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POVERTY IN THE SOUTH CAUCASUS

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Poverty in the South Caucasus

By Katy E. Pearce, Georgetown University, Washington DC

Abstract

This article provides an overview of the extensive poverty in the South Caucasus. It provides measures of income, employment, resource consumption, material deprivation, and access to utilities and durable goods. Factors like the development of fossil fuel resources in Azerbaijan, the “democratization” of Georgia, and the presence of a large diaspora outside of Armenia have not improved the situation for these countries.

Defining Poverty

What does it mean to be poor? Certainly, the definition of poverty is both complex and situationally- and culturally-bound. In particular, what it means to be poor in the United States or Western Europe is different from Ethiopia or Peru.¹ Acknowledging the conceptual and operational complexity of poverty, we use multiple poverty indicators from the Caucasus Barometer to understand poverty in Armenia, Azerbaijan, and Georgia. Income, access to utilities, and ability to consume durable goods are used to create a multidimensional understanding of poverty in the Caucasus.

We also look at regional differences within the Caucasus states. In Former Soviet countries, and in developing countries generally, the division between capital cities, regional urban cities, and rural areas is stark. Even during the Soviet period, with its alleged spatial equality between capital, urban, and rural areas,² urbanites were better off than rural people.³ And today, post-Soviet rural areas still face greater poverty⁴ (although rural households are often less food poor because of access to farming) (Falkingham, 1999), and poorer medical provisions, educational opportunities, and transportation access.⁵

To frame this study, we note the United Nations’ complex definition of poverty as “a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to, not having the land on which to grow one’s food or a job to earn one’s living, not having access to credit. It means insecurity, powerlessness, and exclusion of individuals, households, and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation.”⁶

The main findings of this study can be summarized in a few key points:

- Most people have very little money. The average monthly income for Azerbaijanis is US\$375, Armenians US\$275, and Georgians US\$175.
- The percent of citizens actively looking for work is 25% in Armenia, 21% in Azerbaijan, and 31% in Georgia.
- In 2010, 30% of Armenian and a quarter of Azerbaijani and Georgian households did not have enough money for food. An additional 37% of Armenian, 33% of Azerbaijani, and 42% of Georgian households did not have enough money for clothes. Only around 5% of Armenian and Georgian and 11% of Azerbaijani households can afford expensive goods like a DVD player.
- Only 63% of Georgian households have a refrigerator.

Income

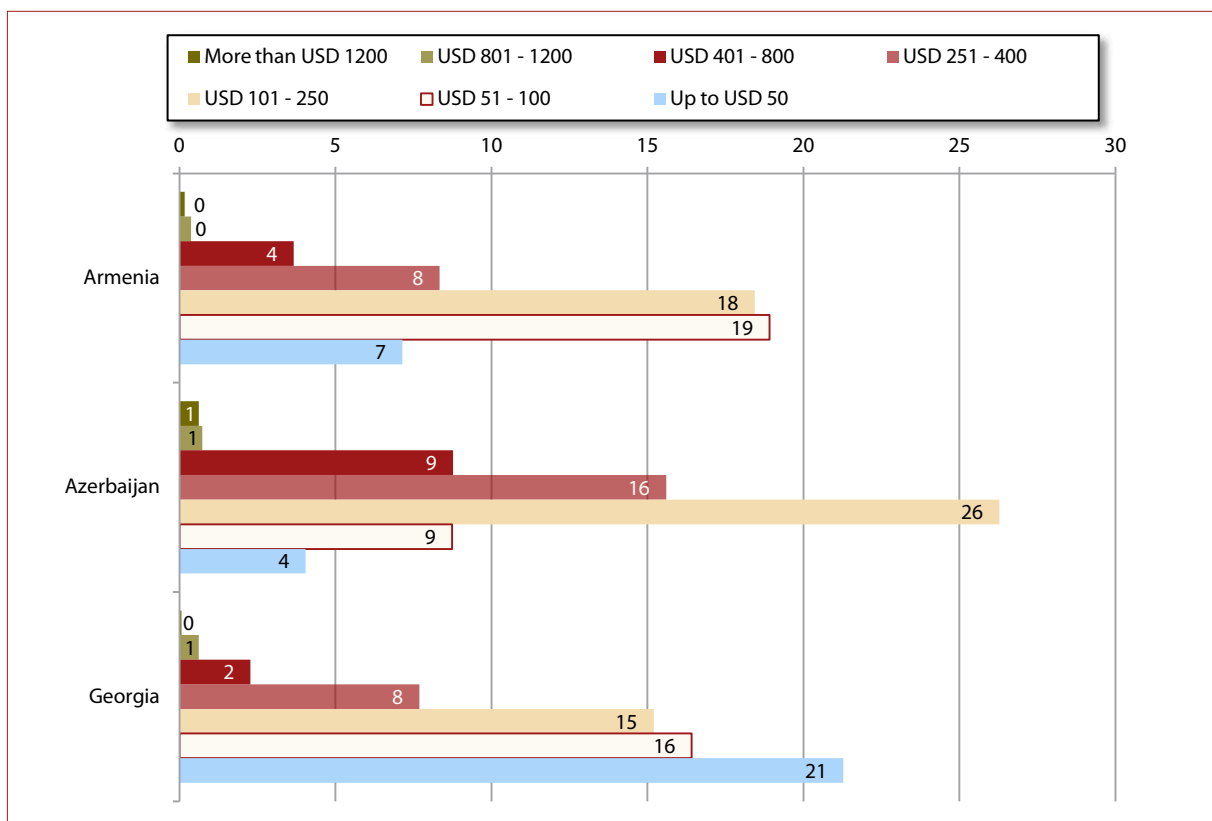
While some studies use *income* as the primary indicator of poverty, many argue that it is an incomplete measure of economic wellbeing and poverty.⁷ To give a sense of what Caucasus Barometer participants report as monthly house-

1 For cultural definitions of poverty see: Gordon, D., & Spicker, P. (1998). *The international poverty glossary*. London, New York: Zed Books.
 2 Liebowitz, R. (1992). Soviet geographical imbalances in Soviet Central Asia. In R. Lewis (Ed.), *Geographic perspectives on Soviet Central Asia* (pp. 101–131). London: Routledge.
 3 Dellenbrant, J. (1987). *The Soviet regional dilemma: Planning, people, and natural resources*. Armonk, NY: M.E. Sharpe, Inc.; Fuchs, R., & Demko, G. (1978). The post-war mobility transition in eastern Europe. *Geographical Review*, 68, 171–182.
 4 Falkingham, J. (1999). Measuring household welfare: Problems and pitfalls with household surveys in Central Asia. *MOCT-MOST: Economic Policy in Transitional Economies*, 9, 379–393. doi:10.1023/A:1009548324395
 5 Buckley, C. (1998). Rural/urban differentials in demographic processes: The Central Asian states. *Population Research and Policy Review*, 17(1), 71–89. Springer Netherlands. doi:10.1023/A:1005899920710
 6 United Nations. (1998). *Statement of commitment for action to eradicate poverty*. Retrieved from <http://www.unesco.org/most/acc4pov.htm>
 7 Deaton, A. (1992). *Understanding consumption* (Vol. 1). Oxford, England: Oxford University Press. doi:10.1093/0198288247.001.0001; Deaton, A. (2003). Measuring Poverty in a Growing World (or Measuring Growth in a Poor World). *National Bureau of Economic Research Working Paper Series*. Retrieved from <http://www.nber.org/papers/w9822>; Ringen, S. (2009). Direct and indirect measures of poverty. *Journal of*

hold income, we conducted a descriptive and comparative analysis to see the distribution of income in each country as well as a comparison between the three states. (The specific question was: Speaking about your personal monetary income last month, after all taxes are paid, to which of the following groups do you belong? Please think of all sources of income that you had last month. 1: More than USD 1200 2: USD 801 – 1200 3: USD 401 – 800 4: USD 251 – 400 5: USD 101 – 250 6: USD 51– 100 7: Up to USD 50).

Azerbaijan has a significantly higher mean monthly income than Armenia or Georgia and Armenia had a significantly higher mean income than Georgia. Thus, with statistically significantly mean scores (from a 1–7 scale, with 1 being highest) of 4.17 for Azerbaijan, 4.74 for Armenia, and 5.42 for Georgia, this can be loosely be interpreted as an average monthly income of US\$375 for Azerbaijanis, US\$275 for Armenians, and US\$175 for Georgians.

Figure 1: Monthly Income Distribution (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2010, <http://crrc.ge/caucasusbarometer/datasets/>
Income data is self-reported; there is a high refusal rate among respondents concerning this question.

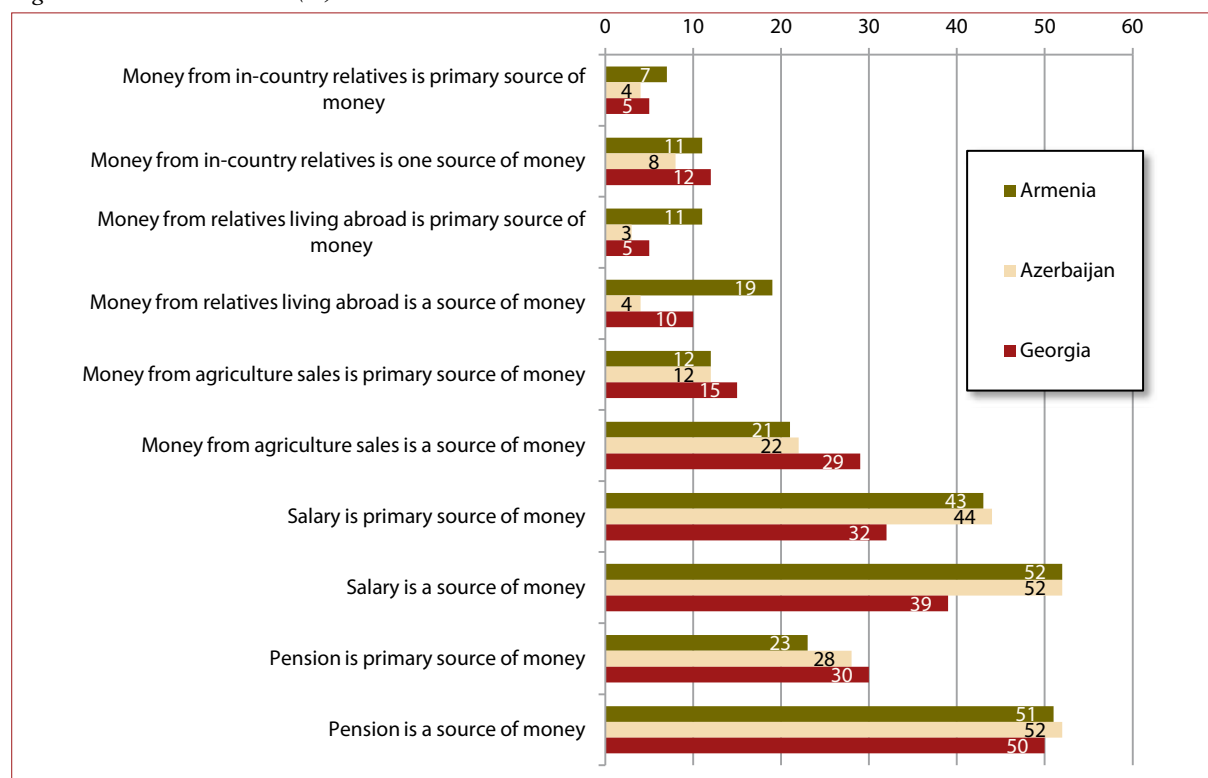
Figure 1 demonstrate that only in Azerbaijan income distribution is closer to a normal bell curve, although certainly the majority of people are in the middle three income categories. In Armenia and Georgia, the curves skew toward the poorer categories, with Georgia more heavily concentrated amongst the poorer categories and Armenia having a large number of respondents in the higher poorer categories.

Sources of Income

Households in the Caucasus depend on many sources of income. Salaries from jobs and pensions are the most common source of income, but many families also receive money from remittances from abroad, other family members within country, as well as agricultural sales. Georgians are less dependent upon salary as a source of income than Armenians or Azerbaijanis and more reliant on agricultural sales. Armenians are more likely to have relatives living abroad send-

ing money than Azerbaijanis or Georgians. Furthermore, Armenians are less likely to depend on a pension as a primary source of income than Azerbaijanis or Georgians are (Figure 2).

Figure 2: Income Sources (%)

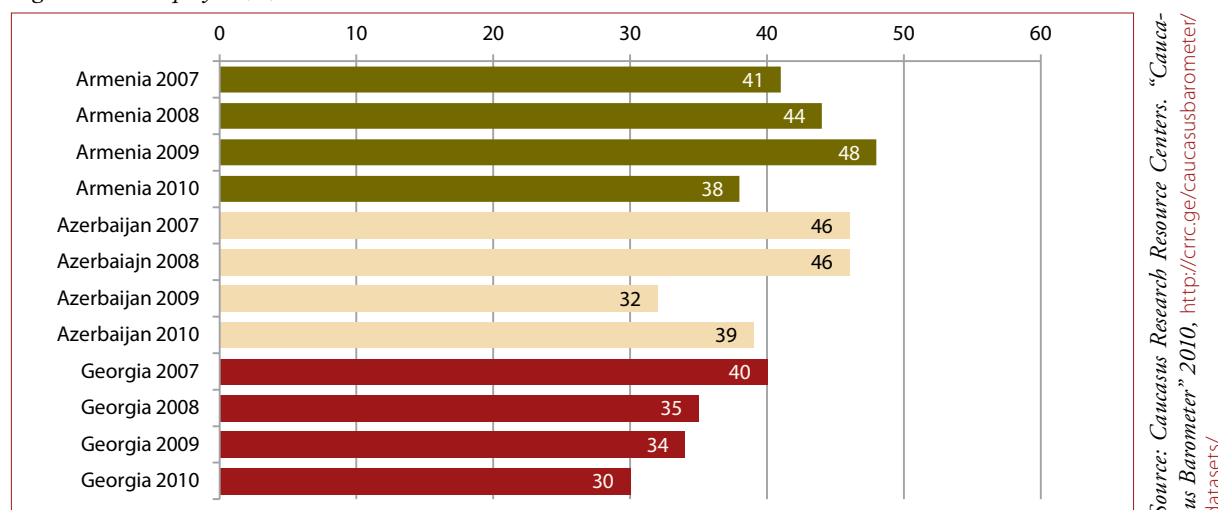


Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2010, <http://crrc.ge/caucasusbarometer/datasets/>; there is a high refusal rate among respondents concerning this question.

Employment

As salary is the most common source of income, an analysis of employment in Armenia, Azerbaijan, and Georgia is in order. On average, about a third of Caucasus citizens are employed. Figure 3 shows four years of data for each country.

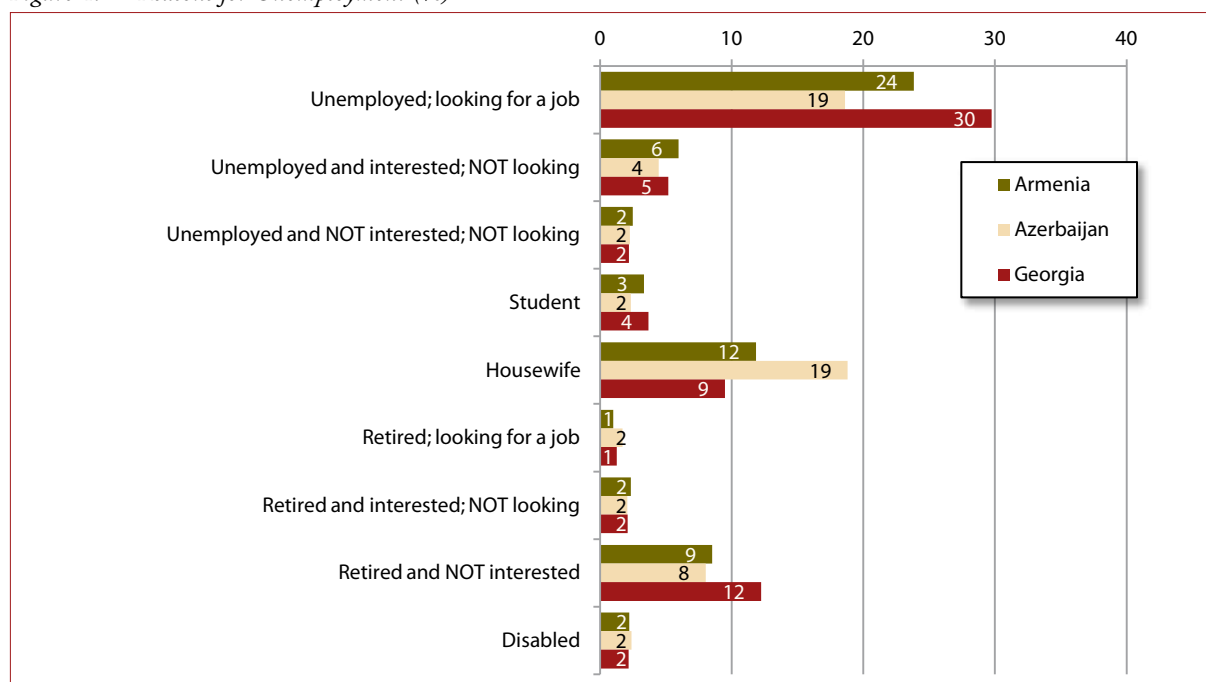
Figure 3: Employed (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2010, <http://crrc.ge/caucasusbarometer/datasets/>

But of those approximately two-thirds unemployed, only a quarter to a third are looking for employment. The rest of the unemployed are housewives, pensioners, students, or disabled. Thus, in 2010 the percent of citizens actively looking for work is 25% in Armenia, 21% in Azerbaijan, and 32% in Georgia, as Figure 4 indicates.

Figure 4: Reasons for Unemployment (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2010, <http://crrc.ge/caucasusbarometer/datasets/>

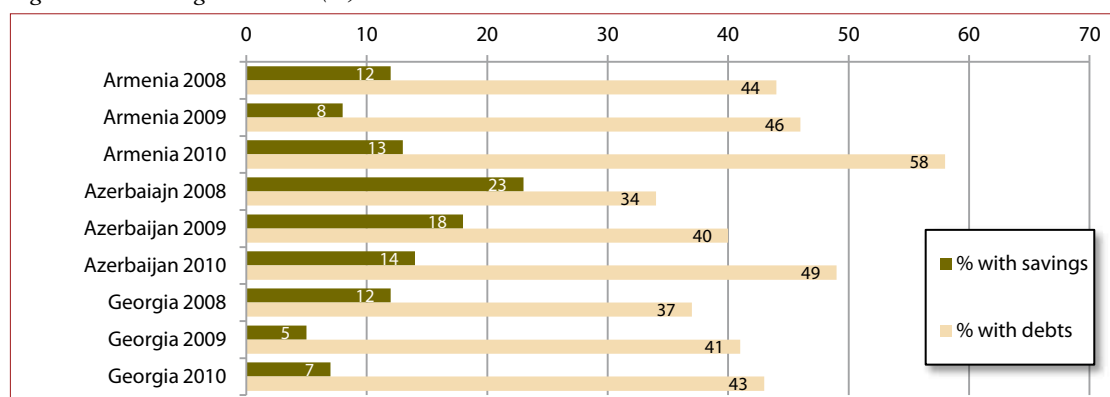
Compensation Satisfaction

However, those that are employed are not very satisfied with their salaries as few feel that they are fairly compensated for their work. In Armenia (in 2010), 72% felt unfairly compensated. In Georgia, 55% feel unfairly compensated. While in Azerbaijan only 40% felt unfairly compensated.

Debt

Many Caucasus households carry debt and few have savings (Figure 5). While there is not a strong relationship between debt and poverty, we have included these results in this analysis for a better understanding of household financial obligations.

Figure 5: Savings and Debt (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Resource Consumption and Material Deprivation

As the previous section demonstrates, salary is only one factor in a household's financial situation. Thus, we follow Sen and others who argue for direct measures to get at the actual standard of living that people experience through their ability to consume resources. A household that lacks resources is considered poor.⁸ This perspective is sometimes called *material deprivation*: "the lack of goods, services, resources, amenities and physical environment which are customary, or at least widely approved in the society under consideration."⁹

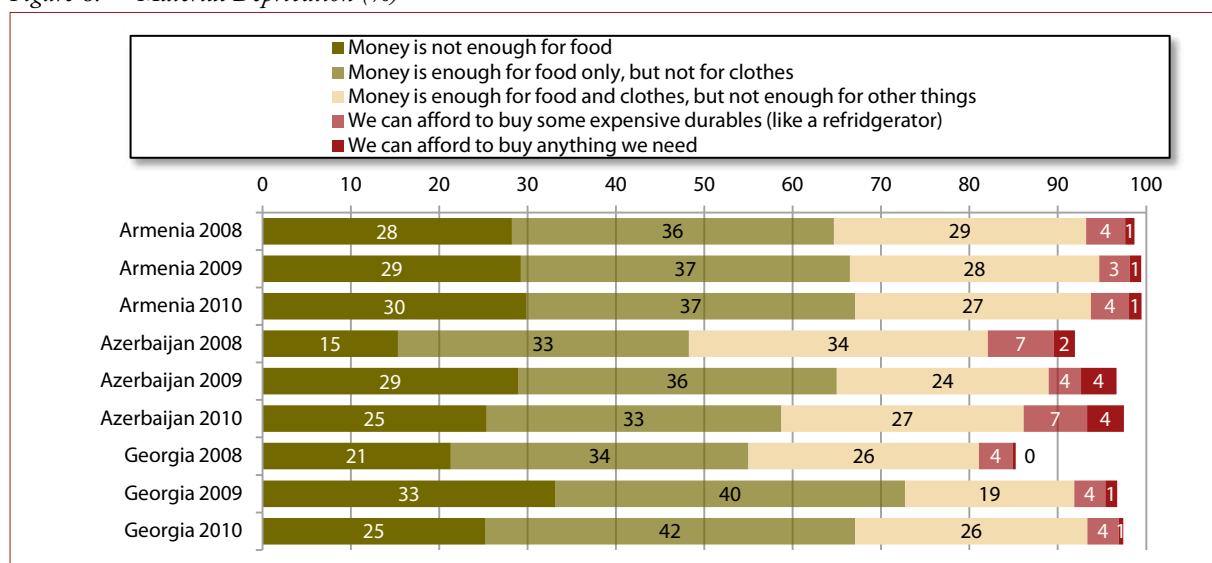
In studies of post-Soviet societies, while not explicitly citing material deprivation, many researchers have found that income is a poor measure of economic wellbeing and have noted that consumption-based measures are more appropriate in this context.¹⁰ Further, many such studies (mostly in public health) have used material deprivation as a measure of economic wellbeing.¹¹

Participants were asked to choose a statement that best described their family's financial situation: 1: Money is not enough for food, 2: Money is enough for food only, but not for clothes, 3: Money is enough for food and clothes, but not enough for expensive durables like a refrigerator or washing machine, 4: We can afford to buy some expensive durables like a refrigerator or washing machine, 5: We can afford to buy anything we need.

The distribution of material deprivation for Armenia, Azerbaijan, and Georgia 2008–2010 is seen in Figure 6.

Comparing between the three countries, Azerbaijanis were significantly less materially deprived than either Armenians or Georgians. There were no differences between Georgians and Armenians. However, 30% of Armenian and a quarter of Azerbaijani and Georgian households do not have enough money for food. An additional 37% of Armenian, 33% of Azerbaijani, and 42% of Georgian households do not have enough money for clothes. Only around 5% of Armenian and Georgian and 11% of Azerbaijani households can afford expensive goods like a DVD player.

Figure 6: Material Deprivation (%)



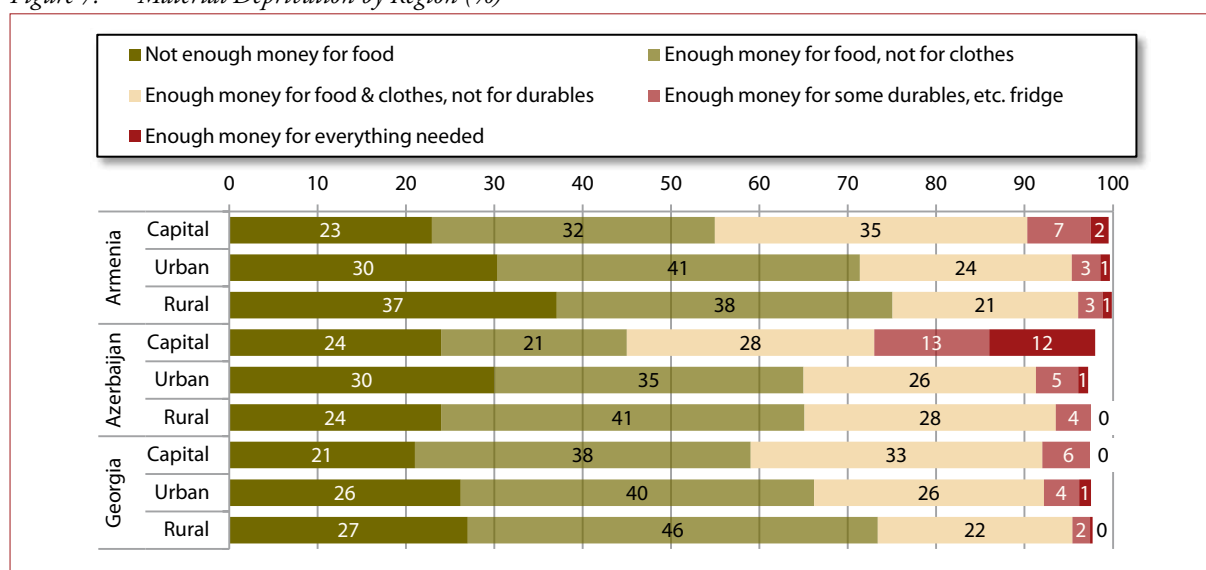
Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

- 8 Gordon, D., & Pantazis, C. (1997). *Breadline Britain in the 1990s*. Aldershot: Ashgate.; Gordon, D., Adelman, L., Ashworth, K., Bradshaw, J., Levitas, R., Middleton, S., Pantazis, C., et al. (2000). *Poverty and social exclusion in Britain*. Joseph Rowntree Foundation. Retrieved from <http://www.jrf.org.uk/publications/poverty-and-social-exclusion-britain>
- 9 Townsend, P., Phillimore, P., & Beattie, A. (1988). *Health and deprivation: Inequality and the North*. London: Croom Helm. p. 49
- 10 Falkingham, J. (1999). Measuring household welfare: Problems and pitfalls with household surveys in Central Asia. *MOCT-MOST: Economic Policy in Transitional Economies*, 9, 379–393. doi:10.1023/A:1009548324395; Kandiyoti, D. (1999). Poverty in transition: An ethnographic critique of household surveys in post-Soviet Central Asia. *Development and Change*, 30(3), 499–524. doi:10.1111/1467-7660.00127; Rose, R., & Mcallister, I. (1996). Is money the measure of welfare in Russia? *Review of Income and Wealth*, 42(1), 75–90. doi:10.1111/j.1475-4991.1996.tb00147.x
- 11 Demirchyan, A., & Thompson, M. E. (2008). Determinants of self-rated health in women: A population-based study in Armavir Marz, Armenia, 2001 & 2004. *International journal for equity in health*, 7, 25. doi:10.1186/1475-9276-7-25; Menchini, L., & Redmond, G. (2009). Poverty and deprivation among children in Eastern Europe and Central Asia. *International Journal of Social Welfare*, 18(3), 225–236. doi:10.1111/j.1468-2397.2008.00620.x

Within the Caucasus states there is a large difference between capital, regional cities, and rural ability to consume (Figure 7).

In all three countries, capital city residents were significantly more able to consume, followed by regional cities, and rural residents are the least able to consume. Few very rural residents have the ability to consume beyond essential needs. With the high proportion of unemployment and low education in rural areas, however, it is not merely *living in a rural area* that causes poverty. Rather, rural areas contain more individuals living in poverty.

Figure 7: Material Deprivation by Region (%)



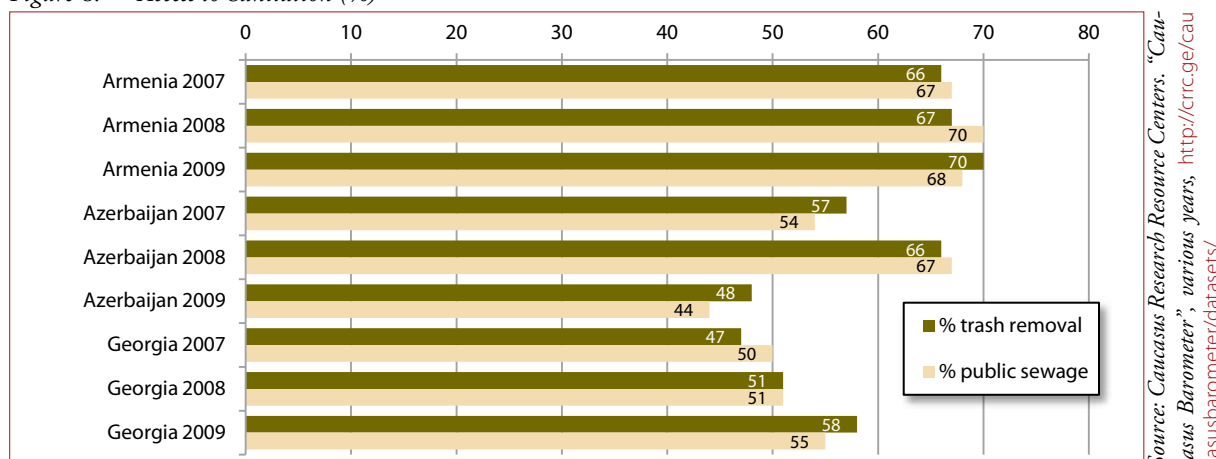
Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2010, <http://crrc.ge/caucasusbarometer/datasets/>

Utilities

Sanitation

The United Nations (1998) includes lack of access to sanitation as an indicator of poverty. And while the Caucasus Barometer stopped measuring access to trash removal and public sewage in 2009, based on 2007–2009, about two-thirds of Armenians, a little less than half of Azerbaijanis and a little over half of Georgians have trash removal and public sewage (Figure 8). However, the relationship between the self-reported household economic situation and access to trash removal and public sewage is weak (although statistically significant) in all three countries. Thus, access to sanitation is not a good indicator of poverty.

Figure 8: Access to Sanitation (%)

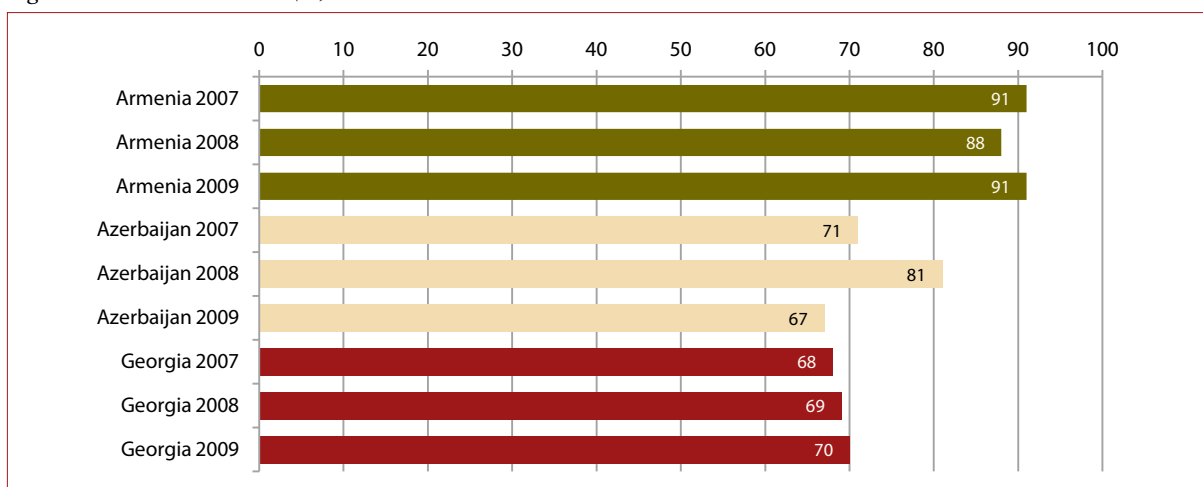


Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Water

The United Nations also includes a lack of access to clean water in its definition of poverty. In the Soviet period water distribution infrastructures were developed and today function to varying degrees and thus we do not expect access to water to be as strong of an indicator of poverty. Unsurprisingly then, most Caucasus households have pipeline water. In Armenia, a large majority of households have access to pipeline water. In Azerbaijan and Georgia, though, less than three-quarters of households have pipeline water (Figure 9). However, the relationship between self-reported household economic situation and access to pipeline water is weak (although statistically significant) in all three countries. Thus, access to pipeline water is not a good indicator of poverty.

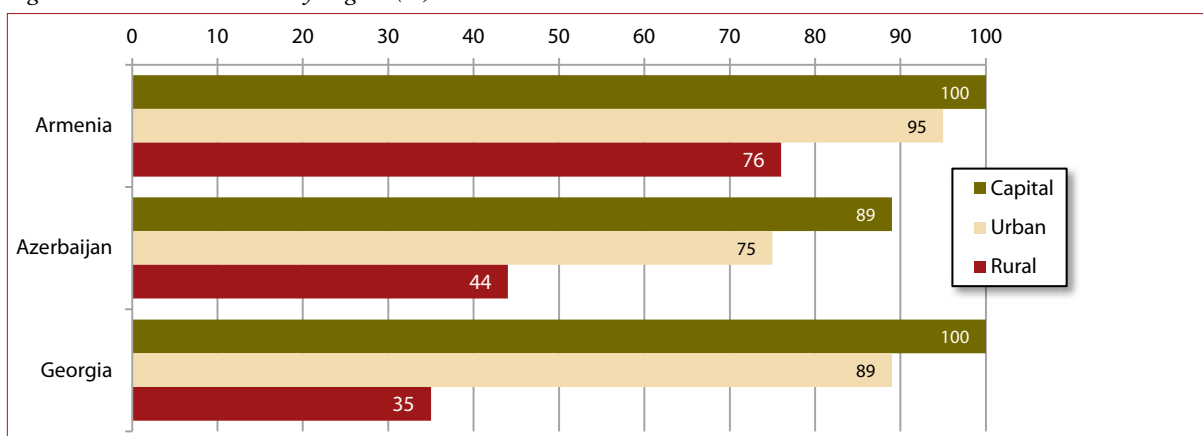
Figure 9: Access to Water (%)



Source: Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Nonetheless, there are stark differences between capital, regional city, and rural residents (Figure 10). Most noteworthy is Georgia where only 35% of rural residents have pipeline water. In Armenia a little over three quarters of rural residents have pipeline water and in Azerbaijan only 44% have pipeline water (although many rural residents likely have well water).

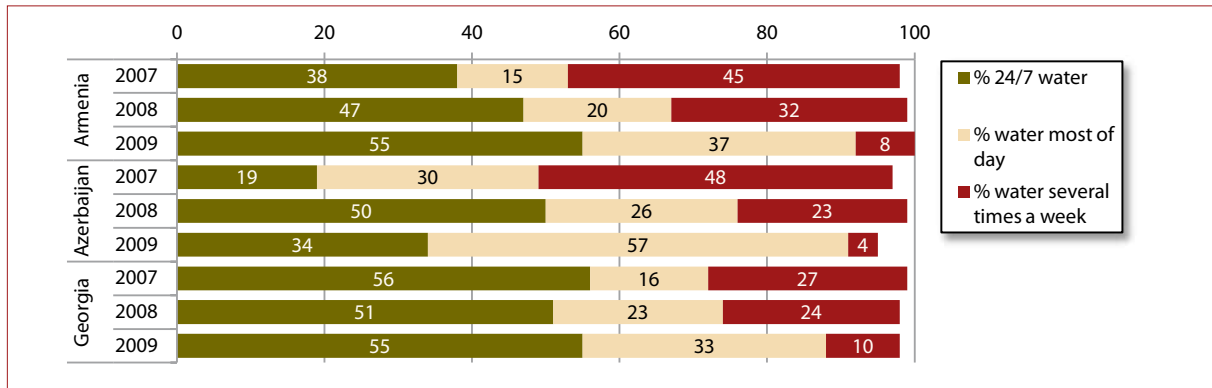
Figure 10: Access to Water by Region (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer" 2009, <http://crrc.ge/caucasusbarometer/datasets/>

But access to pipeline water is more complicated than access or no access. Only about a third to one half of Caucasus households have access to water all day. In 2009, 8% of Armenian households, 4% of Azerbaijani households and 10% of Georgian households only had water a few hours each day (Figure 11). Inconsistent access to water complicates a household's ability to prepare meals, wash clothing, and bathe.

Figure 11: Frequency of Access to Water (%)

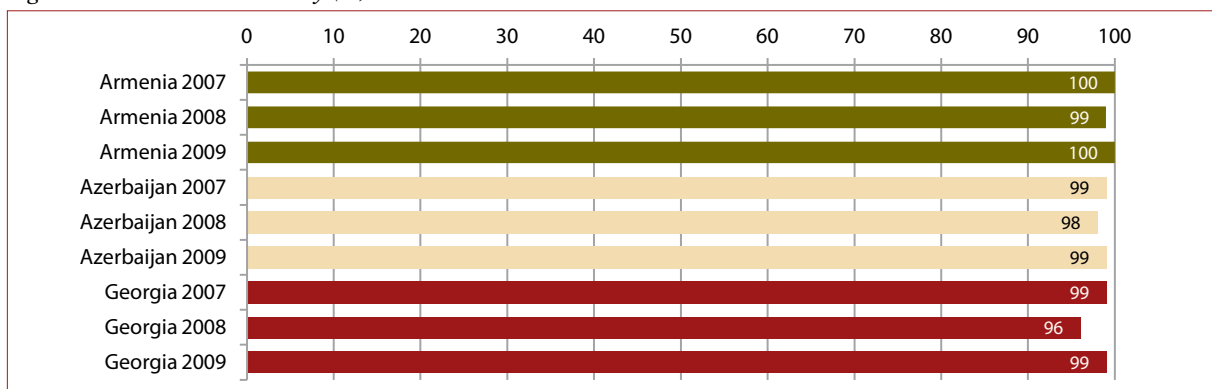


Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Electricity

Nearly all households in the Caucasus have access to electricity and there are no regional differences (Figure 12). Thus it is an inappropriate proxy for poverty.

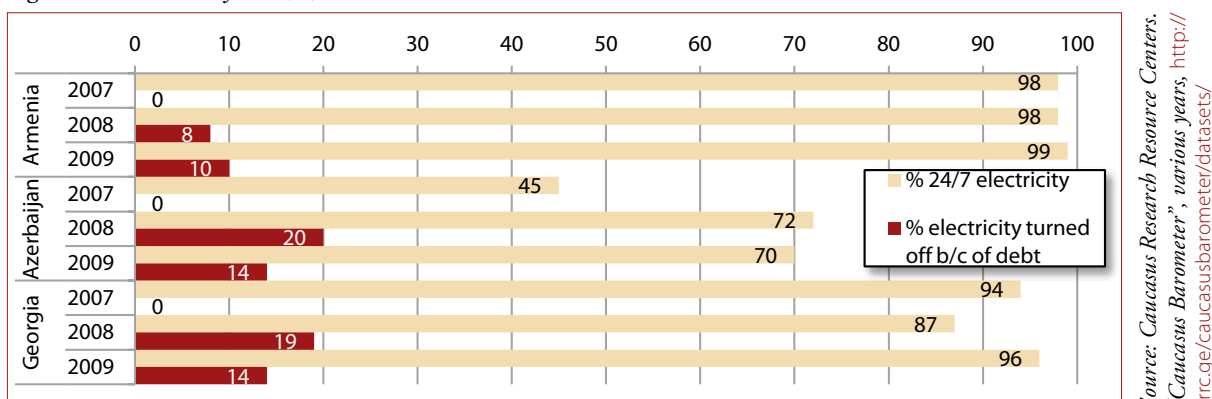
Figure 12: Access to Electricity (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

However, like pipeline water, electricity comes infrequently for some. In Azerbaijan only 70% of households have access to electricity for the entire day (Figure 13). And while most have electricity, it is important to note that some Caucasus households are unable to pay their electricity bill and have had their power shut off (Figure 13).

Figure 13: Electricity Use (%)

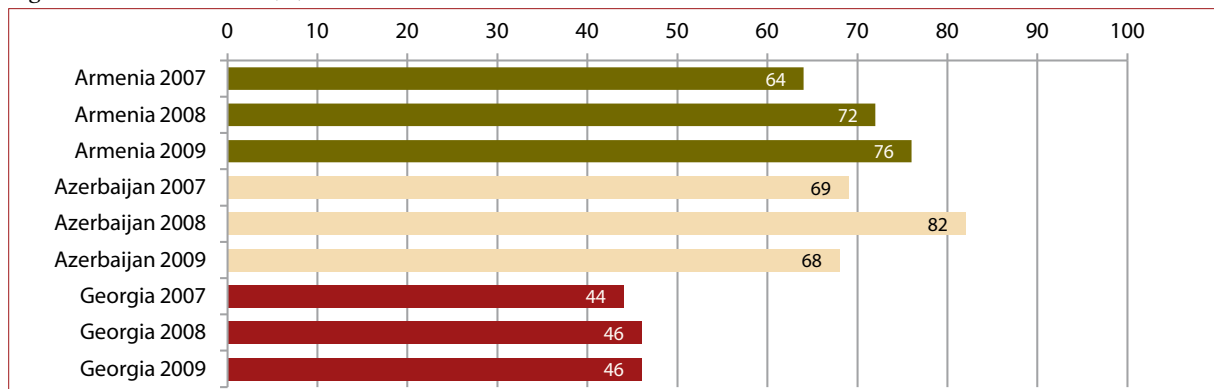


Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Gas

There is a great deal of variance between the Caucasus countries' access to gas (Figure 14). Only 44% of Georgians have access to gas while about three-quarters of Armenians and Azerbaijanis do. However, this may be due to different options for heating a home such as electricity or wood and non-gas ovens in Georgia. Because of the regional differences, we do not consider lack of access to gas to be a good proxy for poverty.

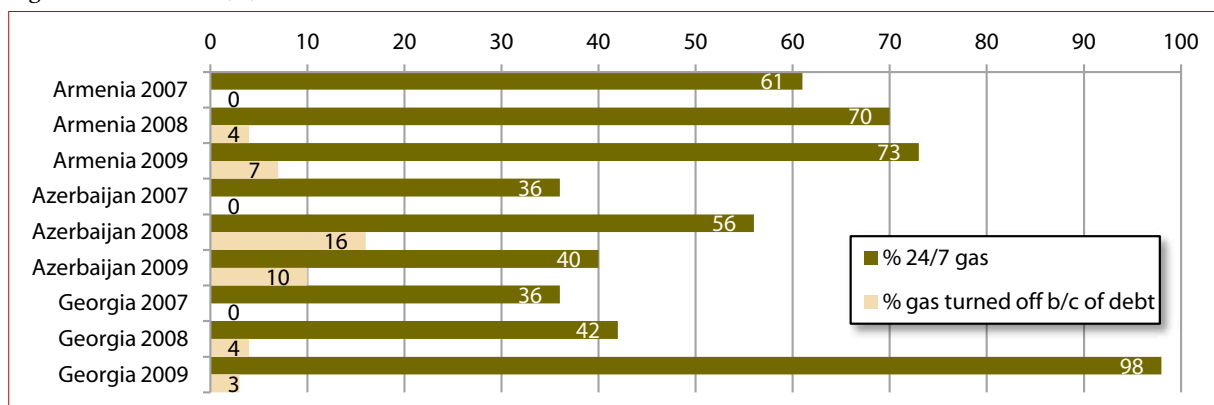
Figure 14: Access to Gas (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Nearly everyone with gas has access for the entire day (Figure 15). And while many have gas, it is important to note that some Caucasus households are unable to pay their gas bill and have had their gas shut off (Figure 15).

Figure 15: Gas Use (%)



Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Durable Goods

Ownership of goods is an additional factor in understanding a household's ability to consume.

Appliances

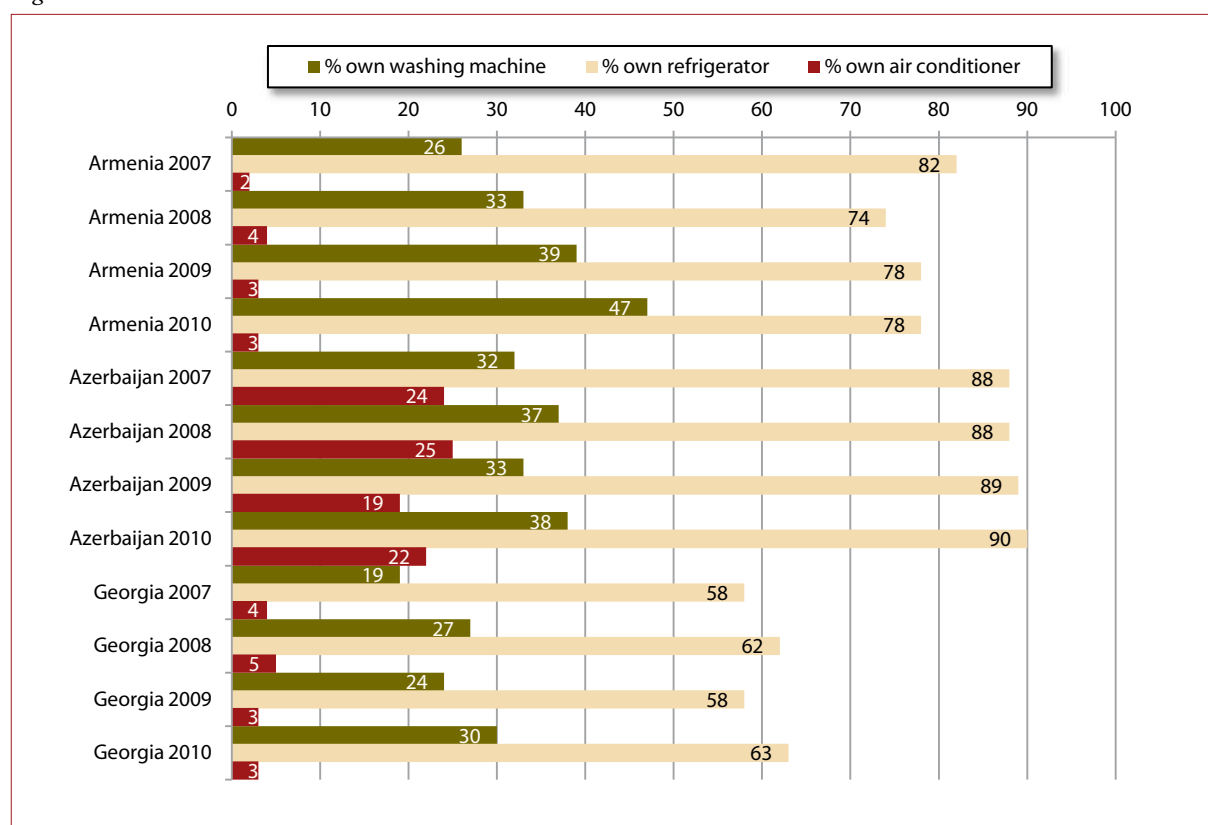
Household appliances can have a significant impact on household functioning. Refrigerators allow for an entirely different type of food to be consumed and allows for perishable food to be purchased in bulk and stored, which saves money. As we consider a refrigerator as the least luxurious appliance and the appliance with the highest overall ownership, it is notable that only 63% of Georgian households own one (although it is possible that those households have an icebox or use a neighbor's) (Figure 16). However, compared to Armenia and Azerbaijan where a large majority of households do possess a refrigerator, this is a concern for Georgia. Moreover, lack of ownership of a refrigerator appears to be a good indicator of poverty. The relationship between self-reported household economic situation and

ownership of a refrigerator is fairly strong in all three countries (correlations: 0.22 in Armenia 2010, 0.17 in Azerbaijan 2010, 0.23 in Georgia 2010).

A clothes washing machine can reduce the time spent on housework, freeing household members to engage in employment. A little less than half of Armenian households, a little over a third of Azerbaijani households, and almost a third of Georgian households have a washing machine (Figure 16). The relationship between self-reported household economic situation and ownership of a washing machine is strong in all three countries (correlations: 0.35 in Armenia 2010, 0.32 in Azerbaijan 2010, 0.35 in Georgia 2010).

Few Armenians and Georgians own an air conditioning unit (Figure 16), while about a quarter of Azerbaijanis do (Figure 17). Ownership of an air conditioner is fairly strongly related to self-reported household economic situation. (Correlation: 0.22 in Armenia 2010, 0.17 in Azerbaijan 2010, 0.23 in Georgia 2010). The weather in the three countries is fairly similar although Armenian and Georgian homes are more frequently built from stone versus wood in Azerbaijan, thus there may be differences in need for an air conditioning unit.

Figure 16: Durable Goods

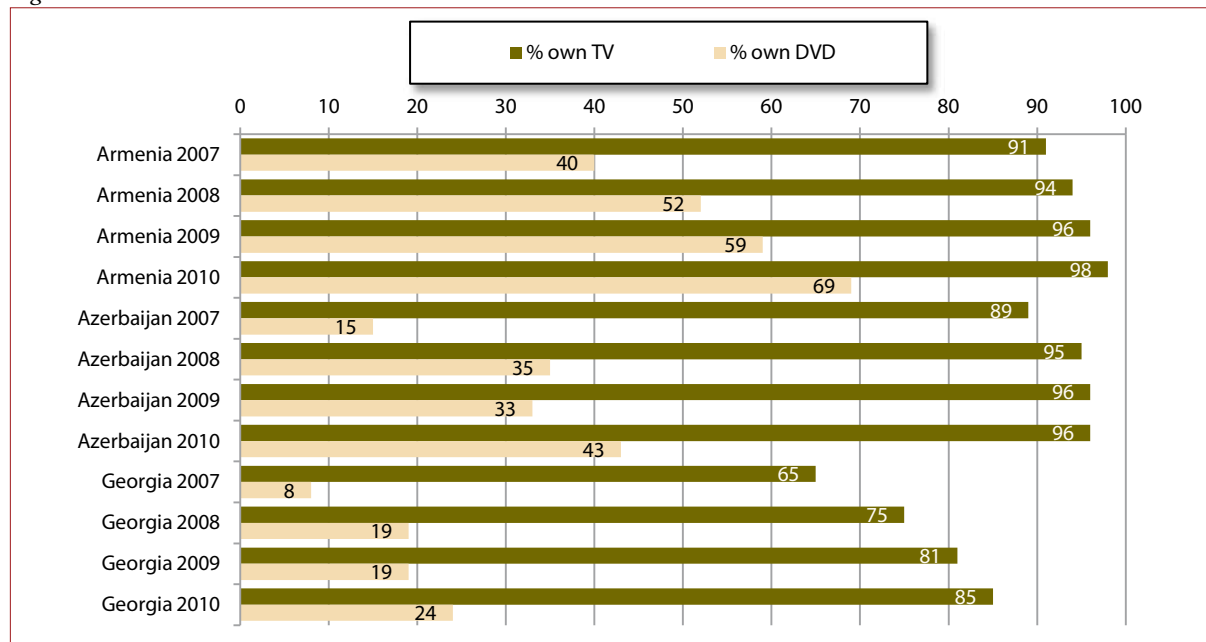


Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

TV/DVD

And while some would consider television and DVD players luxury goods, many Caucasus households own them (Figure 17). However, while nearly all Armenians and Azerbaijanis own television sets, only 85% of Georgians do now and in 2007 less than two-thirds of Georgian households had a television set. DVD players are less common than television sets, but in 2010, over two-thirds of Armenians, 43% of Azerbaijanis, and a little less than a quarter of Georgians had DVD players.

Figure 17: TV/DVD



Source: Caucasus Research Resource Centers. "Caucasus Barometer", various years, <http://crrc.ge/caucasusbarometer/datasets/>

Conclusion

Many are concerned with widening inequality in the Caucasus.¹² This analysis demonstrates that the vast majority of Armenian, Azerbaijani, and Georgian households are experiencing poverty. Moreover, equality is a state of social organization that gives equal access to resources and opportunities to all its members,¹³ thus inequality exists when members do not have the ability to access resources and opportunities. Certainly many in Armenia, Azerbaijan, and Georgia *do not* have access to resources and opportunities.

What is to be done? Each country has a Poverty Reduction Strategy Plan that has been met to varying degrees of success. Georgia has "democratized" and yet still faces great poverty. Azerbaijan has come into great oil wealth and while its citizens are slightly better off than their neighbors in Armenia and Georgia, a large majority still lives in poverty. Armenia has diaspora support as well as a large international aid community, neither of which has improved its poverty outlook. This study does not claim to have the answers to these larger questions. However, the level of poverty that Caucasian households are experiencing from multiple perspectives does allow for those with the ability to make change (government, NGOs, civil society) to see how seriously their citizens are suffering.

About the Author:

Katy E. Pearce is an adjunct professor at Georgetown University's Communication, Culture, and Technology Program.

- 12 Falkingham, J. (2005). The end of the rollercoaster? Growth, inequality and poverty in Central Asia and the Caucasus. *Social Policy and Administration*, 39(4), 340–360. Retrieved from <https://www.southampton.ac.uk/socsci/socstats/research/papers/Falkingham-SPA2005.pdf>; Fan, L., & Habibov, N. (2008). Targeting social assistance in Azerbaijan: What can we learn from micro-data? *International Journal of Social Welfare*, 17(4), 346–354. doi:10.1111/j.1468-2397.2008.00553.x; Glinkina, S. P., & Rosenberg, D. J. (2003). The socioeconomic roots of conflict in the Caucasus. *Journal of International Development*, 15(4), 513–524. doi:10.1002/jid.1000; Habibov, N. (2010). An intertemporal evolution of inequality in Azerbaijan, 1995–2002. *Problems of Economic Transition*, 52(9), 51–77. doi:10.2753/PET1061-1991520904; Habibov, N. (2011). Public beliefs regarding the causes of poverty during transition: Evidence from the Caucasus, Central Asia, Russia, and Ukraine. *International Journal of Sociology and Social Policy*, 31(1/2), 53–74. doi:10.1108/01443331111104805; Habibov, N., & Fan, L. (2007). Social protection and poverty in Azerbaijan, a low-income country in transition: Implications of a household survey. *International Social Security Review*, 60(4), 47–68. doi:10.1111/j.1468-246X.2007.00280.x; Kharatyan, H., Babajanian, B., & Janowski, M. (2003). *Sustaining rural livelihoods: A report on farming And non-farm activities In three communities In Armenia*. London. Retrieved from <http://www.nri.org/projects/rnfe/pub/papers/2727.pdf>; Spoor, M. (2005). Inequality, poverty and conflict in transition economies. *Globalisation, poverty and conflict* (pp. 47–65). New York: Kluwer Academic Publishers. doi:10.1007/1-4020-2858-X_4
- 13 May, J., Woolard, I., & Klasen, S. (1997). *The measurement and nature of poverty and inequality*. Retrieved from <http://www.info.gov.za/otherdocs/1998/poverty/nature.pdf>

Poverty in Azerbaijan

By Nazim Habibov, Windsor, Canada

Abstract

Azerbaijan's economy collapsed after the dissolution of the Soviet Union, but then grew rapidly as energy resources came on line. The new wealth reduced overall poverty rates, but the benefits were not spread evenly among the population, with older people, women, and refugees suffering the most. One of the most effective anti-poverty reforms was the privatization of land. While Azerbaijan has made considerable progress in poverty reduction, more needs to be done to reduce the level of inequality in the country.

A Rollercoaster Transition

Even before the Soviet Union collapsed, Azerbaijan was one of its poorest republics. Nevertheless, the transition in Azerbaijan began earlier than in other parts of the country. The conflict with neighboring Armenia over the Nagorno-Karabakh enclave had led to a transportation blockade and a breakdown in economic cooperation with other Soviet republics as early as 1988. The deep economic recession after the collapse of the USSR in 1991 was followed by an influx of Azerbaijani refugees from Armenia, Nagorno-Karabakh, and the regions around it. Between 1992 and 1994, real GDP declined as much as 20% and inflation drove prices to 23,000 times their previous levels.

However, by the mid-1990s, the economy began a slow, but steady, process of recovery with loans from multinational financial institutions and the inflow of foreign direct investments to the oil industry. Consequently, inflation fell to 20% by 1996, and even turned into deflation by 1998. The economy stopped shrinking by 1996. By 2002, Azerbaijan had begun to experience one of the fastest rates of economic growth among the CIS countries. The country's GDP has increased every year since 1996. By 2001, Azerbaijan's exports outside the former USSR reached 90% of total exports and the fiscal deficit dropped below 1%. The index of real wages (1998=1) reached 2.3 in 2003.

Improving Conditions

Macro-economic stability coupled with accelerated economic growth improved the population's welfare. From 2001 to 2008, public spending increased from 20% to 70% of non-oil GDP, the minimum wage increased by more than 6,700%, and the average wage increase exceeded 650%. As a result, per capita income jumped by over 90% from 2001 to 2005 and further skyrocketed by 100% from 2006 to 2008, exceeding \$3,800.

Poverty, as measured by the national poverty line, dramatically plummeted from 76% to 49% from 1995 to 2002. According to the most recent estimates, poverty further declined to 13% by the end of 2008. Consumption by the poorest quintile (the lowest 20% of

total population) grew from 6.7% to 12.3% of total consumption from 1995 to 2002. To better understand the impressive poverty reduction achievement of Azerbaijan, it is instructive to compare it with the neighboring countries using the international poverty line of 2.15 USD purchasing power parity (PPP) per day. The poverty rate declined in Azerbaijan to 4% by 2003. In comparison, poverty in 2003 was much higher in the neighboring Armenia—50%—and Georgia—52%.

Uneven Spread of Benefits

However, gains from accelerated economic development and poverty reduction have not spread evenly to all groups of the population. The younger generation, 18–29 year olds, appear to benefit more from the transitional processes. There are two main explanations for this phenomenon. First, there is a rapid depreciation of human capital during transition. The transitional labor market in Azerbaijan has more opportunities for employees with professional skills, for instance, the ability to operate a vehicle, the knowledge of a foreign language, or the ability to work with modern information technology. These skills can be acquired through short-term education and professional training at work (e.g. foreign language and computer skills). Nevertheless, the current educational system in Azerbaijan still emphasizes classic multiyear academic training, overlooking continuing education, while the majority of employers are also not prepared to offer continuing education opportunities for their personnel. Second, the transitional survival strategies of younger and older individuals are different. The younger individual will more likely switch from a career in his or her previous official profession to newly-emerging highly-paid informal income generation strategies. Conversely, older individuals with more education and experience are less likely to switch to any new job opportunities, especially if these opportunities are informal ones such as private tutoring or turning your car into a taxi.

Although the education system is only poorly connected to the labor market and the revival of the education system in Azerbaijan lags behind other transi-

tional countries, education remains a strong predictor of higher welfare. A university degree has the largest positive impact on increasing income, while the effect of vocational education is lower. Hence, investing in human capital could be an important poverty reduction strategy. However, the poor often do not have access to educational opportunities. Children in poor households have fewer opportunities to enroll in early childhood education and development programs and are more likely to drop out of compulsory school education. They have fewer resources to hire private tutors who can help pass the mandatory national exam required to matriculate to universities. Since the introduction of tuition fees, many youth from poor families cannot afford higher education and have to enter the labor market immediately after high school. Consequently, ensuring equal access to education and reforming the educational system continue to be challenges in Azerbaijan.

Women are also among those who benefitted less from the transition. In 1990, women constituted almost half of the workforce, while only 1 in 6 women of working age in urban areas were employed by 2004. The level of economic activity among females is 51%, while among men this indicator exceeds 75%. In the 25–39 age group, the likelihood of women being inactive in the workforce is 5 to 6 times higher than that of men. There are several explanation for this phenomenon. Employers are reluctant to hire a female employee who is likely to go on maternity leave, or to ask for sick leave to care for children. In addition, the number of kindergartens has dropped considerably during the transition, while fees per child have significantly increased. Many women have to stay home to care for their children. Similarly, as government-funded social programs for the sick, disabled, and elderly have been cut significantly, women have had to spend more time at home to compensate. Moreover, family members often discourage women from pursuing a professional career. But, even if a woman is employed, she is likely to earn less than a man inasmuch as women are traditionally concentrated in the state-sector where wages are low. For instance, women constitute 57% and 69% percent of the total workforce in social services and education, and 76% in healthcare. Furthermore, even in the fields where women typically are better represented, men occupy the more senior and better-paid positions. In health care and social services, for example, women's salaries comprise of only 54% of men's.

Another population group at highest risk of poverty are the internally-displaced people (IDP) from Nagorno-Karabakh and related territories. This category of the population lacks employment opportunities and has to rely on government transfers as the main source of

income. The IDPs who reside in public dwellings are relatively better off compared to those who reside outside of public dwellings by renting accommodations or living with relatives. The former group benefits more from targeted government and non-government programs aimed at helping IDPs, while the latter constitutes a group of the “invisible” poor.

The households with a larger number of dependents are also disadvantaged. The reduction in public expenditures for programs aimed at dependents, such as children, the elderly, sick, and the disabled, led to an increase in the share of households' out-of-pocket expenses. The ineffective system of social protection transfers further exacerbates the situation. Benefits are often inadequate to lift households out of poverty. But even these modest benefits are not well targeted to the neediest.

Successful Land Reform

In comparison, land reform was one of the few effective measures to reduce poverty. Before the reform, access to land was one of the strongest predictors of wealth. Although legally there could not be private farms in Azerbaijan in the early 1990s, access to the land of decaying collective farms was the mainstay of unofficial economic activities in rural areas. Managers of the former collective farms would unofficially privatize or rent land and equipment and charged fees for others to use these resources. The common view in the rural areas was that the collective farms were being looted. A small group of the affluent were able to exploit all the others by monopolizing access to the land. Those with access to land achieved a higher quality of life by selling their goods on the market.

Under these circumstances, Azerbaijan opted for radical land reform. The country privatized 95% of all arable land, which left only 5% of land in state ownership. In comparison, in Armenia the state land reserve is about 15%, while in Georgia it is about 40%. Similarly, about 98% of eligible households received land during the reform in Azerbaijan compared with 60% in Bulgaria and 37% in Kazakhstan. Moreover, the process of distributing land in Azerbaijan was perceived as fairer than in other countries. About 92% percent believed that land distribution in Azerbaijan was fair and just compared with only 60% in Kazakhstan, 65% in Bulgaria, and 53% in Moldova. As a result of the fair distribution of land, having access to land ceased to be an important determinant of joining the ranks of the rich in Azerbaijan by 2002.

Another important dimension of poverty is regional. Urban areas experienced higher rates of poverty reduction than rural ones, while among urban areas, the oil-booming capital Baku experienced more significant pov-

erty reduction than any other urban area. Although Baku has a lower level of poverty than other regions, the gap between the capital and the rest of the country has narrowed during the last 5–6 years. Uneven regional poverty reduction is explained by the lack of a unified nationwide labor market, poor infrastructure (e.g. unreliable water, gas, and electricity supply, and the lack of reliable transportation), as well as the lack of mechanisms to connect government expenditures by region to specific regional priorities.

Poverty Metrics

The main critique of current poverty reduction metrics is that they utilize an absolute poverty line, whether it is the national poverty line or the international poverty line of 2.15 USD PPP per day. Although poverty dropped in Azerbaijan as measured by these metrics and is now much lower than in the neighboring countries, the comparative subjective assessments of well-being portray a very different picture. About 14% and 35% of Azerbaijan's population consider themselves very poor and poor. This is close to the 14% and 34% of Georgians who consider themselves very poor and poor. Likewise, about 10% of Azerbaijan's population believes that their household belongs to the lowest strata of society as compared with 12% of the population in Georgia. These data demonstrate that people in Azerbaijan, as in many other countries, have a tendency to measure their own

poverty in comparison with the economic situation of friends, co-workers, and neighbors across the country. In other words, regardless of Azerbaijan's impressive absolute poverty reduction, it is now time to pay attention to relative poverty and inequality.

Indeed, approximately 55% of Azerbaijan's population believes that poverty is caused by factors beyond the direct control of individuals, such as the failure of the socio-economic system or a lack of equal opportunities in society. Only 22% believe that bad luck is the main cause of poverty and 11% believes that causes of poverty are individualistic such as loose morals, lack of effort and responsibility, and drunkenness. The widespread acceptance of the structural explanation for poverty highlights the existing support for poverty and inequality reduction strategies. It is not surprising against this backdrop that 87% believe that the state should be strongly involved in reducing the gap between the poor and the rich.

In the light of the above evidence, we can conclude that Azerbaijan achieved remarkable progress in poverty reduction since the collapse of the Soviet Union and the beginning of the transition. Nevertheless, much more needs to be done. The main agenda for reforms includes increasing the effectiveness of the educational system and ensuring equal access to education; improving the social protection system and restoring social services for children, the sick, disabled, and elderly; gender mainstreaming poverty reduction, and reducing regional inequalities.

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Understanding Poverty in Georgia

By Alexi Gugushvili, Cambridge, MA

Abstract

Over the last two decades, the profile of the poor has been evolving in Georgia, but the poverty level has remained consistently high. If the official subsistence minimum is taken as the poverty line, slightly more than two-fifths of the population is poor according to the latest estimations. Arguably, persisting high poverty levels can be explained by jobless economic growth and low agricultural productivity. The institutionalisation of a targeted social assistance scheme has yet to demonstrate its efficacy. Instead of using perverse estimates of relative poverty, the government should acknowledge deprivation as the major challenge for the country and must more eagerly attempt to cure its root causes—inappropriate human capital and narrow labour markets.

Poverty Profile in Making

The poverty profile, which describes the typical charac-

teristics of the poor, has been in constant flux in transitional Georgia. The analysis of the Central and Eastern

Eurobarometer, to our knowledge the earliest nationally representative survey data since independence, reveals that in the beginning of the 1990s respondents' education and, contrary to popular beliefs, age did not affect the probability of being poorer. On the other hand, women and the residents of urban areas were more, while farmers, along with professional job holders, less likely to find themselves on the bottom of the income distribution ladder. It is also important to remember that just before the transition started, Georgia was lagging behind other Eastern European Soviet republics with higher poverty levels, and therefore certain social groups were already experiencing poverty before the crisis arrived.

In the second half of the 1990s, the poverty profile was evolving along with political, economic and social transformations. A higher proportion of the urban population still was poorer, however the incidence of poverty in rural areas began to vary in relation to adverse weather conditions. Males continued to have lower chances of being poor than females. It also appears that owning assets did not affect the poverty much as most of the households maintained TVs and refrigerators. One of the main explanations of poverty was how many persons had to live on each breadwinner's income. Age started to correlate with poverty, and by the year 2000, children were the group with the highest poverty risk. The most disadvantaged became those who could not qualify for formal and informal social safety nets and at the same time were excluded from market opportunities that required geographic mobility and physical health.

In the more liberalised environment, since 2004, labour market status and educational attainment started to become increasingly important for avoiding poverty. Households headed by wage earners experienced the lowest, while households headed by unemployed or inactive individuals the highest poverty rates. Among the employed, self-employment and agricultural employment was associated with the highest poverty risk. Anything less than technical and vocational education was associated with significantly higher chances of being poor. In addition, the levels of poverty started to vary considerably across different regions. Last but not least, the households with the greater number of children were particularly in danger of being worse off, while for the first time there was an indication that female-headed households did not face higher poverty risk.

Absolutely Relative or Relatively Absolute?

The government started to evaluate poverty levels in 1997 with the Survey of Georgian Households. From the beginning, there were conflicting ideas about establishing an absolute poverty threshold which would distinguish the poor from the non-poor. Two suggested pov-

erty lines included an official line based on the nutrition norms inherited from the pre-independence period and a new recommended line based on a revised minimum food basket. In 2000 poverty by the official minimum and recommended lines reached up to 51.8 and 23.1 percent, respectively. However, after 2004, the new government decided to switch to a relative measure of poverty which defined the poverty level as a share of the population with incomes less than 60 percent of median consumption. This step literally overnight halved the poverty level to 24.6 percent in 2004 from the previous year's estimate of 54.5 percent without changing real welfare conditions on the ground.

Nevertheless, international institutions such as the World Bank, UNICEF, and the European Commission, continued to estimate absolute poverty levels. Based on their assessments, we can conclude that if there had been a decline in the absolute poverty level in 2003–2005, no major changes have occurred thereafter. If we use the subsistence minimum as the poverty threshold, then 41.2 percent of households were poor in 2009 (see Table 1). The conclusion that poverty is not retreating and continues to be a major problem facing Georgian society is confirmed by alternative international survey projects, such as the Life in Transition Surveys and the Caucasus Barometer. The latter dataset for 2010 indicates that 44 percent of households could only afford to buy food, 33 percent felt that their real incomes were lower than in 2009, while 18 percent had to limit consumption of bread (for more indicators of deprivation and their comparison with other South Caucasian countries see Pearce's contribution in this edition).

Evolving Welfare Mix

Detailed discussion and research on poverty in Georgia first took place during the elaboration of the Economic Development and Poverty Reduction Program in the beginning of the 2000s. This was followed by the baseline report on the Millennium Development Goals. But since 2004 most attention has been paid to economic growth as the end rather than the means of development. The declining importance of poverty in the public policy framework can be seen in the scarcity of attention paid to the major poverty-related progress reports.

However, the centrality of poverty was acknowledged at two critical junctures of socio-political life. First, after the 2007 social unrest and the resultant presidential campaign 'Georgia without Poverty' became the title of the government's program for 2008–2012. Second, as a result of the Russo–Georgian war in 2008 and the negative outcomes of the world economic recession, the country's appeal to international donors was largely based on actual and expected poverty consequences from the crisis.

In more practical terms, social schemes have been only a small fraction of the existing welfare mix employed to mitigate the problem of poverty. Public employment, migration, petty trade, family support networks and clans constituted its main pillars, especially in the 1990s. Not only had the government done little to help the poor directly but in some cases poverty was aggravated by the accumulation of arrears on salaries, pensions, and other social expenditures. Since 2004, the revolutionary governments employed, what seemed to be on first sight, a reasonable strategy. The downsizing of the public sector increased the welfare of the remaining public employees, while fighting corruption reduced the unfair distribution of resources, on a more general level. The same concept was later applied to the reforms of the social protection system, which sought to eliminate inefficient social benefit schemes and mobilise resources on a few better targeted welfare programs. Still, no major changes occurred in social expenditures' absolute and relative share in the total budget and GDP.

The assumption that the free market would allocate efficiently the existing labour force, reduce the deprivation level and decrease the need for public intervention did not quite live up to expectations. Those who were fired from the public sector had difficulties finding jobs in the private labour market at a time when the increasing official unemployment rate reached 16.9 percent in 2009. Most plausible explanations for this is the jobless economic growth driven mainly by trade services, construction and financial intermediation—the sectors which did not generate many new jobs and were also heavily affected by the macro-crisis from 2008. Nonetheless, maybe the most consequential aspect for poverty was the enduring inefficiency of the agricultural sector which greatly suffered by losing its major export market in Russia since 2006. All these developments cumulatively increased the need for formal social programs among a larger share of the population.

The government's answer to new welfare concerns was the system of targeted social assistance (TSA) introduced in 2006. The number of beneficiaries has been slowly increasing to 12.8 percent of all households in the beginning of 2011. Although, the estimations suggest that TSA reaches the poorest well and increases their disposable income, its overall effect on the poverty level is not clear-cut. The available assessments for 2007 show that TSA accounted for about a 1 percentage point reduction of poverty. In comparison, pensions lead to a 9 percentage point reduction. It is reasonable to think that the impact of TSA has increased in more recent years as it currently covers at least 50 percent more individuals than in 2007. (In fact, Unicef reports that TSA pulls 4 percent of the population above the

61.1 GEL per person poverty line.) It also has to be mentioned that the discontinuation of other social programs meant that TSA is also employed to address social risks derived from long-term unemployment, possessing low or obsolete skills, single parenthood, and the like.

'Lest We Forget'

It is important to remember that in Georgia the fortunes of people largely depend on circumstances beyond their control. There are no doubts that poverty is an intergenerational phenomenon, which means that those people who come from disadvantaged families are much more likely to end up in poverty themselves. Indeed, the available data indicate that intergenerational stratification was high in Soviet Georgia and sharply intensified since the 1990s. This means that some social groups for various reasons, such as the decline of certain occupations, erosion of skills and direct involvement in military confrontations, became poorer than those groups which avoided these shocks. It is reasonable to expect that in the long-run poverty will be, at least partially, reproduced among a new generation of 'old' poor unless the links between parents' and children's socioeconomic status are weakened through more equal access to assets important for life chances, such as skills and education.

The current transparent enrolment practices in higher education solve only a small part of the greater puzzle. Research has shown that the initial formation years are much more important for children's educational performance, which means that investment in pre-primary, primary and secondary education can have a much higher effect on poverty reduction. Relying only on TSA neither creates conditions, nor provides potential for overcoming poverty in the long-run, because the system was not designed to remedy the major determinants of poverty. Because only about one fourth of applicants actually receive benefits, the participants might feel privileged to be part of the system and do not expect or demand other more fundamental assistance. On the other hand, the state should not consider that its obligations are fulfilled towards the poor but instead social investments should be increased in kindergartens, schools, training programs, active labour market policies, as the most sustainable way to minimise poverty levels in the future.

Concluding Remarks

Our analysis of primary and secondary data revealed that poverty is increasingly shaped by traditional stratification factors such as education and labour market status. Although this shows a potential for overcoming poverty, it also indicates that it is a challenging and lengthy process. More research is required to understand what are

the precise mechanisms through which the disadvantages are generated and sustained. Newly available international survey data might be extremely helpful for this purpose, especially when the national official channels of data are restricted. So far the most notorious aspect of research has been the confusion over appropriate poverty levels. The observed tendency that the private labour market cannot absorb the available labour force indicates

a need for greater public involvement in human capital formation, especially among children and youth and the provision of targeted vocational training for adults. Last but not least, society as a whole must not overestimate the role of TSA, but rather should untiringly seek ways through which the poor and their offspring will overcome poverty and have equal opportunities to lead productive lives according to their interests.

Table 1: *Absolute and Relative Poverty Levels Estimated by Different Agencies in 1997–2009, Percent of the Population*

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Official subsistence minimum*	46.0	50.0	52.0	51.8	51.1	52.1	54.5	–	–	–	–	–	–
Recommended poverty line**	13.7	19.8	23.2	23.1	–	–	–	–	–	–	–	–	–
Relative poverty level*	–	–	–	–	–	–	–	24.6	24.1	23.3	21.3	22.1	21.0
Official subsistence minimum***	–	–	–	–	–	–	–	–	41.4	43.0	46.0	40.4	41.2
Monthly 122.2 GEL, 2.5 USD per day****	–	–	–	–	–	–	–	–	–	–	–	–	41.5

Sources: * Government of Georgia (2011), ** World Bank (2002), *** European Commission (2011), **** UNICEF (2010), UNDP (2004). Pre- and post-2004 official minimum poverty levels still are not comparable because the value of minimal basket was reduced in 2003. The estimating institutions are shown in parentheses.

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References

- CAUCASUS RESEARCH RESOURCE CENTERS 2010. *Caucasus Barometer*. Tbilisi: Caucasus Research Resource Center.
- EUROPEAN COMMISSION 2011. *Social protection and social inclusion in Georgia*. Directorate-General for Employment, Social Affairs and Inclusion.
- GOVERNMENT OF GEORGIA 2011. *Inequality indicators Standards of Living, Subsistence Minimum*.
- GUGUSHVILI, A. 2010. Towards a welfare research framework in the countries of Eastern Partnership Initiative. *Journal of East European and Asian Studies*, 1, 351–381.
- GUGUSHVILI, A. 2011. Social Stratification in Less Successful Post-socialist Societies: Twenty Years After. *The 10th Conference of the European Sociological Association*. Geneva, Switzerland.
- MATARADZE, T. 2011. Is the state social or the computer inhuman? Claims for state support and citizenship in post-socialist Georgia. *Citizenship Studies*, 15, 471–484.
- REIF, K. & CUNNINGHAM, G. 1993. Dataset: Central and Eastern Eurobarometer 3 (Political Desintegration). GESIS—Leibniz Institute for the Social Sciences, Cologne, Germany.
- UNDP 2004. *Millennium Development Goals in Georgia*. Tbilisi: United Nations Development Programme
- UNICEF 2011. *Georgia and the Convention of the Rights of the Child: An update on the situation of children in Georgia*. Tbilisi, Georgia: United Nations Children's Fund.
- UNICEF 2010. *How do Georgian Children and their Families Cope with the Impact of the Financial Crisis? Report on the Georgia Welfare Monitoring Survey, 2009*. Tbilisi: UNICEF Georgia, University of York.
- WORKING GROUP ON POVERTY REDUCTION AND EMPLOYMENT 2009. *Poverty Reduction and Employment: Diagnostic Report*. Tbilisi: Task Force for Regional Development
- WORLD BANK 1999. *Georgia: Poverty and Income Distribution*. (In Two Volumes) Volume 1: Main Report. Washington, D.C.: Poverty Reduction and Economic Management Unit, Europe and Central Asia Region.
- WORLD BANK 2002. *Georgia: Poverty Update*. Poverty Reduction and Economic Management Unit, Europe and Central Asia Region.
- WORLD BANK 2009. *Georgia: Poverty Assessment*. Human Development Sector Unit, South Caucasus Country Unit, Europe and Central Asia Region.

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