parameter estimates. We model e_{ch}^2, household component of the model residual, as a function of variables chosen from the list of explanatory variables and their higher degree polynomials, denoted by $\mathbf{z}_{ch}$, that best explain the variation in e_{ch}^2. We estimate a logistic model of the variance of ε_{ch} conditional on $\mathbf{z}_{ch}$, bounding the prediction between zero and a maximum, A, set equal to $(1.05) * \max\{e_{ch}^2\}$:

$$\ln[\frac{e_{ch}^2}{A - e_{ch}^2}] = z_{ch}^T \hat{\alpha} + r_{ch}$$

Letting $\exp\{z_{ch}^T \hat{\alpha}\} = B$ and using the delta method, the variance of ε_{ch} is estimated as:

$$\hat{\sigma}_{\varepsilon,ch}^2 = [\frac{AB}{1+B}] + \frac{1}{2} Var(r)[\frac{AB(1-B)}{(1+B)^3}]$$

The variance of η_c is estimated non-parametrically, allowing for heteroskedasticity in ε_{ch} (see *Appendix B* of Elbers, Lanjouw and Lanjouw, 2003). The two variance components are combined in order to calculate the estimated variance covariance matrix ($\hat{\Sigma}$) of the overall residual of the original model. Once $\hat{\Sigma}$ is calculated the original consumption model is estimated by GLS as described above.

Prediction household consumption using census data (the 'Second Stage')

The final stage involves taking the model specifications derived in the first stage, extracting the parameter estimates from these specifications for various domains, and applying these to the census data so as to generate predicted log per capita consumption for each household in the census. These predicted log per capita consumption variable, along with the chosen poverty line,

is then used to produce estimates of poverty for specified localities in the population census. Poverty simulation software, POVMAP 2, produced by the World Bank staff (Zhao, 2003) is used to conduct a series of 100 simulations, where for each simulation we draw a vector of the first stage parameters $\tilde{\boldsymbol{\beta}}$ from the multivariate normal distribution described by the first stage beta estimates and their associated variance-covariance matrix. In each simulation the location component of the error term $\tilde{\eta}_c$ and the household component $\tilde{\varepsilon}_{ch}$ are also drawn from the corresponding empirical distributions. Note that we assume hierarchical non parametric distribution for both components of the error term, whereby a draw for a particular household is made not from the whole distribution, but from the segment of the distribution related to the cluster that the household belongs to. After drawing values for $\tilde{\boldsymbol{\beta}}$, $\tilde{\eta}_c$ and $\tilde{\varepsilon}_{ch}$, the value of per capita consumption $\hat{y}_{ch}$ is estimated for each simulation as:

$$\hat{y}_{ch} = \exp\left(\mathbf{x}'_{ch}\tilde{\boldsymbol{\beta}} + \tilde{\eta}_c + \tilde{\varepsilon}_{ch}\right) \qquad (3)$$

The full vector of simulated per capita consumption, $\hat{y}_{ch}$, is then used to calculate the mean and standard deviation of each welfare measure (per capita consumption, poverty and inequality) for each spatial subgroup desired.

ANNEX B:
SURVEY, POPULATION CENSUS AND ANCILLARY VARIABLES

Table 1: Candidate Household Level Variables in the ILCS and Population Census

Integrated Living Conditions Survey (ILCS)			Population Census
Source of information (questionnaire form №, section №, question №)	Variable's label	Variable's name	Source of information (questionnaire form №, section №, question №)
Demographic characteristics of households			
Form 1, Section A, Table 1	Total number of household members (permanent and absent members)	HHSIZET	Form 1, q1
Form 1, Section A, Table 1	Number of permanent members in the household (HH)	HHSIZE	Form 1, q2
Form 1, Section A, Table 1, q1	Number of men in the HH	N_MEN	Form 1, q8
Form 1, Section A, Table 1, q1	Share of men in the household (HH)	S_MEN	Form 1, q8
Form 1, Section A, Table 1, q1	Number of women in the HH	N_WOMEN	Form 1, q8
Form 1, Section A, Table 1, q1	Share of women in the HH	S_WOMEN	Form 1, q8
Form 1, Section A, Table 1, q3, q4	Average age of HH members	AVAGE	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children (age<7) in the HH	N_AGE0_6	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of children (age<7) in the HH	S_AGE0_6	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children (age 7 to 17) in the HH	N_AGE7_17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 7 to 17) in the HH	S_AGE7_17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children (age<18) in the HH	N_AGE0_17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of children (age<18) in the HH	S_AGE0_17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of members (age 18 to 24) in the HH	N_AGE18_24	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 18 to 24) in the HH	S_AGE18_24	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of members (age 25 to 34) in the HH	N_AGE25_34	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 25 to 34) in the HH	S_AGE25_34	Form 1, q9

Form 1, Section A, Table 1, q3, q4	Number of members (age 35 to 44) in the HH	N_AGE35_44	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 35 to 44) in the HH	S_AGE35_44	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of members (age 45 to 58) in the HH	N_AGE45_58	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 45 to 58) in the HH	S_AGE45_58	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of members (age 18 to 58) in the HH	N_AGE18_58	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 18 to 58) in the HH	S_AGE18_58	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of members (age 59+) in the HH	N_AGE59_	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of members (age 59+) in the HH	S_AGE59_	Form 1, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age<7) in the HH	N_AGE0_6F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age<7) in the HH	S_AGE0_6F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 7 to 17) in the HH	N_AGE7_17F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age7 to 17) in the HH	S_AGE7_17F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age<18) in the HH	N_AGE0_17F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age<18) in the HH	S_AGE0_17F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 18 to 24) in the HH	N_AGE18_24F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age 18 to 24) in the HH	S_AGE18_24F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 25 to 34) in the HH	N_AGE25_34F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age 25 to 34) in the HH	S_AGE25_34F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 35 to 44) in the HH	N_AGE35_44F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of members (age 35 to 44) in the HH	S_AGE35_44F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 45 to 58) in the HH	N_AGE45_58F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age 45 to 58) in the HH	S_AGE45_58F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 18 to 58) in the HH	N_AGE18_58F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age 18 to 58) in the HH	S_AGE18_58F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of women (age 59+) in the HH	N_AGE59_F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of women (age 59+) in the HH	S_AGE59_F	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age<7) in the HH	N_AGE0_6M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age<7) in the HH	S_AGE0_6M	Form 1, q8, q9

Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 7 to 17) in the HH	N_AGE7_17M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age7 to 17) in the HH	S_AGE7_17M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age<18) in the HH	N_AGE0_17M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age<18) in the HH	S_AGE0_17M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 18 to 24) in the HH	N_AGE18_24M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 18 to 24) in the HH	S_AGE18_24M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 25 to 34) in the HH	N_AGE25_34M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 25 to 34) in the HH	S_AGE25_34M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 35 to 44) in the HH	N_AGE35_44M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 35 to 44) in the HH	S_AGE35_44M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 45 to 58) in the HH	N_AGE45_58M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 45 to 58) in the HH	S_AGE45_58M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 18 to 58) in the HH	N_AGE18_58M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 18 to 58) in the HH	S_AGE18_58M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Number of men (age 59+) in the HH	N_AGE59_M	Form 1, q8, q9
Form 1, Section A, Table 1, q1, q3, q4	Share of men (age 59+) in the HH	S_AGE59_M	Form 1, q8, q9
Form 1, Section A, Table 1, q3, q4	Dependence ratio (number of children/number of adults)	DEPEND_RATIO	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of pension age members in the HH (retirement age: men age>=63; women age>=59)	N_PENSNAGE	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Share of pension age members in the HH	S_PENSNAGE	Form 1, q9
Form 1, Section A, Table 1, q3, q4	No children (age <=17)	N0_CH17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children in the HH equals to 1 or 2 (age<=17)	N1_2_CH17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children in the HH equals to 3 or 4 (age<=17)	N3_4_CH17	Form 1, q9
Form 1, Section A, Table 1, q3, q4	Number of children in the HH equals to 5 or more (age<=17)	N5_CH17	Form 1, q9
Form 1, Section A, Table 1, q3, q4, q9	Number of adults (age 18+) with no or incomplete primary education	N_NOEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Share of adults (age 18+) with no or incomplete primary education	S_NOEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Number of adults (age 18+) with primary education	N_PEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Share of adults (age 18+) with primary education	S_PEDUC	Form 1, q9, q19

Form 1, Section A, Table 1, q3, q4, q9	Number of adults (age 18+) with general basic education	N_GSEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Share of adults (age 18+) with general basic education	S_GSEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Number of adults (age 18+) with secondary education	N_SEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Share of adults (age 18+) with secondary education	S_SEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Number of adults (age 18+) with higher education	N_HEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q3, q4, q9	Share of adults (age 18+) with higher education	S_HEDUC	Form 1, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of women (age 18+) with no or incomplete primary education	N_NOEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of women (age 18+) with no or incomplete primary education	S_NOEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of women (age 18+) with primary education	N_PEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of women (age 18+) with primary education	S_PEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of women (age 18+) with general basic education	N_GSEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of women (age 18+) with general basic education	S_GSEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of women (age 18+) with secondary education	N_SEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of women (age 18+) with secondary education	S_SEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of women (age 18+) with higher education	N_HEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of women (age 18+) with higher education	S_HEDUC_F	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of men (age 18+) with no or incomplete primary education	N_NOEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of men (age 18+) with no or incomplete primary education	S_NOEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of men (age 18+) with primary education	N_PEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of men (age 18+) with primary education	S_PEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of men (age 18+) with general basic education	N_GSEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of men (age 18+) with general basic education	S_GSEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of men (age 18+) with secondary education	N_SEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of men (age 18+) with secondary education	S_SEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Number of men (age 18+) with higher education	N_HEDUC_M	Form 1, q8, q9, q19
Form 1, Section A, Table 1, q1,q3, q4, q9	Share of men (age 18+) with higher education	S_HEDUC_M	Form 1, q8, q9, q19

Form 1, Section A, Table 1, q9	Highest level of education among HH members (maximum educational level)	MAXEDL	Form 1, q19
Form 1, Section A, Table 1, q1, q9	Highest level of education among female HH members	MAXEDLF	Form 1, q8, q19
Form 1, Section A, Table 1, q1, q9	Highest level of education among male HH members	MAXEDLM	Form 1, q8, q19
Main Source of Income of Household Members			
Diary (Form 2), Section Y, Table Y.1, q2	Number of members reporting wage income as main source of income	N_INCWAGE	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting income from self-employment as main source of income	N_INCSELFE	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting income from ownership as main source of income	N_INCPROP	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting pensions as main source of income	N_INCPENS	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting social assistance (FPB and other transfers) as main income source	N_INCSA	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting remittances as main income source	N_INCREMT	Form 1, q18
Diary, Section Y, Table Y.1, q2	Number of members reporting other sources of income	N_INCOTH	Form 1, q18
Labor Force Status of Household Members			
Form 1, Section A, q3, q4, Section D, Table 1, q1, q2, Table 2, q1, Table 3, q7, q9	Share of unemployed adults	S_UNEMP	Form 1, q29, q30
Form 1, Section A, q3, q4, Section D, Table 1, q7	Share of adults (age 18+) working as employees	S_EMPLOYEE	Form 1, q28
Form 1, Section A, q3, q4, Section D, Table 1, q7	Share of adults (age 18+) working as employer/self-employed	S_SELFEMP	Form 1, q28
Form 1, Section A, q3, q4, Section D, Table 1, q7	Share of adults (age 18+) working on own farm/land plot	S_FARMEMP	Form 1, q28
Form 1, Section A, q3, q4, Section D, Table 1, q7	Share of adults (age 18+) in 'other' employment category	S_OTHEMP	Form 1, q28
Form 1, Section A, q3, q4, Section D, Table 1, q1, q2, Table 2, q1	Share of inactive adults (age 18+) (others not unemployed, not employed)	S_INACTIVE	Form 1, q29
Household Head Characteristics			
Form 1, Section A, q2, q3, q4	Age of HH head	HAGE	Form 1, q7a, q9
Form 1, Section A, q2, q3, q4	Age of HH head squared	HAGE2	Form 1, q7a, q9

Form 1, Section A, q2, q1	Sex of HH head	HGENDER	Form 1, q7a, q8
Form 1, Section A, q2, q5	HH head is married	HMSMAR	Form 1, q7a, q24a
Form 1, Section A, q2, q5	HH head is single	HMSSING	Form 1, q7a, q24a
Form 1, Section A, q2, q5	HH head is widow	HMSWIDOW	Form 1, q7a, q24a
Form 1, Section A, q2, q5	HH head is divorced	HMSDIVOR	Form 1, q7a, q24a
Form 1, Section A, q2, q9	HH head has no education or incomplete primary education	HEDNOPRIM	Form 1, q7a, q19
Form 1, Section A, q2, q9	HH head has primary education	HEDPRIM	Form 1, q7a, q19
Form 1, Section A, q2, q9	HH head has general basic education	HEDGSEC	Form 1, q7a, q19
Form 1, Section A, q2, q9	HH head has secondary education	HEDSEC	Form 1, q7a, q19
Form 1, Section A, q2, q9	HH head has higher education	HEDHIGH	Form 1, q7a, q19
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has wage income as main source of income	HINCWAGE	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has income from self-employment as main source of income	HINCSELFE	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has income from ownership as main source of income	HINCPROP	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has pension income as main source of income	HINCPENS	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has social assistance as main source of income	HINCSA	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has remittances as main source of income	HINCREMT	Form 1, q7a, q18
Form 1, Section A, q2, Diary, Section Y, Table Y.1, q2	HH head has other income as main source of income	HINCOTH	Form 1, q7a, q18
Form 1, Section A, q2, Section D, Table 1, q1, q2, Table 2, q1, Table 3, q7, q9	HH head is unemployed	HUNEMP	Form 1, q7a, q29, q30
Form 1, Section A, q2, Section D, Table 1, q7	HH head is employee	HEM_EMPLOYEE	Form 1, q7a, q28
Form 1, Section A, q2, Section D, Table 1, q7	HH head is employer/self-employed	HEM_SELFEMP	Form 1, q7a, q28
Form 1, Section A, q2, Section D, Table 1, q7	HH head is working on own farm/land plot	HEM_FARMEMP	Form 1, q7a, q28
Form 1, Section A, q2, Section D, Table 1, q7	HH head is working in other employment category	HEM_OTHEMP	Form 1, q7a, q28
Form 1, Section A, q2, , Section D, Table 1, q1, q2, Table 2, q1	HH head is inactive	HINACTIVE	Form 1, q7a, q29

Dwelling conditions of the household			
Form 1, Section C, q1	HH lives in a separate house/part of the house	HOUSE	Form 2, q1, q2
Form 1, Section C, q1	HH lives in a separate flat/part of the flat	APPART	Form 2, q1, q2
Form 1, Section C, q1	HH lives in temporary lodging, institutional establishments, etc.	TEMPLODG	Form 2, q1, q2
Form 1, Section C, q1	HH lives in other premises	OTHPREM	Form 2, q1, q2
Form 1, Section C, q15	HH has central heating	CENTHEAT	Form 2, q5
Form 1, Section C, q16	HH has other heating source	OTHHEAT	Form 2, q5
Form 1, Section C, q15	HH has no heating source	NOHEAT	
Form 1, Section C, q11, q12	HH has centralized water supply in the dwelling	CENTWATIN	Form 2, q7
Form 1, Section C, q11, q12	HH has centralized water supply outside the dwelling	CENTWATOUT	Form 2, q7
Form 1, Section C, q11	HH has own system of water supply	OWNSYSWAT	Form 2, q7
Form 1, Section C, q11	HH use spring water, wells and other	SPRINGWAT	Form 2, q7
Form 1, Section C, q10	HH has toilet in the dwelling	TOILETIN	Form 2, q9
Form 1, Section C, q10	HH has toilet outside the dwelling	TOILETOUT	Form 2, q9
Form 1, Section C, q10	HH has bath/shower	BATH	Form 2, q8
Form 1, Section C, q10	HH has telephone	TELEPH	Form 2, q12
Form 1, Section C, q2	HH owns the dwelling	HHOWNSDWELL	Form 2, q13
Form 1, Section C, q5	Living area occupied by the HH, meter squared	LIVINGA	Form 2, q15
Form 1, Section C, q5	Living area occupied by the HH per capita	LIVINGA_PC	Form 2, q15
Form 1, Section C, q4	Number of living rooms	NLROOMS	Form 2, q14
Form 1, Section C, q4	Number of living rooms, per capita	NLROOMS_PC	Form 2, q14

Table 2: Community level Census variables

Source of information (questionnaire form №, section №, question №)	Variable	Variable Label	Explanation related to the variable
Reasons for Changing the Residence			
Form 1, q15	RSN_WAR	War in bordering territories of RA	At the community level
Form 1, q15	RSN_EARTHQ	Earthquake in RA territories	At the community level
Form 1, q15	RSN_FORCREMVD	Forcedly removed from Azerbaijan	At the community level
Form 1, q15	RSN_COMPREMVD_NK	Compulsory removed from Nagorniy Karabagh	At the community level
Form 1, q15	RSN_COMPREMVD_OTHER	Compulsory removed from other countries	At the community level
Form 1, q15	RSN_OTHER	Other reason	At the community level
Household Dwelling Conditions			
Form 2, q4	DWELL_STONE	Construction material of dwelling is stone, brick	At the community level
Form 2, q4	DWELL _IRON	Construction material of dwelling is iron-concrete, block	At the community level
Form 2, q4	DWELL _WOOD	Construction material of dwelling is wood	At the community level
Form 2, q4	DWELL _MIXED	Construction material of dwelling is mixed or other	At the community level
Form 2, q6	ELECT_COOK	HH use electricity for cooking	At the community level
Form 2, q5	ELECTR	HH has electricity	At the community level

ANNEX C:
POVERTY AND INEQUALITY IN *MARZS* AND *RAYONS* OF ARMENIA

Marz/Rayon	Number of Households	Population	avg_ FGT0	se_ FGT0	avg_GFT0/se_ FGT0	avg_ FGT1	se_ FGT1	avg_GFT1/se _FGT1	avg_ FGT2	se_ FGT2	avg_GFT2/s e_FGT2	avg_ GINI	se_ GINI	avg_GIN I/se_GIN I
Yerevan	**286714**	**1136115**	**0.2899**	**0.0133**	**21.7899**	**0.0706**	**0.0054**	**13.0569**	**0.0258**	**0.0027**	**9.5357**	**0.2834**	**0.0064**	**44.2683**
Adjapnyak	28171	109775	0.3939	0.0264	14.9333	0.0920	0.0119	7.7241	0.0318	0.0059	5.3695	0.2358	0.0168	14.0631
Avan	12782	51808	0.1714	0.0165	10.3805	0.0378	0.0048	7.9532	0.0131	0.0020	6.4633	0.2775	0.0073	38.2516
Arabkir	37820	136907	0.2461	0.0192	12.8385	0.0588	0.0071	8.3315	0.0213	0.0034	6.2496	0.2806	0.0079	35.5757
Davidashen	10605	41901	0.2246	0.0140	16.0726	0.0523	0.0047	11.1229	0.0187	0.0021	8.8495	0.2804	0.0080	35.0518
Erebuni	27867	120471	0.2711	0.0148	18.3250	0.0631	0.0053	11.8434	0.0225	0.0025	9.0853	0.2737	0.0069	39.6006
Kentron	35612	134607	0.2199	0.0170	12.9154	0.0519	0.0063	8.1860	0.0188	0.0030	6.1715	0.2826	0.0081	34.8336
Malatia-Sebastia	34409	146280	0.2377	0.0141	16.8401	0.0547	0.0046	11.7901	0.0194	0.0021	9.2241	0.2771	0.0068	40.8015
Nor Nork	37691	147206	0.3272	0.0177	18.4454	0.0814	0.0070	11.6577	0.0301	0.0034	8.7502	0.2783	0.0072	38.6340
Nork-Marash	2897	12150	0.3344	0.0171	19.6056	0.0810	0.0066	12.2537	0.0294	0.0032	9.1996	0.2743	0.0078	34.9832
Nubarashen	2116	9216	0.4167	0.0446	9.3437	0.1106	0.0159	6.9563	0.0424	0.0073	5.8386	0.2745	0.0087	31.6085
Shengavit	35476	144893	0.3736	0.0203	18.4065	0.0954	0.0078	12.2961	0.0358	0.0038	9.4548	0.2755	0.0071	38.9352
Kanaker-Zeytun	21268	80901	0.3324	0.0174	19.1345	0.0924	0.0096	9.6628	0.0375	0.0055	6.7610	0.3195	0.0198	16.1443
Aragatson	**35015**	**149692**	**0.3224**	**0.0159**	**20.3176**	**0.0718**	**0.0054**	**13.3279**	**0.0250**	**0.0026**	**9.6532**	**0.2481**	**0.0109**	**22.7884**
u. Ashtarak	5390	22196	0.4758	0.0499	9.5440	0.1113	0.0179	6.2095	0.0389	0.0080	4.8906	0.2351	0.0164	14.3126
u.Aparan	1734	7322	0.3170	0.0507	6.2563	0.0704	0.0155	4.5484	0.0242	0.0065	3.7351	0.2421	0.0178	13.5669
u.Talin	1715	6307	0.3409	0.0634	5.3739	0.0654	0.0170	3.8375	0.0198	0.0064	3.0961	0.2118	0.0150	14.1234
r.Ashtarak	10418	48751	0.3218	0.0210	15.3521	0.0698	0.0064	10.9131	0.0238	0.0028	8.5966	0.2408	0.0118	20.3840
r.Aparan	3294	16329	0.1213	0.0192	6.3324	0.0234	0.0045	5.2403	0.0077	0.0018	4.3105	0.2404	0.0164	14.6664
r.Aragts	3320	15214	0.5551	0.0466	11.9084	0.1440	0.0214	6.7220	0.0563	0.0135	4.1574	0.2417	0.0235	10.3020
r.Talin	9144	33573	0.2121	0.0252	8.4133	0.0409	0.0062	6.5788	0.0131	0.0025	5.3304	0.2266	0.0139	16.3259
Ararat	**64177**	**301081**	**0.3420**	**0.0161**	**21.2474**	**0.0843**	**0.0055**	**15.2447**	**0.0322**	**0.0028**	**11.6698**	**0.2421**	**0.0091**	**26.5**
u. Ararat	7153	34573	0.4980	0.0378	13.1702	0.1466	0.0169	8.6771	0.0616	0.0092	6.6654	0.2914	0.0181	16.0716
u. Artashat	7490	29821	0.5435	0.0466	11.6665	0.1698	0.0203	8.3501	0.0735	0.0106	6.9021	0.2993	0.0149	20.1338
u. Masis	4870	23669	0.5607	0.0530	10.5881	0.1617	0.0236	6.8425	0.0655	0.0123	5.3053	0.2655	0.0212	12.5503
r. Ararat	13296	64267	0.3152	0.0255	12.3774	0.0680	0.0073	9.3380	0.0236	0.0031	7.5098	0.2279	0.0140	16.2982
r. Artashat	18023	85831	0.2108	0.0202	10.4357	0.0428	0.0050	8.5068	0.0145	0.0020	7.1951	0.2168	0.0111	19.5371
r. Masis	13345	62920	0.2849	0.0282	10.0887	0.0540	0.0078	6.8871	0.0167	0.0030	5.5279	0.1943	0.0120	16.2437

Marz/Rayon	**Number of Households**	**Population**	**avg_ FGT0**	**se_ FGT0**	**avg_GFT0/se_ FGT0**	**avg_ FGT1**	**se_ FGT1**	**avg_GFT1/se _FGT1**	**avg_ FGT2**	**se_ FGT2**	**avg_GFT2/se_FGT2**	**avg_ GINI**	**se_ GINI**	**avg_GINI/se_GINI**
Armavir	**64031**	**299788**	**0.3497**	**0.0177**	**19.8015**	**0.0786**	**0.0066**	**11.8403**	**0.0276**	**0.0032**	**8.6315**	**0.2433**	**0.0096**	**25.4513**
u. Armavir	11359	46574	0.3385	0.0372	9.0889	0.0811	0.0116	6.9615	0.0296	0.0049	5.9837	0.2713	0.0140	19.3110
u.Echmiatsin	13138	60426	0.4693	0.0426	11.0177	0.1201	0.0179	6.7080	0.0452	0.0088	5.1564	0.2603	0.0155	16.8317
r.Armavir	16293	81868	0.3244	0.0243	13.3715	0.0658	0.0071	9.3239	0.0216	0.0031	7.0565	0.2258	0.0110	20.5172
r.Baghramyan	4850	22423	0.2274	0.0298	7.6302	0.0491	0.0083	5.9543	0.0168	0.0035	4.7506	0.2376	0.0149	15.9359
r.Echmiatsin	18391	88497	0.3287	0.0254	12.9501	0.0684	0.0080	8.5510	0.0228	0.0035	6.4574	0.2209	0.0131	16.9255
Gegharkunik	**55258**	**259831**	**0.4261**	**0.0294**	**14.4855**	**0.1010**	**0.0106**	**9.5644**	**0.0354**	**0.0047**	**7.5711**	**0.2414**	**0.0087**	**27.8593**
u.Kamo	7045	31989	0.4985	0.0850	5.8624	0.1219	0.0327	3.7245	0.0425	0.0142	2.9944	0.2256	0.0105	21.4974
u.Karmir	1693	6609	0.6226	0.0938	6.6386	0.1988	0.0489	4.0630	0.0839	0.0263	3.1865	0.2795	0.0243	11.5259
u.Martuni	2807	12611	0.4313	0.0915	4.7132	0.0930	0.0282	3.2971	0.0298	0.0107	2.7813	0.2120	0.0100	21.1188
u.Sevan	6333	23977	0.5914	0.0879	6.7256	0.1709	0.0419	4.0778	0.0671	0.0207	3.2492	0.2457	0.0102	24.1006
u.Vardenis	3398	13974	0.4027	0.0571	7.0470	0.1133	0.0227	4.9936	0.0453	0.0110	4.1288	0.3084	0.0238	12.9424
r.Kamo	6689	34946	0.4123	0.0594	6.9460	0.0806	0.0157	5.1387	0.0240	0.0055	4.3632	0.1896	0.0103	18.4729
r.Karmir	2539	9599	0.2655	0.0592	4.4872	0.0627	0.0142	4.4215	0.0237	0.0058	4.1026	0.2364	0.0135	17.4501
r.Martuni	13477	76771	0.3559	0.0445	8.0039	0.0749	0.0124	6.0419	0.0243	0.0047	5.1406	0.2173	0.0114	19.1400
r.Sevan	4134	21069	0.5728	0.0427	13.4014	0.1482	0.0179	8.2918	0.0542	0.0088	6.1521	0.2370	0.0190	12.4929
r.Vardenis	7143	28286	0.3215	0.0374	8.5849	0.0671	0.0100	6.7130	0.0217	0.0038	5.7775	0.2688	0.0144	18.6509
Lori	**86154**	**319116**	**0.3311**	**0.0195**	**16.9650**	**0.0777**	**0.0070**	**11.1775**	**0.0277**	**0.0032**	**8.5519**	**0.2617**	**0.0083**	**31.4542**
u.Vanadzor	33709	125138	0.4076	0.0398	10.2382	0.0980	0.0141	6.9698	0.0349	0.0064	5.4632	0.2499	0.0136	18.3571
u.Tumanyan	7029	24631	0.4346	0.0370	11.7437	0.1245	0.0165	7.5478	0.0514	0.0090	5.7053	0.2985	0.0214	13.9525
u.Spitak	4427	15537	0.3184	0.0521	6.1074	0.0670	0.0158	4.2437	0.0217	0.0067	3.2305	0.2232	0.0231	9.6481
u.Stepanavan	5031	17440	0.4168	0.0502	8.3006	0.0997	0.0170	5.8617	0.0349	0.0074	4.7350	0.2455	0.0158	15.5722
u.Tashir	3102	10814	0.3642	0.0447	8.1478	0.0896	0.0174	5.1372	0.0331	0.0086	3.8380	0.2523	0.0266	9.4794
r.Gugark	8121	30183	0.2453	0.0254	9.6684	0.0506	0.0075	6.7185	0.0168	0.0032	5.3028	0.2648	0.0142	18.6979
r.Tumanyan	6929	28314	0.3535	0.0337	10.4899	0.0743	0.0100	7.4457	0.0246	0.0041	5.9506	0.2460	0.0176	13.9397
r.Spitak	7966	28132	0.1006	0.0180	5.5945	0.0193	0.0047	4.0617	0.0061	0.0018	3.3832	0.2291	0.0148	15.5052
r.Stepanavan	4943	18601	0.1336	0.0142	9.4387	0.0292	0.0047	6.1726	0.0103	0.0022	4.7649	0.2419	0.0128	18.9686
r.Tashir	4897	20326	0.2481	0.0375	6.6085	0.0491	0.0097	5.0553	0.0158	0.0037	4.2310	0.2260	0.0168	13.4217
Kotayk	**70972**	**299221**	**0.3718**	**0.0256**	**14.5111**	**0.0880**	**0.0080**	**10.9512**	**0.0304**	**0.0032**	**9.3545**	**0.2520**	**0.0095**	**26.5983**
u.Abovyan (Kotayk)	16094	62046	0.1878	0.0358	5.2420	0.0391	0.0083	4.6933	0.0125	0.0029	4.3639	0.2517	0.0101	25.0349
u.Hrazdan	22522	89523	0.5417	0.0528	10.2590	0.1416	0.0189	7.4783	0.0515	0.0080	6.4096	0.2328	0.0104	22.2960
u.Nairi	5262	22988	0.4403	0.0529	8.3277	0.1046	0.0169	6.1908	0.0360	0.0069	5.2051	0.2259	0.0127	17.8151

Marz/Rayon	**Number of Households**	**Population**	**avg_ FGT0**	**se_ FGT0**	**avg_GFT0/se_ FGT0**	**avg_ FGT1**	**se_ FGT1**	**avg_GFT1/se _FGT1**	**avg_ FGT2**	**se_ FGT2**	**avg_GFT2/se_FGT2**	**avg_ GINI**	**se_ GINI**	**avg_GINI/se_GINI**
r.Abovyan (Kotayk)	13445	60364	0.2233	0.0278	8.0394	0.0436	0.0065	6.6924	0.0134	0.0023	5.8533	0.2224	0.0118	18.9233
r.Hrazdan	5472	25369	0.4994	0.0508	9.8217	0.1210	0.0167	7.2457	0.0420	0.0068	6.1701	0.2296	0.0149	15.4310
r.Nairi	8177	38931	0.3791	0.0462	8.1987	0.0797	0.0123	6.4584	0.0254	0.0045	5.6020	0.2053	0.0125	16.4480
Shirak	**75367**	**300802**	**0.5116**	**0.0660**	**7.7469**	**0.1338**	**0.0253**	**5.2921**	**0.0490**	**0.0113**	**4.3411**	**0.2570**	**0.0085**	**30.3485**
u.Gyumri	41491	160384	0.4876	0.1138	4.2833	0.1305	0.0437	2.9846	0.0489	0.0196	2.4985	0.2541	0.0094	27.0358
u.Ani	1534	6382	0.6047	0.0820	7.3764	0.1780	0.0400	4.4525	0.0707	0.0201	3.5256	0.2512	0.0140	17.9534
u.Artik	4321	17594	0.5852	0.1008	5.8082	0.1546	0.0437	3.5350	0.0566	0.0203	2.7914	0.2211	0.0113	19.6506
r.Akhuryan	10775	49088	0.6381	0.0401	15.8931	0.1690	0.0189	8.9625	0.0612	0.0090	6.7683	0.2235	0.0135	16.5692
r.Amasia	2218	7963	0.1340	0.0565	2.3704	0.0311	0.0140	2.2164	0.0115	0.0056	2.0512	0.2722	0.0173	15.7522
r.Ani	3321	15476	0.5164	0.0459	11.2417	0.1333	0.0162	8.2280	0.0485	0.0072	6.7793	0.2392	0.0141	16.9239
r.Ashotsk	2728	10398	0.4721	0.0480	9.8311	0.1088	0.0162	6.7097	0.0361	0.0068	5.3158	0.2410	0.0151	15.9412
r.Artik	8979	33517	0.4860	0.0436	11.1581	0.1113	0.0146	7.6005	0.0367	0.0061	6.0536	0.2410	0.0135	17.8334
Sjunik	**39880**	**153643**	**0.3802**	**0.0277**	**13.7328**	**0.0907**	**0.0095**	**9.5935**	**0.0312**	**0.0040**	**7.8309**	**0.2599**	**0.0098**	**26.5001**
u.Goris	5614	23185	0.2789	0.0528	5.2836	0.0679	0.0151	4.4822	0.0244	0.0060	4.0521	0.2678	0.0153	17.4956
u.Kapan	15161	54157	0.4832	0.0639	7.5565	0.1178	0.0217	5.4327	0.0409	0.0090	4.5263	0.2332	0.0120	19.4730
u.Meghri	2596	9580	0.2387	0.0487	4.8960	0.0568	0.0134	4.2444	0.0200	0.0052	3.8643	0.2829	0.0150	18.8526
u.Sisian	4334	17232	0.5822	0.0837	6.9592	0.1410	0.0304	4.6366	0.0471	0.0129	3.6441	0.2200	0.0217	10.1502
r.Goris	4587	20815	0.1392	0.0243	5.7209	0.0265	0.0050	5.2679	0.0082	0.0017	4.8491	0.2147	0.0115	18.6148
r.Kapan	2749	8871	0.2635	0.0398	6.6223	0.0560	0.0105	5.3455	0.0181	0.0038	4.7159	0.2334	0.0131	17.8198
r.Meghri	839	2658	0.3051	0.0586	5.2097	0.0747	0.0152	4.9146	0.0275	0.0057	4.8186	0.2566	0.0154	16.7028
r.Sisian	4000	17145	0.4327	0.0409	10.5800	0.1027	0.0122	8.3966	0.0355	0.0050	7.1204	0.2458	0.0152	16.1747
Vayots Dzor	**14320**	**61664**	**0.2842**	**0.0252**	**11.2821**	**0.0566**	**0.0061**	**9.2789**	**0.0170**	**0.0022**	**7.6393**	**0.2466**	**0.0098**	**25.0846**
u.Yeghegnadzor	2233	8872	0.1913	0.0290	6.5848	0.0388	0.0073	5.3458	0.0119	0.0027	4.4660	0.2529	0.0147	17.1797
u.Vayk (Azizbekov)	3576	12751	0.2442	0.0276	8.8326	0.0539	0.0071	7.6207	0.0175	0.0026	6.6872	0.2766	0.0145	19.1155
r.Yeghegnadzor	6341	30490	0.3330	0.0369	9.0307	0.0652	0.0089	7.3115	0.0192	0.0032	5.9266	0.2216	0.0114	19.4461
r.Vayk (Azizbekov)	2170	9551	0.2681	0.0285	9.3932	0.0492	0.0068	7.2826	0.0137	0.0024	5.7878	0.2286	0.0116	19.6566
Tavush	**35173**	**144551**	**0.3202**	**0.0176**	**18.2065**	**0.0686**	**0.0051**	**13.5405**	**0.0216**	**0.0021**	**10.3054**	**0.2535**	**0.0084**	**30.0129**
u.Idjevan	4810	18701	0.3598	0.0404	8.9076	0.0796	0.0120	6.6501	0.0257	0.0049	5.2879	0.2615	0.0113	23.0935

Marz/Rayon	**Number of Households**	**Population**	**avg_ FGT0**	**se_ FGT0**	**avg_GFT0/se_ FGT0**	**avg_ FGT1**	**se_ FGT1**	**avg_GFT1/se_FGT1**	**avg_ FGT2**	**se_ FGT2**	**avg_GFT2/se_FGT2**	**avg_ GINI**	**se_ GINI**	**avg_GINI/se_GINI**
u.Noyemberyan	5149	20612	0.2395	0.0287	8.3555	0.0484	0.0070	6.8786	0.0148	0.0025	5.9592	0.2521	0.0111	22.8075
u.Tavush	1468	5738	0.2635	0.0247	10.6611	0.0522	0.0068	7.6710	0.0155	0.0027	5.8350	0.2461	0.0127	19.3575
u.Dilijan	2317	9213	0.2716	0.0294	9.2313	0.0511	0.0068	7.5151	0.0147	0.0024	6.0748	0.2252	0.0105	21.3887
r.Idjevan	8649	36064	0.3150	0.0227	13.8825	0.0681	0.0061	11.2291	0.0217	0.0024	8.8899	0.2523	0.0096	26.2869
r.Noyemberyan	6842	28970	0.2679	0.0189	14.2048	0.0554	0.0053	10.3599	0.0169	0.0021	8.0788	0.2512	0.0133	18.9189
r.Tavush	5938	25253	0.4554	0.0318	14.3411	0.1032	0.0102	10.1157	0.0332	0.0042	7.8409	0.2375	0.0108	22.0851

ANNEX D:
RANKING OF *RAYONS* BY POVERTY

Table 1: Distribution Poverty by *Rayon*

HEADCOUNT POVERTY (%)				
Marz	*Rayon*			
	< 25	25—35	35—45	> 45
Yerevan	Avan Kentron Davidashen Malatia-Sebastia Arabkir	Erebuni Nor Nork Kanaker-Zeytun Nork-Marash	Shengavit Adjapnyak Nubarashen	
Aragatsotn	Aparan Talin		Ashtarak	Aragts
Ararat		Artashat	Ararat Masis	
Armavir	Baghramyan	Armavir	Echmiatsin	
Gegharkunik		Vardenis	Karmir Martuni	Kamo Sevan
Lori	Spitak Amasia	Stepanavan Tashir	Gugark Tumanyan	
Kotayk	Abovyan		Nairi	Hrazdan
Shirak				Akhouryan Artik Ani Ashotsk
Sjunik	Goris	Meghri		Kapan Sisian
Vayots Dzor		Vayk Yeghegnadzor		
Tavush		Noyemberyan Idjevan	Tavush	

Table 2: Distribution Rural Poverty by *Rayon*

HEADCOUNT POVERTY (%)				
Marz	*Rayon*			
	< 25	25—35	35—45	> 45
Aragatsotn	Aparan Talin	Ashtarak		Aragts
Ararat	Artashat	Ararat Masis		
Armavir	Baghramyan	Armavir Echmiatsin		
Gegharkunik		Vardenis Karmir	Martuni Kamo	Sevan
Lori	Spitak Stepanavan Amasia Tashir Gugark		Tumanyan	
Kotayk	Abovyan		Nairi	Hrazdan
Shirak				Akhouryan Artik Ani Ashotsk
Sjunik	Goris	Meghri Kapan	Sisian	
Vayots Dzor		Vayk Yeghegnadzor		
Tavush		Noyemberyan Idjevan		Tavush

Table 3: Distribution of Urban Poverty *Rayon* (Districts)

HEADCOUNT POVERTY (%)				
Marz	*Rayon*			
	< 25	25—35	35—45	> 45
Yerevan	Avan Kentron Davidashen Malatia-Sebastia Arabkir	Erebuni Nor Nork Kanaker-Zeytun Nork-Marash	Shengavit Adjapnyak Nubarashen	
Aragatsotn		Aparan Talin		Ashtarak
Ararat				Ararat Artashat Masis
Armavir		Armavir		Echmiatsin
Gegharkunik			Vardenis Martuni	Kamo Sevan Karmir
Lori		Spitak	Tashir Gugark Stepanavan Tumanyan	
Kotayk	Abovyan		Nairi	Hrazdan
Shirak				Akhouryan Artik Ani
Sjunik	Meghri	Goris		Kapan Sisian
Vayots Dzor	Vayk Yeghegnadzor			
Tavush		Noyemberyan Tavush Idjevan		