**A Contribution to Serbia's
Poverty Reduction Strategy**

Defining Criteria for
Underdeveloped Municipalities

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<u>Acknowledgments</u>

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Executive Summary

The need for further statistical evaluations of characteristics of poverty in Serbia, especially at the municipal level, is evident. Municipal development is generally not a very well researched topic, but it is essential that all economic research on poverty and underdevelopment be based on sound statistical evidence. Some noteworthy efforts have been made, but there are great problems with data availability at municipal level, as well as a lack of thorough understanding of the dynamics of Serbia's regions/municipalities and regional socio-economic development. This study looks at the available data to measure municipal underdevelopment, and identifies an organisational approach to measuring development of municipalities. It presents a set of indicators to measure municipal underdevelopment, and provides a data set for most of the presented indicators. It also ranks municipalities according to the selected criteria, gives recommendations for future data collection practices and points out that collection of data on social development needs to be monitored more closely. Taking into account data limitations encountered throughout the project, it should primarily serve as a reference point for further research and analyses in this direction.

Introduction

Objectives of research

The main goal of this analysis is the development of a methodology to <u>measure current conditions as well as prospective welfare of municipalities</u>. The subject of this study is the comparison of (under)development among municipalities of Serbia. The study attempts to measure the main dimensions of (under)development of Serbian municipalities. To achieve that, it examines a whole spectrum of socio[1]-economic indicators. It is also important to distinguish between underdevelopment and poverty. These two terms are highly correlated, but should not be used interchangeably. The relatively less developed municipalities are likely to contain a higher proportion of people with low incomes, but not necessarily of absolutely poor individuals. Hence, we take poverty into account, but our objective is to measure (relative) underdevelopment.

Deliverables of research

1. An organisational framework for analysing municipal development.
2. A set of indicators for measuring the relative development of municipalities.
3. A database of indicator values and rankings of municipalities in DevInfo 4.0
4. Four annexes analysing the following in greater detail: rurality, census data, evaluation of indicators, and the results of rankings.
5. An annex with the list of people we communicated with.

Methodology of research

This analysis has been mostly based on primary sources of information, such as interviews and discussions with relevant stakeholders (a list of which has been annexed to the study), as well as databases of Serbia's data collecting institutions. In addition, development literature and international experiences have been used to strengthen the arguments used.

The study posits that the development of a municipality can be expressed as a "welfare function" with three broad clusters of arguments: (1) a Material Welfare Index, (2) A Non-material Welfare Index, and (3) a Prospective Welfare Index. The Material Welfare Index and the Non-material Welfare Index were then aggregated into a Current Welfare Index, and the Current Welfare Index and the Prospective Welfare Index were aggregated into the final Welfare Index.

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[1] When we say social indicators, we refer to indicators of education, health and income poverty, rather than social cohesion indicators commonly used in the EU and OECD literature, such as crime rates, teenage pregnancies, drug use, etc.

Since the various indices were expressed in different units, we standardised them using the methodology of the Human Development Index (HDI) of the UNDP. We found the minimum and maximum values for each variable, and then we applied the following formula:

$$I = \frac{X_i - \min(X)}{\max(X) - \min(X)} \tag{1}$$

where I is the obtained index and X_i is the value of the measured indicator for municipality i. In this way, we obtained indices between zero and one for each indicator. We then aggregated them into one indicator of welfare. Not having an objective basis for determining the weights used in the aggregation, we assigned the various indicators equal weights. Using a different set of weights can lead to changes in rankings, although this seems not to be the case for municipalities at the top and bottom of the rankings. Further research into alternative weights, such as through the use of multivariate analysis (principal components/factor analysis) could thus be beneficial.

The final set of indicators was based on the organisational framework presented above and on reasoning detailed later in the study. In the end, the set is severely constrained by the availability of data at the municipal level. Also, even though we analysed correlations between the variables used in the final set, we did not omit any of the available indicators. The reasoning for that is that even if two or more variables are correlated, they still each add some unique information. It is also important to point out that causality relationships between various dimensions of development are not being examined for the purpose of this study, since they are not necessary for determining a cross-sectional point-in-time comparison of underdevelopment between municipalities. For example, it may be that bad roads in a municipality are a cause of underdevelopment, or a consequence of underdevelopment. The important thing for this study is that if the roads in a municipality are bad, they are a sign of current underdevelopment, as well as a potential impediment for future development.

Organisational Framework

While development is a complex concept giving rise to a vast literature, there seems to be no particular "off-the-shelf theory" of municipal development that this study could rely on. Taking into account that this analysis focuses on a given territory with shared values and shared recent experience, and that we are observing a limited time frame for the specific purposes of measurement and comparison of municipalities, we can leave aside the broad issues of various dimensions and definitions of development and focus on loosely defining a municipality as more developed if the welfare function of its population is at a higher level of satisfaction. In order to obtain some sort of a measure of the welfare function of a population it is important to consider the following issues:

1. What do we mean by improved welfare and how can we measure it? Within the welfare function it is important to observe *material wellbeing*, or more specifically, we would like to know how much income people living in a municipality have at their disposal, or how much they consume, depending on which of them is better measured. While data on disposable income can inadequately account for natural production of agricultural households, data on consumption leaves savings out of the equation.[2] As we currently do not have the data on consumption and income at municipality level, we resorted to using proxies[3]. This is where we will introduce production, as an important aspect of material welfare and the key source of sustainable income in the longer run. Under ideal conditions, production[4] would be the perfect proxy for disposable income, since 'production = income = consumption + savings'. In fact, the reason why we are interested in total disposable income is to explain why consumption of a given group of people is often higher than their production, when it should be lower than production by the amount saved. This situation of (seeming) "dissaving" can easily occur when the inhabitants of a municipality receive substantial official transfers and/or private remittances. This may or may not be sustainable sources of income, as it is typically more sustainable to live off of one's own production than depend on transfers from third parties (e.g. government, relatives). Therefore, sources of income that do not come from own production should be valued less, especially when it comes to looking at prospective welfare of an individual. For example, a person selling goods in their own shop has more probability for a sustainable source of income than somebody living off of remittances from relatives in Germany. However, measuring disposable income is difficult, especially when observing such a small unit of analysis as a municipality, where disposable income is a result of complex economic interactions and social networks. Therefore, we have had to estimate people's material welfare through

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[2] See Annex 1 for a more detailed discussion on problems between using income and consumption as measures of material welfare

[3] In statistics, a proxy variable is something that is probably not in itself of any great interest, but from which a variable of interest can be obtained. In order for this to be the case, the proxy variable must have a close correlation with the variable to be inferred. E.g. country of origin or birthplace might be used as a proxy for race.

[4] Under production, we do not only refer to material production, but anything an individual produces, including services.

production and consumption. In addition, it is also important to consider dimensions of *non-material welfare,* such as health and education, since such goods and services contribute to human well-being at least as much as purchasable goods, and are an important complement to material wellbeing. In conclusion, as the aim of this analysis, we would like to capture two arguments of welfare in the best way possible: what we shall refer to as *material arguments of welfare* and *non-material arguments of welfare.*

2. In principle, inequality in individuals' capacity to consume goods and services should be an important consideration when measuring level of development within a municipality. The more the consumption is representative of a greater number of individuals, the better, since the probability of extreme poverty in such a municipality would be lower. However, measures of welfare normally show an average, be it consumption or disposable income, for all households within the observed territory (in this case, a municipality), and therefore do not account for inequality. The fact that one individual consumes 0 and the other consumes a 100 units of a good, will show the level of consumption at 50 units per capita on average, and this situation will seem the same as when these same individuals consume 50 units of the good each. Equally, to someone unemployed, the unemployment rate of "only" 8% in their municipality is irrelevant. For them the unemployment rate is 100%. Lacking appropriate data, this study was not able to address the issue of inequality.

3. Another important aspect of the welfare function is time, in terms of it being important to determine future prospects of an individual. The point-in-time analysis of the welfare function will tell us about the current living conditions in a municipality, but surely our welfare also depends on our capacity to satisfy our needs in the future. If an individual fell below the poverty line once he lost his job, he is better off if he is younger, in good health and with some education, since he has more chance to lift himself out of poverty than if he were illiterate and of ill health. One should consider these factors when observing the level of development of a municipality as well. We need to ask the following question: are the sources of income in this municipality sustainable? Transfers are not as sustainable as earned income, even though they may help one live a comfortable life for the time being. Capital in all its forms (e.g. human – education and demography; physical – infrastructure etc.) is a fundamental base for future production of sustainable income, and in that context, we will also look at the types of capital at each municipality's disposal in order to determine their prospective welfare functions.

Inspired by the theoretical discussion above, the organisational framework has been reduced to material and non-material arguments of the welfare function for the purpose of analysing current conditions of municipalities. These two dimensions will help us rank municipalities according to their current conditions. We will then complement the analysis with another component whose task will be to estimate prospective welfare of municipalities. Finally, we will merge the two components into one composite index – the Welfare Index. The organisational framework will thus consist of the following:

1. <u>Current welfare of municipalities</u>

1.1. Material arguments of the welfare function

1.1.1. Production side
  - ➢ Indicator: Net Domestic Material Product.

1.1.2. Consumption side
  - ➢ Indicators: Municipal Expenditure, Electricity Consumption, Completed Housing Units.

1.2. Non-material arguments of the welfare function

1.2.1. Health
  - ➢ Indicators: Primary Care Providers, Infant Mortality Rate.

1.2.2. Education
  - ➢ Indicators: High School Enrolment, Educational Attainment, School Quality.

1.2.3. Environment
  - ➢ No available data for indicators.

1.2.4. Leisure
  - ➢ No available indicators.

2. <u>Prospective welfare of municipalities</u>

2.1. Municipality performance forecast

  - ➢ Indicator: Material Welfare Index[5] growth rate.

2.2. Types of capital at municipality's disposal

2.2.1. Financial capital
  - ➢ Indicator: Access to Financial Services.

2.2.2. Human capital
  - ➢ Indicator: Population Aging Index.

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[5] Material Welfare Index is made up of 4 indicators used under material arguments of the welfare function.

2.2.3. Physical capital
- ➤ Indicators: Telephone Connections, Road Index.

2.2.4. Social capital
- ➤ No available indicators.

2.2.5. Natural capital
- ➤ No available indicators.

Each heading from the above figure as well as our methodology is described in greater detail in the text below.

1. **Current welfare of municipalities**

1.1. Material arguments of the welfare function

Material arguments of the welfare function reflect material wellbeing, and their quantity directly depends on the disposable income of a municipality. We would therefore like to know as much as we can about disposable income of the municipality. Preferably, we would look at measurable income and consumption of all individuals living in that location, but we do not have data on income and consumption of individuals or households at municipal level. Therefore, we were guided by the logic of choosing proxies which would bridge this data gap in the best way possible. The function of material wellbeing can be improved either through higher production (through acquired income from production) or higher consumption (we would ideally have data on both government and private consumption, i.e. G + C).

1.1.1. Measuring welfare through the production side

Indicator: Net Domestic Material Product (NDMP) per capita

The best available measure for the production side of the welfare function is a Marxist proxy for GDP that we translate as Net Domestic Material Product (NDMP). This is the 'National Income[6]' measure used by the Republic's Statistics Office (RSO). In our opinion it is a misnomer that can cause confusion. In a market economy, national has different implications from domestic, and these differences are not negligible, especially at the municipality level, as already described above (the difference between GDP and GNP). The NDMP is based on the concept of material production accounting, which is a narrower concept than production as measured in GDP[7]. It is currently the best proxy for GDP we have in

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[6] Narodni dohodak (ND)

[7] NDMP for enterprises is based on the data from their financial reports and other book-keeping records, and for agricultural households and private shops, it is based on special surveys conducted at annual level. NDMP encompasses the following activities: agriculture, hunting and forestry, fishing, mining and quarrying, manufacturing, electricity, gas and water supply, construction, wholesale and retail trade, repair, hotels and restaurants, transport, storage and communications, real estate activities, renting, health and social work (only veterinary services and professional rehabilitation of invalids) and other community, social and personal service activities.

Serbia at municipality level, but there are many problems with the use of this indicator. For example, it omits some of the service sector (small entrepreneurs, e.g. hairdressers, as well as the entire financial sector, e.g. banks, consulting etc.), as well as the entire government sector. However, it is important to note that it accounts for agriculture, thus avoiding underestimates in rural areas.

By adding a consumption dimension to our measure of material wellbeing, we will adjust the rankings we get from NDMP, by estimating contributions to disposable income not covered in the NDMP.

The reason to use NDMP is that it is the closest measure we have to municipal GNP. It is important to explain the differences between GNP and GDP, for a better understanding of why we use NDMP when estimating our welfare function. The differences between GNP and GDP have very different implications at the national in comparison to the municipal level. GDP refers to total goods and services produced within a nation's geographical boundaries, regardless of the nationality of the producer, whereas GNP refers to total goods and services produced by nationals of a country, regardless of their location of production. While the difference between GNP and GDP at the national level is usually not very significant, it becomes a lot more relevant when we compare the two at the municipal level. It will not happen that all people from one country work in the neighbouring country, but there may be quite a few cases where people from one municipality will work in the neighbouring municipality. Because of a higher level of interaction between residents of neighbouring municipalities, it is a lot more complicated to compare economic indicators of development across municipalities, than having a cross-country comparison. Along those lines, if we had the required data, we would be interested in estimating GNP instead of GDP since we would rather know who owns the production, i.e. who gets the benefits from that production (in terms of wages, profit etc.), rather than where it physically takes place. For example, if all people from one municipality work in the neighbouring municipality, GDP of that municipality is 0, since no production takes place there, but the GNP of the same municipality is high, since people receive wages and profits from the neighbouring municipality where the production takes place.

In order to measure material welfare of a municipality the best we can, we would like to have data on disposable income of all people residing in a municipality, i.e. GDI (Gross Disposable Income).

GDI = GNI + (transfers[8] – taxes),

where GNI is Gross National Income, or total gross income at residents' disposal that came from their own production. We can assume for the purpose of this study that GNI at market prices equals GNP, and the GNI can be replaced by GNP in the above equation (Ouanes & Thakur 1997). Thus, GDI = GNP + (transfers – taxes). On the other hand, transfers refer to income received from third parties, such as pensions or remittances from abroad. When we refer to transfers, it is important to only take into account transfers that are not tied to poverty such as

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[8] E.g. remittances as private transfers, and pensions as government transfers

pensions and remittances. Including poverty-related transfers coming from the government (e.g. MOP[9], child allowances) would make the municipalities receiving them seem better off than they really are, and thus distort their rankings.

Even though GDI would be a good measure of average material welfare in a municipality, it would be too hard to measure, and the purpose of the theoretical discussion above is to explain how we reasoned towards using the indicators we use.

1.1.2. Measuring welfare through the consumption side

In order to be able to measure consumption directly, we would need to have complete data on private and public consumption within a municipality, which we do not. However, we will try to capture consumption the best we can with three proxies, and that way complement measured production (NDMP) with the factors it omits.

Indicator: Municipal Expenditures per capita

First, we complement the NDMP with the government service production (which forms around 9% of Serbia's national GDP), not calculated in the NDMP. To do this, we will use municipal expenditures, obtained from the Treasury. This way, a part of the government sector such as municipal authorities' wages and material consumption of local authorities will be captured, giving a better idea of GDP at municipal level. However, it is important to emphasise that the government spending which comes from the central government, such as health and education will not be encompassed. It is not a reason to worry though, since health and education expenditures will be captured through non-material indicators of (under)development, such as high school enrolment rate. Lower expenditures on education should be inversely correlated with high school enrolment.[10] We are focusing on municipal expenditures, since it is directly observable and less liable to gross errors than if tracking income and transfers of municipalities.

Indicators: i) Low Voltage Electricity Consumption per capita; ii) Completed Housing Units per capita

We would immensely benefit from having data on annual remittances at municipal level, in order to use them to make appropriate adjustments to the NDMP at municipal level. Even though the data exist with the National Bank of Serbia (NBS), they are not accessible to the general public. However, this issue will be raised in the evaluation of potential criteria for measuring development.

Nevertheless, our aim is to capture part of the remittances as well as other omitted sources of income by using the following consumption proxies: i) low voltage electricity consumption per capita and ii) completed housing units per capita.

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[9] Materijalno obezbedjenje porodice
[10] We will expand on this aspect of government service production in the section on health and education of this document.

From earlier research, we concluded that both of electricity and completed housing were reliable proxies for consumption.[11]

Since the NDMP measure omits part of the service sector, i.e. some of the entrepreneurs, we hoped to capture their activities by using electricity consumption as a proxy for small scale service sector. However, due to some outliers (larger electricity consumers registered on low voltage electricity), we decided to use data for households only. Completed housing units (in m^2) per capita will also reflect the disposable income within a municipality,[12] thus helping us bridge the data gap we have on the production side. Finally, by estimating consumption, we hope to capture some of the income produced outside the borders of a municipality, i.e. generated in a neighbouring municipality. However, these spillovers between municipalities will be impossible to measure perfectly.

While NDMP overestimates value added from material production, and when using this indicator, the ranking of municipalities will be only based on material production, electricity consumption reflects and possibly gives extensive weight to the small scale service sector, and these two indicators are thus likely to complement each other.

We obtained the data for low voltage electricity consumption disaggregated by municipalities from EPS, but, unfortunately, we have not received the data for Vojvodina, disaggregated by municipalities, thus we have not accounted for electricity consumption in Vojvodina. This obviously creates a bias in our results, but without seeing the results, it would be impossible to determine how significant this bias is. We thus recommend that urgent action be taken to obtain the data on low voltage electricity consumption for Vojvodina's municipalities, and import these data into the final set.

Completed housing units indicator is computed as a 3 year average to avoid discontinuous changes in the number of completed units between years. We also looked at the number on uncompleted housing units in the same period, but we concluded that it is a stable number, thus we decided to omit it from our analysis.

In conclusion, the material dimension of wellbeing will be measured in the following manner:

$$f(W) = NDMP*0.5 + C^{13}*0.5$$

Lacking information on the relative importance of NDMP vs. C, they were assigned equal weights in the welfare function.

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[11] See CEVES (2005b), Brcerevic et al (2005) and Radosavljevic (2005) for further details

[12] We expect it to reflect remittances as part of disposable income

[13] Consumption (C) is the index made up of all proxies we use to measure consumption.

1.2. Non-material arguments of the welfare function

We are looking at the non-material arguments of welfare, guided by the fact that goods such as health and education also contribute to human well-being, and are an important complement to material wellbeing. Therefore, under non-material dimensions of development, we would like to take into account health, education, environment and leisure. We were able to identify good proxies for health and education. So far this has not been possible for environment and leisure at the level of a municipality.

1.2.1. Health

It is extremely challenging to measure quality of healthcare. Due to data constraints, we have decided to focus on the following two indicators:

Indicators:

i)   *Primary Care Providers per 1000 population*

This indicator measures primary healthcare quality, since general quality of healthcare is one of the most important features of welfare. We decided to focus on primary care providers, i.e. GPs (general practitioners) and non-specialised nurses, in order to avoid overestimation in large urban centres, due to high concentration of clinics and hospitals. This data is provided by the BATUT Institute for Public Health. The respective weights we gave to doctors and nurses were 2/3 and 1/3, since we concluded that overall, for a health centre, it is more important to have doctors than nurses. Nevertheless, it is important to account for nurses because they can do most of the simple things people need. Prenatal care, baby check-ups, vaccines, blood tests, simple diagnoses of colds and various aches and pains and distributing literature. Basically, they can do a lot of preventive work and simple curative interventions. And as the saying goes, an ounce of prevention is worth a pound of cure.

ii)   *Infant Mortality Rate*

Infant mortality rate is the number of dead infants divided by 1000 live births during one year. It is used as an indicator to monitor progress of Millennium Development Goals (MDGs). It is a useful and sensitive indicator of a country's level of health or development, and indicates physical quality of life. At municipality level, it is an indicator of quality of life and healthcare provision and quality. Nevertheless, we adapted the indicator a little bit, since a higher infant mortality rate implies a lower level of development of a municipality. We thus calculated a reciprocal value of infant mortality rate, to make it comparable with other indicators. The formula for this new indicator we use is (1 – Infant Mortality Rate), and this way, a higher value of the indicator implies more development, just like a higher value of other indicators implies a higher level of development. However, we encountered a problem, which is more related to Serbia's demography. Some municipalities have very low birth rates, so

it happens that only 10 children were born in the given year, and if 1 of them died, we get the data that 10% of newborns in a given municipality die (we tried a few years average, we still have the same trouble). The argument here is that when there is a low level of aggregation, the indicator should be entirely omitted. Thus, the question raised is whether infant mortality is adequate only at a more aggregated level of analysis such as national, in a country like Serbia. For the moment we decided to include this indicator, but this issue should be investigated further.

1.2.2. Education

A vast amount of literature deals with the essential role of education in development, and even though there may be debate on welfare returns to education, depending on the various levels of educational attainment, general consensus has been built around Amartya Sen's theory that basic education is a fundamental human right. As primary education is not a very recurrent trend in Serbia, we are more interested in individuals' attainment of vocational or university level training, guided by a hypothesis that more education brings more welfare. We tested this hypothesis very arbitrarily, by looking at the number of unemployed, disaggregated by qualification levels, and seeing that higher numbers of unemployed are characteristic of groups with lower educational attainment.

When evaluating quality of education in a country, or for the purpose of this analysis, in a municipality, one needs to evaluate both the demand and the supply side of it. The demand side of education is reflected through demand for educational services, which in Serbia is mostly related to the number of people interested in attending high schools or university, since there are no problems with access to primary education. There are primary schools everywhere, but when it comes to higher levels of education, the demand is constrained by distance, or more importantly (since not every municipality has high schools) lack of finance needed to, for example, attend high school or university in a larger town or a neighbouring municipality. As the closest proxy we could find, we decided to use educational attainment of the population, as well as high school enrolment rate. These two indicators are explained in greater detail below. The supply side of education is reflected in the quality of teaching faculty, the knowledge children possess as well as the quality of some physical attributes themselves, such as access to clean water, or presence of telephone. We would like to have data on training of school principals in administration as a proxy for school quality. Singapore, for example, carefully selects those teachers that have a bent for administration (based on merit not seniority) and puts them through 6 months of compulsory training, including a stint in industry if they are to administer a Training/Vocational school. Results there speak for themselves.

It would also be great to be able to measure quality of education by testing, preferably through external assessments, the students' skills in such areas as numeracy, literacy, comprehension and problem solving. However, the only data on school quality we have is our constructed school quality index described below.

Indicators:

i) High School Enrolment Rate

Number of pupils enrolled into the first year of high school, having completed primary education in the same year. We obtained the data from the Ministry of Education, and we account for each student at the municipality of primary school completion, thus avoiding the bias where municipalities without high schools do not have any enrolment rates. Basically, each we do not care where they enrolled into high school, we only look at the fact that they did, after completing primary school.

ii) Educational Attainment

Ratio between the number of inhabitants between 15-65 years of age with educational attainment of high school or higher, compared to the total number of inhabitants between the age of 15-65.

iii) School Quality Index

Constructed index measuring school quality. The index assigns equal weights to each of the following indicators: number of books in school library per student + schools connected to Internet + schools with telephone. The indicators have been taken from a UNICEF study on school quality in Serbia, and their database will be used to calculate the index.

1.2.3. Environment

We are particularly insistent on stressing the importance of environmental indicators of municipal underdevelopment, since environment is left out of many discussions on poverty and underdevelopment in Serbia. Concerning the fact that Serbia's PRSP is not giving adequate attention to environmental determinants of poverty, our recommendation is that a stronger tie be established between environmental factors and this national strategy.

However, the main challenge in identifying environmental indicators lies in the fact that most environmental data is not available at municipal level. This data gap could be bridged by introducing environmental maps, with the possibility to overlap them with the maps of municipality development under different criteria. That way, attention will be drawn to areas, or coalitions of municipalities exposed to adverse environmental conditions.

We believe that environmental factors and general health of the population will be a more important indicator of development for Serbia in ten years time than income poverty. It is therefore recommended to collect data on CO_2 emissions at municipal level, as well as identify the big polluters. Forest cover, water quality as well as

sanitary connections are also important indicators of environmental conditions, and therefore direct contributors to the quality of life. Besides, there are financially viable, self-financing mechanisms to reduce pollution at all levels including municipalities, such as the Global Carbon Fund Facility. The World Bank is involved in this programme (ww.carbonfinance.org). The idea is to increase funds of the municipalities through carbon credits at the world carbon trading market.

The financial impacts of pollution, especially once Serbia enters the EU accession process will be immense. Jantzen & Pesic (2004) estimate financial damage to Serbia from environmental pollution by 2013, by building nine possible scenarios, where only three (the ones highlighted in green) will be losses caused even if improvements in pollution levels occur (Jantzen & Pesic 2004 in Pesic 2006, p.8). One of their estimates of GDP for 2003, which we accept as the best proxy to the actual GDP in 2003 (there were no official figures for GDP in 2003) was at around 17bn euros[14].

Table 1 shows these nine scenarios of financial losses to the GDP caused by pollution:

Table 1: Forecasts of environmenal damage in Serbia in 2013

Economic growth		Scenarios of environmental protection policies		
		technological progress		EU policy
		0%	-2%	-5%
Low	1.80%	€ 1,027,960,000	€ 842,800,000	€ 621,230,000
Medium	4.73%	€ 1,365,250,000	€ 1,125,830,000	€ 837,060,000
High	8%	€ 1,856,670,000	€ 1,540,130,000	€ 1,155,770,000

Source: Jantzen & Pesic 2004 in Pesic 2006, p.8

In light of these figures, we can say that environmental protection is an imperative for Serbia's future growth and development.

We got some ideas for indicators from "The Environmental Protection Indicators for California" (EPIC) project, which is a collaborative effort of the California Environmental Protection Agency (Cal/EPA), the Resources Agency, the Department of Health Services, and an external advisory group consisting of representatives from business, public interest groups, academia, and local government. The project is responsible for developing and maintaining a set of "environmental indicators" for California. Some of the indicators used in this project that we found interesting in the Serbian context are the following:

i) Days with unhealthy levels of ozone
ii) Days with unhealthy levels of carbon monoxide

Another indicator suggested by Pesic (2006, pers. comm.) is:

iii) Days per month when drinking water supplies exceeding maximum contaminant
    levels, which is obtainable for municipalities from local water suppliers.

We therefore recommend their future collection across Serbia, at municipal level, or at least county level.

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[14] CEVES methodology estimates this figure to be at around 18bn euros.

1.2.4. Leisure

Aristotle is the first, and so far the only philosopher, to have held the view that leisure is a fundamental human value. The common definition of leisure as "time off work" or "time for play" points out an important aspect of leisure: *time*. It specifies the nature of the freedom or opportunity which is involved in leisure: leisure is *time* available for action. Leisure is a measure of an individual's values in the same sense that money is a measure of market value. Just as we must economize money, so we must economize leisure. As means, both are measures of our expenses. As ends, both are measures of our income. When we use the same value to measure both income and expenses, we can calculate profit or loss by simple subtraction. We are bringing leisure into our discussion, because we want to emphasise that material wellbeing is not the only aspect of welfare. We would like to mention the always occurring question whether a person living in the countryside using nature as a source of food and health, with a lot of leisure time at hand is poorer than someone living in the city, having a reduced life expectancy from stress and air pollution, and never having time for leisure, but can afford to eat in a restaurant. Even though we will not measure this aspect of welfare at the moment, and it may seem irrelevant in the current Serbian context, it should be kept in mind. As a suggestion, one of the indicators for leisure is average hours worked per worker per year, but this data is not available at the municipal level.

2. Prospective welfare of municipalities

In order to estimate prospective welfare of a municipality, or its potential to develop, we adopted the 'Asset Pentagon' analysis used by United Kingdom's DFID (Department for International Development) as a component for measuring sustainable livelihoods. Within this analysis, we are to measure the types of capital at each municipality's disposal, and based on the amounts of various capital, we hope to estimate their potential for future development.

2.1. Municipality performance forecast

iii) *Material Welfare Index Growth Rate* for a municipality in relation to the national material index growth rate, can be an important indicator on how a municipality is faring in relation to the national average. Under this indicator we combine all four indicators used in the material arguments of the welfare function (NDMP, municipal expenditures, low voltage electricity consumption, completed housing units), and we look at their growth rates in the last 3 years, in comparison to the national growth rates of the same indicators. This way, by combining them and assigning them the same weights as in the material arguments of welfare section (0.5 to production and 0.5 to consumption), we extrapolate a future trend of the material welfare function. Even though a 3 years time-series is insufficient to make performance forecasts, we will leave this indicator with a recommendation that a larger time-series be acquired in order to get a better indication of their future trends.

2.2. Types of capital at municipality's disposal

From the five types of capital, we will focus on financial, human and physical, since social and natural capital are very hard to measure, and we do not have the necessary indicators.

2.2.1. <u>Financial capital</u> consists of financial resources available to people (such as savings, access to credit, insurance).

Indicator: Access to Financial Services per capita

Number of bank branches per municipality. The data was obtained from the National Bank of Serbia. The logic behind this indicator is the following: if there are banks present in a municipality, it means that the bank is interested to be in that market, or is expecting the market to pick up (e.g. just prior to the privatisation of Knjaz Miloš, banks started flourishing in Arandjelovac). In addition, the more bank branches in a municipality, the more access to credit people and businesses have. To summarise, we believe number of bank branches is a good indicator of either present or expected economic activity. This indicator is used under the assumption that the banks do not get subsidies from the state to enter the poorer markets.

2.2.2. <u>Human capital</u> consists of education, skills, ability to work (i.e. demographic structure), and health which people use to pursue better livelihoods.

Indicator: Population Aging Index

The ratio of the old (aged 65+) to the young (0-14) population. Shows capacity for future development. If there are more young than old people, there is more potential for the municipality to grow and develop. We chose to use this ratio instead of the difference between mortality and births, as people can die for reasons other than old age (especially common in Serbia, due to negative environmental and social conditions, e.g. incidence of cancer amongst younger populations).

2.2.3. <u>Physical capital</u> – the basic infrastructure (water, sanitation, energy, transport, communications), housing and the means and equipment of production.

Indicators:

i)   *Telephone Connections per 100 households*

Shows basic infrastructural capacities and interconnectedness within a municipality. We placed it under physical capital since the number of connections indicates ability to access information, including the Internet. Since we are not able to measure access to the Internet at municipal level, telephone connections are a good proxy for future

ability to access it. Mobile phone usage is not as relevant when looking at telephone connections in terms of capital for future development, since in Serbia, one can still not use the Internet via mobile phones.

ii)   Road Index

The Road Index has been constructed from two indicators with equal weights: Road Quality and Road Coverage.

Measuring quality of roads, by observing the ratio between modern road coverage (asphalt, cement and cobble stone roads) and total road coverage (modern + earth + macadam). This indicator is to measure connectedness and accessibility of municipalities and communities within municipalities. We attempted to evaluate the effect of the railroad on this indicator, in order to avoid underestimation of development (or connectedness), based on the fact that roads in a municipality are not as developed due to reliance on the railroad. However, besides the fact that the main road networks overlap with the railroad network, when we looked at statistics, it turned out that municipalities with the worst road coverage are also the ones without access to railroad. This way, by omitting the railroad, we are overestimating their development (or connectedness). Either way, this is a problem and we need a better clue on how to measure effect of railroad on connectedness. The issue at stake is that some municipalities have access to railroad which they benefit from, some have it but it is not being used, some have access to railroad from the neighbouring community, and some do not have access to it at all. Another concern is the varying degrees to which the railroad is being used, and the purpose of its use, in terms of freight transport, or passenger service.

Road coverage is measured by dividing the total length of modern roads with the area of the municipality. We introduced this measure because we wanted to account for area of municipality as determinant of road density.

However, we encountered a problem with the behaviour of this indicator. It overestimates the development of small municipalities with a medium level of development, such as Lapovo. Ways to address this problem should be explored further.

2.2.4.   Social capital – the social resources (relationships of trust, membership of groups, networks, access to wider institutions) upon which people draw in pursuit of livelihoods.

We do not have any indicators to measure social capital, but social capital is often measured by membership of the people in clubs/churches/choral societies and other group activities because they help enhance the social network.

2.2.5.   Natural capital - the natural resource stocks from which resources useful for livelihoods are derived, e.g., land, water, bio-diversity, environmental resources.

We do not have any indicators to measure natural capital, but they can be measured by access to lake, mountain, or natural reserves, or anything else interesting for ecological tourism.

Conclusion

Policy Implications

We would like to point out that great care has been taken to be as objective as possible when measuring conditions within municipalities in Serbia. However, there are many potential applications of this document, depending on the development strategy the government wants to apply for certain areas. Numerous issues can be raised with regards to policy implications of this study, but they all depend on government priorities. For example, what might be the government's policy towards a municipality that lives off of remittances and does not have an industry of its own? Should the government find ways of helping the municipality develop its industry? What should be done with a municipality which has a high number of the old? Depending on the government strategy and the cost of implementing it, implications for development will vary. These are some ideas which need to be researched further, in order to understand local development prospects in Serbia. Some further lines of research should include interactions between municipalities, as it is hard to isolate them as independent units of analysis.

Directions for Further Research

It is important to keep in mind that (under)development is a complex issue, and that further research is needed in order to improve everyone's understanding on the strengths and weaknesses, as well as the opportunities and threats facing municipalities across Serbia on their path to development. The following ideas should be explored in further research:

1. A multivariate factor analysis of the chosen indicators in our analysis should be conducted in order to strengthen the statistical base for our arguments. This analysis will possibly enable shrinking of the final set of indicators, and it may help determine more objective weights to be given to each indicator (or cluster of indicators).

2. The importance of the non-material indicators used in this study can be explored further. Some alternative indicators for quality of healthcare and education, as well as environment, could be found. Most studies we have encountered in Serbia have been observing underdevelopment through material indicators. However, we would like to stress the importance of non-material indicators (in the Human Development Index, they are given a weight of 2/3 in comparison to the weight of 1/3 for the GDP), and point out a need to improve data collection and access procedures when it comes to these indicators. Graph 1 illustrates the differences in rankings of municipalities when only material indicators are used versus the non-material indicators. We can tell that some municipalities which seem very developed according to material indicators, are very underdeveloped according to the non-material indicators and vice versa. Therefore, a better understanding of these differences is crucial.

Graph 1: Ranking of Municipalities according to Material Index vs. Non-material Index.
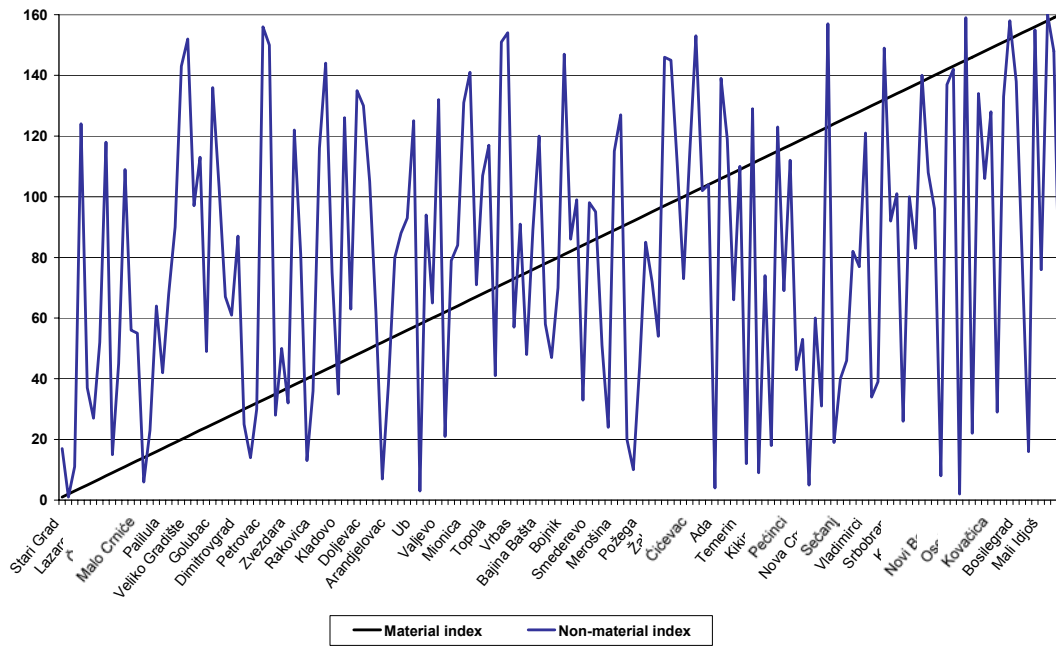
3. Inequality within municipalities is difficult to capture, and potentially some measures of inequality could be explored as well as analysed at the municipal level.

References

Environmental Protection Indicators for California, California Environmental Protection Agency – California Resources Agency, EPIC 2004 Update, http://www.oehha.ca.gov/multimedia/epic/pdf/EPICupdate2004a.pdf, accessed on November 8th, 2006

Jantzen, J & Pesic, R 2004, *Assessment of the Economic Value of Environmental Degradation in Serbia*, EAR & DHV

Pesic, R 2006, *Ekonomska aktivnost i stanje životne sredine u Srbiji*, unpublished manuscript, written for Sustainable Development Strategy of Government of Serbia

Pesic, R 2006, Professor of Economics, University of Agriculture, Belgrade, personal communication, November 10th, 2006

Annex 1: Rurality

This annex summarises the issues encountered throughout our research, regarding the definition of rurality in Serbia. It discusses some of the internationally commonly used definitions of rurality, and the significance of the rural-urban gap in Serbia.

We have encountered many dilemmas when trying to distinguish between urban and rural areas. The RSO does not have a clear definition of rural areas. Bogdanov (2006), a professor at the Faculty of Agriculture, in an unpublished manuscript explains that every census since 1981 classifies a settlement as urban if its municipal authorities decide it to be. It is enough for a settlement to have a generic urban plan in order for it to be declared urban. All settlements not declared urban are classified as 'others' and are automatically assumed to be rural. In addition, she argues that defining rural areas is methodologically very complex. When some of the current results on rurality are interpreted, it turns out that a high number of municipalities (Bogatić, Vladimirci, Golubac, Žabari, Gadžin Han, Doljevac, Preševo etc.) of which some cover a large area, do not have an urban part to them, but are considered entirely rural, whereas some of the others of similar size or significantly smaller are considered mostly urban. She also points out that Serbia is expected to adopt one of the internationally accepted definitions of rurality by the end of this year. Her advice is to keep calling non-urban areas 'others' until a new definition is adopted. Once Serbia adopts the new definition, the data we currently have on rural areas will not be comparable to future statistics on the newly defined rural areas. She also emphasises that when analysing surveys that take the currently defined rural areas into account, one should treat the results with great caution.

A UK based Institute of Rural Health (2005) argues that, since there are no common definitions of rurality in the EU, it is possible to use the following measures when measuring rurality:

- measures of settlement size
- population density/sparsity
- accessibility to services
- peripherality
- land use

We can see from the above criteria which determine rurality that rural populations are not agricultural by default, and that not only agricultural populations are defined as rural. Rural areas can encompass villages as well as small towns, and sources of income in rural households can be diverse. Even the Serbian Ministry of Agriculture divides rural households into agricultural, non-agricultural (living in a rural area, working in the town) and mixed.

Because of this lack of clear definitions, Moslavac (2006, pers. comm.) from the UNDP informed us that around 2mn people, mostly from non-agricultural rural households are left out of all government strategies for improvement of wellbeing, according to some UNDP yet unpublished surveys. The Ministry of Agriculture focuses on the agricultural population, whereas the Ministry of Work, Employment and Social Policy focuses on the urban unemployed, guided by the standpoint that rural population is under the domain of the Ministry of Agriculture. Moslavac (2006,

pers. comm.) therefore recommends that the Ministry of Agriculture be renamed into Ministry for Rural Development, like it is called in the rest of Europe. Its mandate would then cover rural infrastructure, diversification of sources of income, support to young farmers, as well as environmental protection.

Moslavac (2006, pers. comm.) also refers to another unpublished study on the employment structure of the rural population in Serbia, which shows that rural tourism forms only 2% of the total employment share. Construction work on the other hand is a significant source of employment for the rural population, showing that agriculture is not the sole source of employment in rural areas, and that rural households rely on some conventionally "non-rural" jobs as sources of income. In the light of these data, I would rather say that intra-municipal inequality would be a bigger problem we may run into where there are both rural and urban areas within one municipality which do not interact much. We will not be able to capture inequality because of analysing municipal averages.

It is wrong to assume that rural areas are poorer by default, and we are actually more interested in measuring remoteness, in terms of lack of access to a market, or education and health, than rurality per se, in order to determine underdevelopment. A rural area with good access to services and roads can be reasonably developed. Therefore, we believe our indicators are not particularly biased towards urban or rural areas. We will capture remoteness through telephone connections and road coverage indicators, Our Net Domestic Material Product (NDMP) indicator accounts for agriculture, and accessibility to services will be measured through health and education outcomes.

We also believe a rural-urban gap in Serbia is not very significant at the municipal level, since there are high levels of interaction between rural and urban communities within municipalities, and that development of rural areas depends on the development of urban areas and vice versa. For example, rural areas depend on selling their products in the urban market, where, with the increase of the purchasing power of the population, their income from agricultural products can grow. Also, with the increase in living standards of the urban population, rural tourism will grow, providing additional sources of income to rural households. Reciprocally, clean air and nature in rural areas will contribute to life quality of the urban populations, and consequentially with the increase of interaction between the two, roads as well as other dimensions of connectedness between the rural and urban areas will improve, bringing even more benefits to each community.

In conclusion, the 'urban-rural gap' analysis is appropriate at the national level, but it may not seem as relevant at the municipal level.

References:

Bogdanov, Natalija 2006, '*Metodološka ograničenja definicije ruralnih područja'*, unpublished manuscript, Faculty of Agriculture, University of Belgrade

Institute of Rural Health 2005*, 'Rural Proofing for Health: A Toolkit for Primary Care Organisations',* viewed: 18 October 2006, http://www.ruralhealthgoodpractice.org.uk/index.php?page_name=section1_chapter2_rurality

Moslavac, Nenad, Programme Manager in UNDP, personal communication, October 18, 2006

Annex 2: Quality of Census Data

This annex summarises the issues encountered throughout our research, regarding the true population of Serbia, and the quality of the 2002 Census. It discusses some of the common doubts about the reliability of Census data at municipal level, and it explains how we accounted for the internally displaced persons from Kosovo (IDPs).

Through numerous evaluations of the Serbian statistics, we began asking ourselves about the reliability of the 2002 Census. Can Serbia be quoted on its residents without great caution? Within the context of this project, implications can be substantial. What is Serbia's accurate demographic situation? Can we use 'per capita' in our indicators to portray actual circumstances across municipalities? In all our indicators we use 'per capita' since the values are looked at in relation to the number of people within a municipality. However, it is important to understand the potential problems that inadequate demographic data can cause in this study.

The whole system of registration and un-registration of an individual in a municipality in Serbia is complex. Only in Belgrade one automatically gets un-registered from one municipality once they register at another location. In other parts of Serbia, a person has to un-register in one municipality in order to be able to register somewhere else. This is a source of nuisance for many people, since it involves a lot of bureaucracy, and there is plenty of anecdotal evidence of people residing and working for many years in one location, while they are officially registered at another location. This is particularly common in Belgrade, and other University centres, where students from smaller places come to study and stay after graduation to work, without ever having registered as official residents of Belgrade. Immanently, they are part of the electricity consumption patterns in Belgrade rather than in their official place of residence. Thus, in our 'electricity consumption per capita' indicator, we have an overestimate of per capita electricity consumption in Belgrade, because we use the Census data and divide the amount of electricity consumed by the registered residents (the official number being significantly smaller than unofficial estimates of Belgrade's residents). Equally, we have an underestimate of electricity consumption per capita in a non-Belgrade municipality, since we divide it by the official number of residents, of which a number does not participate in this consumption, but in fact lives in Belgrade.

Penev (2006, pers. comm.) believes that the 2002 Census, even though it has its problems, offers quite a realistic overview of Serbia's situation, given the circumstances, and the bureaucracy involved in registration of individuals. According to him, the largest underestimates in the number of inhabitants certain municipalities have, has to do with IDPs (internally displaced persons). Unlike refugees from former Yugoslav republics, IDPs from Kosovo have not been listed as permanent residents in Serbia (even though the surveyors registered them as IDPs[15]), since their official place of residence is still Kosovo, even though they have not returned up to this date. Had there been a Census in Kosovo in 2002, the IDPs currently living in Serbia would be registered as permanent residents there. Vice versa, people (Albanians) who moved from southern Serbia to Kosovo after the 1999 war are still listed as permanent residents in Preševo or Medvedja, even though they are in fact IDPs in Kosovo. Penev

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[15] These data have not been published by the RSO due to political implications

(2006, pers. comm.) therefore suggests that in those municipalities where numbers of IDPs from UNHCR statistics are significant, one should add them to the permanent population of the municipality, to offer a realistic overview of the demographic situation in that municipality. Since municipalities with collective centres for IDPs consume a lot of electricity, by omitting them, we would have distortions in low voltage electricity consumed per inhabitant in our indicators. For example, Kuršumlija has 21,000 inhabitants, but it is also home to around 6,000 IDPs, thus the real number of Kuršumlija inhabitants should in fact be 27,000. If we omit those 6,000 IDPs, we have an underestimate of Kuršumlija's population by around 30%.

References:

Brcerevic et al 2005, 'Spotlight on: Investment in Serbia', *Quarterly Monitor*, Issue 3, FREN, pp. 71-77

CEVES 2005b, 'Serbia's Economy: The Stylized Facts 2000-2005', Volume II, http://www.fren.org.yu/sr/index-sr.htm

Jantzen, J & Pesic, R 2004, *Assessment of the Economic Value of Environmental Degradation in Serbia*, EAR & DHV

Ouanes, A, and Thakur, S 1997, 'Macroeconomic Accounting and Analysis in Transition Economies', IMF

Penev, Goran, Institute for Demographic Research, Belgrade, personal communication, October 27th, 2006

Pesic, Radmilo 2006, *Ekonomska aktivnost i stanje životne sredine u Srbiji*, unpublished manuscript, written for Sustainable Development Strategy of Government of Serbia

Radosavljevic, Goran 2005, 'Spotlight on: Consumption of Electric Power as an Indicator of Economic Growth', *Quarterly Monitor*, Issue 2, pp. 50-57

Annex 3: Evaluation of frequently discussed indicators

This annex evaluates the commonly discussed indicators when measuring municipal development in Serbia. It explains why we decided not to use some of the frequently used indicators, and why we decided to use others. It also suggests improvements in reliability of and access to municipal level data.

1. GDP per capita/ GNP per capita

GDP per capita is commonly used as an indicator of material welfare in a country, but just like economic growth is not a good indicator of welfare, GDP per capita can be an inadequate measure to use. GDP only counts goods and services that pass through markets, and production that is not bought or sold does not generally get counted. Also, many "bads" are included in GDP - higher crime rates lead to more expenditures on police, international tensions lead to more expenditures on arms, more disease leads to more medical spending, etc. - and thus GDP overstates welfare. GDP per capita also does not account for inequality between individuals and households, as well as in terms of regional inequalities. Instead, it expresses an average level of welfare, that way overestimating the welfare of the poor and underestimating the welfare of the rich individuals or regions. Moreover, GDP per capita does not account for better delivery of education and health, as well as environmental protection (since negative externalities of production, such as pollution are not taken into account).

GDP per capita may be even a more inappropriate measure of welfare at municipal level because differences between GNP and GDP have very different implications at the national in comparison to the municipal level. GDP refers to total goods and services produced within a nation's geographical boundaries, regardless of the nationality of the producer, whereas GNP refers to total goods and services produced by residents of the country, regardless of their location of production. While the difference between GNP and GDP at the national level is usually not very significant, it becomes a lot more relevant when we compare the two at the municipal level. It will not happen that all people from one country work in the neighbouring country, but there may be quite a few cases where people from one municipality will work in the neighbouring municipality. Because of a higher level of interaction between residents of neighbouring municipalities, it is a lot more complicated to compare economic indicators of development across municipalities, than having a cross-country comparison. Along those lines, if we had the required data, we would be interested in estimating GNP instead of GDP since we would rather know who owns the production, i.e. who gets the benefits from that production (in terms of wages, profit etc.), rather than where it physically takes place. For example, if all people from one municipality work in the neighbouring municipality, GDP of that municipality is 0, since no production takes place there, but the GNP of the same municipality is high, since people receive wages from the neighbouring municipality where the production takes place.

In Serbia, there are challenges when calculating the national GDP, since entrepreneurs are not accounted for in the methodology, and as a consequence GDP is underestimated. Nevertheless, GDP at municipal level is not available in Serbia, and we are not sure whether it is common practice in other countries, thus it is futile to evaluate it as a measure of municipal welfare.

2. Net Domestic Material Product (NDMP) per capita

NDMP is the closest measure we have to municipal GDP[16]. This is the 'National Income[17]' measure used by the Republic's Statistics Office (RSO), but in our opinion it is a misnomer, and it will cause too much confusion if we refer to it as National Income. In the market economy, national has different implications from domestic, and these differences are not negligible, especially at the municipality level, as already described above (the difference between GDP and GNP). The NDMP is based on the concept of material production accounting, which is a narrower concept than production as measured in GDP. NDMP for enterprises is based on the data from their financial reports and other book-keeping records, and for agricultural households and private shops, it is based on special surveys conducted at annual level. NDMP encompasses the following activities: agriculture, hunting and forestry, fishing, mining and quarrying, manufacturing, electricity, gas and water supply, construction, wholesale and retail trade, repair, hotels and restaurants, transport, storage and communications, real estate activities, renting, health and social work (only veterinary services and professional rehabilitation of invalids) and other community, social and personal service activities. It is currently the best proxy for GDP we have in Serbia at municipality level, but there are many problems with the use of this indicator. For example, it omits some of the service sector (small entrepreneurs, e.g. hairdressers, as well as the entire financial sector, e.g. banks, consulting etc.), as well as the entire government sector. However, it is important to note that it accounts for agriculture, thus avoiding underestimates in rural areas.

3. Income/Consumption

a) Income

In the Household Budget Survey (HBS)[18], disposable income of households consists of: wage income, other earned income, pensions, social security, income from agriculture, fishing and hunting, remittances, income from property, gifts and gains, spending and investment loans, as well as income from natural production and consumption. Income is a problematic measure of the living standard since households have the initiative to underreport income from illegal activities, i.e. the grey economy, as well as underreport income in general in order to be eligible for social benefits.

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[16] A Marxist proxy
[17] Narodni dohodak (ND)
[18] HBS accounts for disposable income and consumption, while LSMS only accounts form consumption.

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The consumer basket in Serbia is constructed by taking into account price differences in different locations. Even if the basic goods basket is well measured and reflects purchasing power differences between municipalities in Serbia, we can still argue that a smaller place can offer a better standard of living than a city, since transport costs are a lot lower. It is also important to stress that households are not necessarily the ideal units for measuring income poverty. This is due to the fact that when looking at a household as the basic unit of analysis, we assume intra-household equality, i.e. we assume that within one household everyone gets a fair share of income, and that the basic needs of each household member are satisfied. It is often the case that women and children (especially girls) are allocated an inequitable portion of income in comparison to the males in the household.

b) Consumption

Consumption could be an adequate substitute for income when it comes to measuring standard of living. It shows everything a household purchases in one month, and that way it can more objectively show how much money that household has at its disposal. However, consumption is a tricky indicator for the following reasons: income is a lot more stable indicator, since consumption varies with seasons (e.g. heating, electricity, water etc.), and it is easier to measure as well as compare income across households, especially in the longer run. If a household relies on natural production, and grows its own fruit and vegetables, which value should be given to those products in order to calculate consumption in monetary terms? Consumption also varies with personal taste, and it can therefore be difficult to compare it between households and individuals. Also, it is questionable whether consumption should include free healthcare, public education etc. since those are the items a household would have to spend money on if they were not free of charge (we should check how the RSO accounts for goods provided by the government, such as education and health, since they have to be shown somewhere as part of living standard of a household). It is also questionable whether one should measure individual or household consumption, and in case it is measured per individual, what happens to the goods that are shared at household level (food, TV, washing powder etc.). Households can opt for savings at the expense of consumption as a safety net for future, especially if they lack access to credit or insurance. When measuring consumption, care should be taken not to include consumption on inputs for domestic production, such as tools and fertiliser, since that would give an unrealistic picture on the standard of living.

According to CEVES (2005a), the expenditure figure recorded by the LSMS is likely to, if anything, be an under- not an overstatement. First, all else being equal, a survey measuring household expenditures/consumption will miss to record some expenditures, not be likely to overstate them. Overstatements may be the result of methodological problems. For example, the observation could have been conducted at the wrong time of the year, when expenditures are seasonally higher than average. In the case of our LSMS the timing was May-June, when expenditures could only have been lower than typical: there were no pre-holiday season expenditures, no winter heating expenditures, and no beginning of school or vacation expenditures. Other methodological problems, concerning individual

items, could have happened, but again, they were more likely to suffer from omissions than overstatements. One likely insufficiency both in the LSMS and HBS is the inadequate measurement of consumption from own production. This is extremely broadly present in Serbia, even in highly urbanised educated households and its adequate accounting would likely substantially increase the household consumption/expenditures figures. This omission is present on the production side as well (CEVES 2005a, p.32).

CEVES (2005b) brings in the case of transport services (urban transport, trains, bus etc), where it is clear that there are far better information on the amount spent by households coming from the organisations operating these kinds of transport than from the households themselves. On the one hand, it is normal to correct the data with companies' data. On the other hand it is rather frightening to see that in a case where we have a "sure" information coming from another source, this information shows that we should add 75% to the amount recorded through the survey. The same argument goes for item 8.1 where communication appears to be also 75% larger than recorded by the survey, when one asks the telephone companies. As it is rather easy for an interviewed household to look at their telephone bill and there is no real secret as to how much is spent on that purpose, we may devise that the panel of interviewed households (through the HBS) might not be using new communication devices such as cellular phones etc. A confirmation of that tenet is item 7.2 "operation of personal vehicles". This item corresponds mainly to purchases of gasoline, which is also a product of which the distribution is largely controlled by the government (and thus the actual consumption is rather easy to know); here, the addition of 40% to the amount recorded from the survey shows that either interviewed households have less cars than the rest of the population, or that they use their car less than others. Looking at the availability of durables (pages 199 and 209 of Bulletin 437) shows that, out of 100 HHs (interviewed in the Anketa), 47 have a car and 70 have a cellular phone. CEVES (2005) concludes that this information should be cross-checked with police information about the total number of registered cars and information from telephone companies about the number of subscriptions (CEVES 2005b, p.245-6).

In general, living standard can be estimated from data on both income and production, which can be compared afterwards, in order to determine discrepancies and better understand the dynamics between income and consumption of a household. However, in terms of data availability at municipality level, we are faced with lack of data on both income and consumption. The HBS (Household Budget Survey) with the sample of 4800 households, which is being conducted in Serbia since March 2003, and the LSMS (Living Standards Measurement Survey) with the sample of 8027 households, which was conducted in 2002 and 2003 and is also provisioned for 2007, cover small samples of households, making it difficult to disaggregate data to municipality level. However, the World Bank developed a methodology, described in "Geographical Targeting of Poverty Alleviation", edited by David Bigman and Hippolyte Fofack, World Bank, October 2000. The book explains how, with the help of poverty mapping software (Geographic Information System – GIS), data from the household survey can be combined with the census, to give estimates of household consumption at municipality levels. However, this method

has still not been implemented in the Serbian statistics, even though we can expect informal results from this methodology by the end of 2006. In addition, it is provisioned that the HBS sample be increased to 6000-7000 households, as well as the whole survey be upgraded with additional questions, referring to education and health, in order for the survey to be representative of wider social indicators of living conditions. The HBS will be complemented by these additional modules until European Union's SILC (Survey on Income and Living Conditions) is implemented in the Serbian Statistics. The increased sample as well as additional questions will improve the representativeness of the data at municipal level.

4. Average wage

Average wage is not a good indicator of living standards since households in Serbia rely on non-wage sources of income as well as natural production in order to make ends meet. CEVES (2005a) reveals how the SNA figure on household expenditures in 2003 suggests that the average household in Serbia spent about 28,180 dinars or 434 euros per month—a little over twice the net wage that the less than one formally employed household member brought home[19]. Such an expenditure figure suggests a very large share of non-wage income in household accounts, but is the LSMS and all other information suggests the true figure is even higher (CEVES 2005a, p.32).

Stanic (2006) offers an excellent overview of why wages are statistically inadequately measured. She argues that the growth of wages in the period 2000-2005 can be almost entirely ascribed to growing formalisation and fiscal adjustment of the economy. Additionally, statistics on wages are dominated by a subset of enterprises from the socially-owned and public sectors, whereas wages paid by small businesses are not monitored at all (Stanic 2006, p.61). Her article should serve as an excellent starting point for expanding one's knowledge base on wages in Serbia.

Stanic (2006) reveals that fiscal data on wage tax offer a better overview of wages than the RSO data, since taxes paid on wages are a better indicator of actual salaries paid out than the data collected by the RSO. If for no other reason, tax authorities cover a whole universe, whereas the data from the RSO are based on samples of questionable reliability (Stanic 2006, p.68-9). However, entrepreneurs and small enterprises still report lower salaries than they offer to their employees, in order to avoid paying soaring medical and pension benefits for their employees the total of which amounts to around 70% including income tax. By some unofficial estimates, small companies report salaries 20% lower than they actually are, so the fiscal data on wage tax also omits the extra money paid to employees above their official wage.

5. (Un)employment rate

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[19] They refer to the average wage paid out, as opposed to the published official figure which underestimates it.

Arandarenko (2006, pers. comm.) suggests that looking at employment instead of unemployment is better for the following reason: unemployment rate does not account for the inactive[20] part of the population, quite a common phenomenon in the more underdeveloped municipalities across Serbia. Using employment rate instead, we consider both the unemployed and the inactive as economically unproductive parts of the population.

After a detailed assessment, Stanic (2006) concludes that RSO analysis of <u>formal</u> employment based on the *Monthly Report on the Employed and Wages (RAD-1), Semi-annual Report on the Employed and Wages (RAD-1/P)* and the *Additional Survey to the Semi-Annual RAD-1 Report* can be said to have a great deal of accuracy (Stanic 2006, p.64). RSO annual publication *Opštine u Srbiji* uses the data from these surveys and disaggregates them by place of residents of employees in order to offer rates of employment at municipal level.

Interestingly enough, in light of privatisation and company restructuring, employment records have not changed much. Most companies that started restructuring had high fictional employment prior to it, and lots of employees either had a private business on the side as an alternative source of income or with the severance payment started a new business, or registered an existing business, and thus did not stay unemployed. Statistical data does not show large changes in the numbers of unemployed (even though the numbers of workers made redundant were high), thus we believe company restructuring did not affect the (un)employment rate significantly (Stanic 2006, p.64). We will see how future restructuring will affect the unemployment rate though.

However, amongst some parts of the population, there is a trend of not registering to the unemployment bureau or even being registered at work, because they work based on contracts and do not pay health and pension benefits. Thus, the employment rate can be significantly underestimated. According to the definition, every person that works, even a part-time or a seasonal worker is treated as employed. The statistical survey *RAD* that the publication *Opstine u Srbiji* is based on does not account for the entire agricultural workforce, thus when the total number of employed in Serbia from *RAD* is compared with the total number of employed from the *Labour Force Survey (LFS)[21]* which accounts for the agricultural workforce, there is a huge discrepancy in the number of the employed between the two surveys. Moreover, people that are officially unemployed can be vulnerable to poverty or poor, due to low wage or not receiving their wage at all in the socially-owned sector.

The unemployment rate can depend on inequality, in terms of the wage differential between industries on offer. In a region with higher inequality, the wage differential between two sectors can be expected to be high. Therefore, the unemployed person will have more incentive to wait for a better paid job for longer, and will stay unemployed for longer. Galbraith & Garcilazo (2004) argue that this is the case in Spain (Galbraith & Garcilazo, 2004, p.3). Also, they stress that amongst the young, especially when it comes to first employment, there is

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[20] E.g. housewives
[21] Anketa o radnoj snazi (ARS) conducted by the RSO

incentive to wait for a better job for longer, since once they get a worse profiled job, it may be more difficult to make the transition to a better paid job (Galbraith & Garcilazo, 2004, p.5). However, this may not be relevant in the Serbian context, where people are desperate to take any available job since unemployment is a huge structural problem, and where the young are not very career oriented, since their motivations are not encouraged through education.

In order for the statistics on (un)employment to be more valuable, they should be disaggregated by age groups, as well as types of employment. Many countries have problems with youth unemployment which is a very specific type of problem, and the policy implications of solving this problem are different from solving total unemployment (it is about developing human capital through combating idleness of the young, rather than solving income poverty). Equally, for the types of employment, seasonal and part-time employment needs to be distinguished from full-time employment in the statistics. Looking at the employment rate of women in relation to men, one can detect patterns of gender discrimination. However, one should be careful when making conclusions about gender disaggregated statistics on employment. Women may seem to be discriminated in the figures, but they are also less flexible in terms of migration and going to work away from family. Men have the advantage of being able to work away from home, and in an economy like Serbia's, where economic growth is pretty high, many jobs are accumulated in construction, which demand male labour force, and the expansion of these sectors is limited to the main urban locations, such as Belgrade and Novi Sad.

When we analyse unemployment, it is important to consider the long term unemployment rate ($\geq$12 months) and the very long term unemployment rate ($\geq$24 months), as well as the number of people living in jobless households (where nobody is employed), because statistics disaggregated like this tell us more about long term poverty rates than the total unemployment rate. Such indicators are commonly gathered by the Eurostat in the European Union. Most certainly, the RSO collects most of the above information, but they do not publish it, so it should not be very costly to ensure access to them.

In order to further illustrate why we did not use the employment rate in the final set of indicators, Graph 2 compares the ranking of municipalities when using the Employment Index (employment rate per 1000 population) with the rankings when using the NDMP and the Consumption Index respectively. One can observe huge average changes in rankings of municipalities when using the Employment Index, and considerable negative correlation between the impact of this index on municipal rankings versus the impact of the consumption or material production index. As we consider consumption and material production far more significant parameters for estimating municipal underdevelopment for the reasons explained throughout the study, we omit employment from the composite index.

Graph 2: Ranking of Municipalities when using Employment Index vs. NDMP vs. Consumption Index.
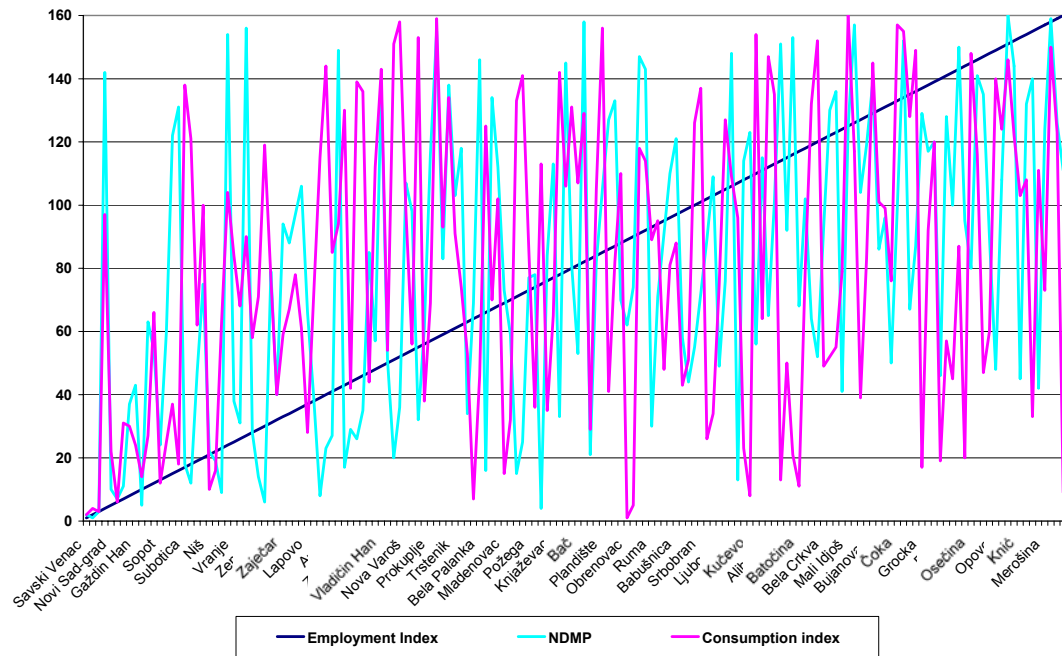
6. Natural increase (birth rate – mortality rate)

This indicator has been used in order to understand the age structure of the population. If a municipality has a negative natural increase, one of the implications would be that there are more old than young in the population and that the municipality is dying off as the young are moving into urban areas (e.g. CLDS/SKGO use this parameter in their study). However, a negative natural increase only tells us that more people die than are being born, and this can be a consequence of high infant mortality, presence of deadly diseases, or even a high rate of murders due to criminal activities. It is debatable whether we can make any conclusions on the age structure of the population based on the natural increase.

7. Illiteracy rate

Instead of using a total illiteracy rate as an indicator of underdevelopment, illiteracy rate should be disaggregated by age groups. Most of the illiterate people in Serbia are above 65 years of age, which is a normal occurence for pre II World War generations, and not a parameter to measure underdevelopment by. Also, it is questionable how illiteracy is determined in Serbia. Besides literacy, it is important to account for numeracy as well.

8. Net donations (per capita)

If donations are measured at municipal or regional level, it is impossible to account for projects which are not targeted geographically, but are instead targeting vulnerable groups, such as Roma, so we will underestimate the total

amount of donations. Also, donations are conditioned by political and ethnic questions in Serbia, such as the proximity of certain municipalities to the Kosovo border, and additionally, some municipalities attract more funds because of better capacities and more apt local authorities able to secure funding. Finally, the amount of funds directed at a project does not necessarily reflect the project's success, and corruption and mismanagement of funds should also be considered. Therefore, there is not necessarily a direct link between underdevelopment and donated funds, and the link between development prospects and donation size is not entirely clear-cut.

It is important to consider the benefits of a donation to the population of a municipality. Is there a purpose in looking at donations per capita, if only one segment of the population benefits from the project? Also, improvements in wellbeing of a municipality can be mistakenly assigned to the donation size when it is rather the case of simultaneity. Unobservable characteristics of the population or local authorities, e.g. openness to new ideas or entrepreneurial spirit, may have affected both the size of donations and the improvement in wellbeing, and we can wrongly assign this improvement in wellbeing to the donation size.

9. Gini coefficient of inequality

The Gini coefficient in Serbia is relatively low, compared to other countries in the region. It could easily happen that the richest segment of Serbia's population has not been taken into account when calculating the Gini coefficient. Milanovic (2006) argues that, since Gini in Serbia is calculated from a sample, it is highly likely that rich households refuse to participate in the surveys. He suggests that the rich may refuse to report their income not only for the fear of tax authorities, but for fear from crime in an increasingly polarised society.

There are also arguments that one of the disadvantages of the Gini coefficient is that it is not additive across groups, i.e. the total Gini of a society is not equal to the sum of the Ginis for its sub-groups, so we should ask ourselves how relevant Gini would be at municipal level. A disadvantage of both the Gini coefficients and the Theil indices is that they vary when the distribution varies, no matter if the change occurs at the top or at the bottom or in the middle (any transfer of income between two individuals has an impact on the indices, irrespective of whether it takes place among the rich, among the poor or between the rich and the poor). If a society is most concerned about the share of income of the people at the bottom, a better indicator may be a direct measure, such as the share of income that goes to the poorest 10 or 20 percent.

10. Access to communal services (running water, electricity, sanitation etc.)

Access to communal services does not necessarily mean quality of service. There is a large network of communal services in Serbia, but a lot of it has had serious problems with maintenance. Unless we measure quality of the communal services, we cannot say anything about quality of life in that municipality. For example, people with access to running water of unhealthy bio-chemical composition will

seem better off than people with a well, as a healthy water source in front of their house.

11. Presence of Small and Medium Enterprises (SMEs)

Number of SMEs can be observed as an indicator of economic development in a municipality. In the early phase of our project, we suggested to observe the number of SMEs in relation to non-agricultural active workforce. By observing only non-agricultural population, we would avoid the bias against rural areas, guided by the assumption that SMEs grow faster in urban areas. For example, if we compare two municipalities in Serbia, where one has a higher percentage of rural population, we would expect it to have a smaller number of SMEs, and it would not be a reason for concern, but if the one with a higher number of non-agricultural population has a smaller number of SMEs, it would be worth exploring reasons why. However, presence of SMEs is a very ambiguous indicator of economic development. Some SMEs are indicators of a vibrant economic environment, and some have been opened as last resort because of high levels of unemployment. It may well be that wage employment and SMEs are in negative correlation in many municipalities. For these reasons, causality relationships in this context would be too important to omit, and we decided to leave this indicator out. In any case, we will make up for presence of SMEs in our analysis, by replacing it with low voltage electricity consumption, which may be a better indicator of small scale economic activity and productivity.

Additional Comments

It is important to stress that in every country surveys are done periodically, where data for some sectors (e.g. economy, health, poverty) are collected on an annual basis, but some surveys, such as the population census, even reach the time span of 10 years, and are still considered valid and reliable. Since some data is subject to swifter changes than others, recommendations for dynamic updates of data do not need to include yearly data collection practices. For example, since education is not a very dynamic sector, there have probably not been too many changes in conditions of schools around Serbia in the last 4 years, or in the number of primary school graduates. Cost-effectiveness of data collection practices can be accomplished through determining dynamics of changes for certain indicators, and then recommending they be collected more or less often.

We also want to draw attention to the fact that there is an enormous amount of data collected in Serbia already, and that there may be more problems with transparent procedures of data access, rather than data availability. Some of the most valuable sources of data are the National Bank of Serbia (NBS), Elektroprivreda Srbije (EPS), the Treasury and the taxing department of the Ministry of Finance, The Public Health Institute – BATUT.

For example, in order to estimate the total amount of remittances per municipality, one would need to encompass i) unofficial and ii) official remittances.

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i) Unofficial remittances can be estimated by using data on total foreign currency purchases by all foreign exchange offices (commercial banks + NBS exchange offices) in the country, disaggregated by location, and these data are available in the NBS. Net purchases of foreign currency are made up of remittances, foreign tourism and the inflows generated in the unregistered economy (which is generally 'euroised'), but since the majority of these purchases come from remittances, the number would have to be adjusted for the estimated income from foreign tourism and inflows from the unregistered economy per municipality in order to be significant.

ii) Official remittances can be calculated from data on remittances received to people's bank accounts from abroad, and these are data entirely registered by the NBS. These two figures could be added by municipality to portray income from remittances per municipality. In order to illustrate how valuable these data would be for our research, it is important to mention that FREN's estimates for annual level of remittances amounts to around 2bn euros at national level, which forms around 10% of the Serbian GDP. Since reliance on remittances is entirely regionalised in Serbia, it is a very significant source of individuals' disposable income in some municipalities, and by no means should be ignored.

The EPS data on low electricity consumption for Vojvodina is still missing, but once obtained, it can be easily inserted into the study. The taxing authorities and the Treasury provided information on local as well as national taxes collected on wages, profit and other goods and services. The numerous uses of these data should be explored further.

References:

Arandarenko, Dr Mihail, Faculty of Economics, University of Belgrade, personal communication, October 11, 2006

CEVES 2005a, 'Serbia's Economy: The Stylized Facts 2000-2005', Volume I, http://www.fren.org.yu/sr/index-sr.htm

CEVES 2005b, 'Serbia's Economy: The Stylized Facts 2000-2005', Volume II, http://www.fren.org.yu/sr/index-sr.htm

Galbraith, James Garcilazo, Enrique 2004, *'Unemployment, Inequality and the Policy of Europe: 1984-2000'*, Working Paper No. 14, March 2004, Presented by James Galbraith at The American University of Paris, Thursday the 23rd of September 2004

Milanovic, Branko 2006, 'Raspolućena društva', *Politika Online*, October 25, http://www.politika.co.yu/detaljno_arhiva.php?nid=10207&y=2006&m=10&d=25

Stanic, Katarina 2006, 'Spotlight on: Registered Employment and Wages – Statistical Data and Trends 2000-2005', *Quarterly Monitor*, Issue 3, FREN

Annex 4: Interpretation of results
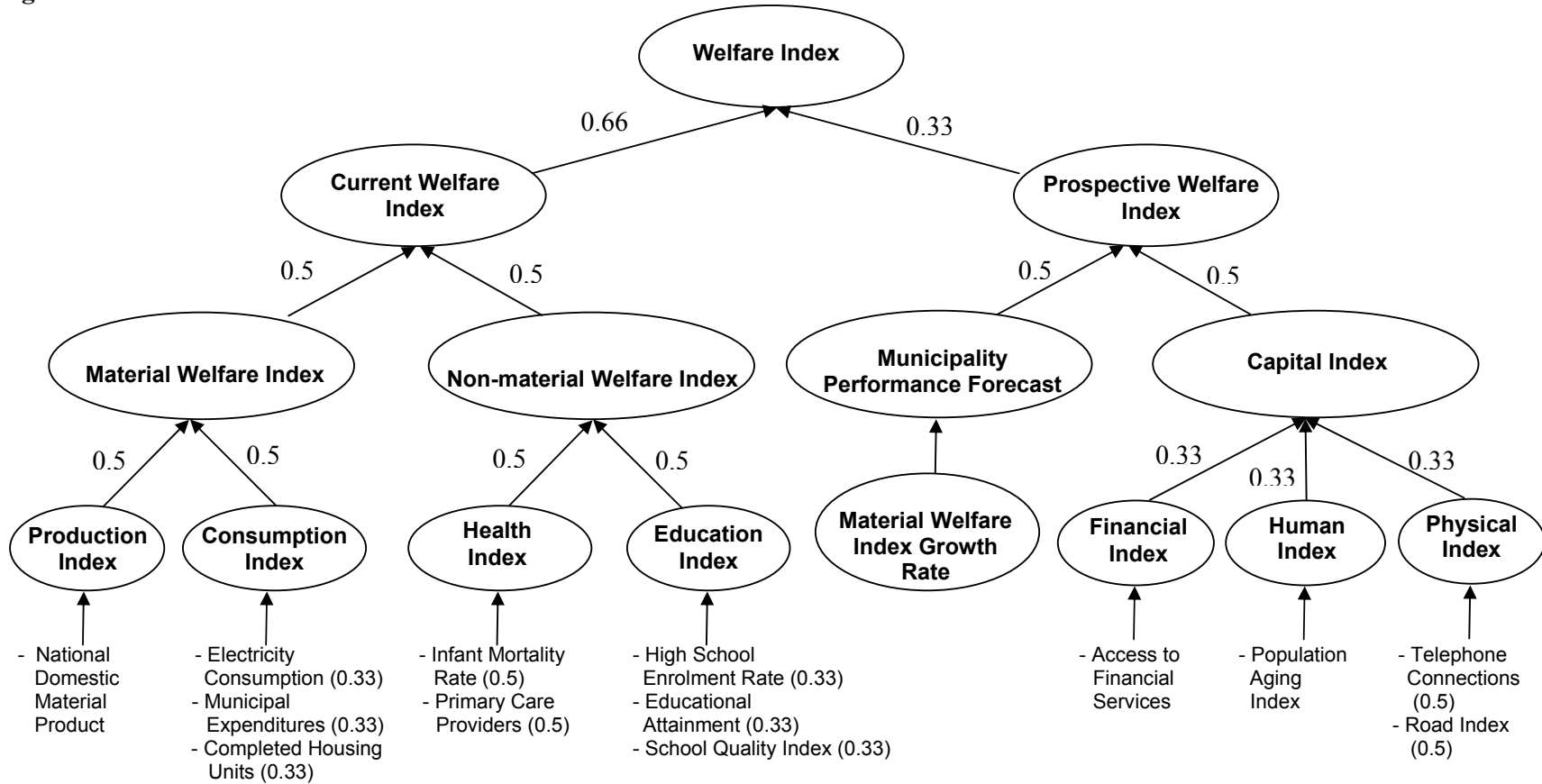
Figure 1: Index Tree

Figure 1 illustrates the manner in which the chosen indicators were constructed into complex indices. The numbers along the arrows and next to the simple indicators represent weights given to each indicator/index in order to construct the next level index. All the indicators and indices are inserted into the DevInfo 4.0 database, and municipalities can be ranked by each of the indicators/indices presented in Figure 1.

Below are presented some of the more interesting findings from our testing of indicators. We show the changes in rankings of municipalities when an indicator is omitted from an index.

Graph 3 illustrates the difference in ranking of municipalities when using the complete Consumption Index and the Consumption Index when Completed Housing Units are omitted. The complete Consumption Index, which includes the following three indicators with equal weights: Municipal Expenditures, Low Voltage Electricity Consumption and Completed Housing Units, is represented by the straight dark blue line (since the x and y axis represent names of municipalities and their rankings respectively using the Consumption Index). The light blue line illustrates the rankings when only Municipal Expenditures and Low Voltage Electricity Consumption are used. We can see that the average change in rankings is high, and therefore conclude that Completed Housing Units considerably affect the rankings.

Graph 3: Rankings of Municipalities using Consumption Index with vs. without Completed Housing Units
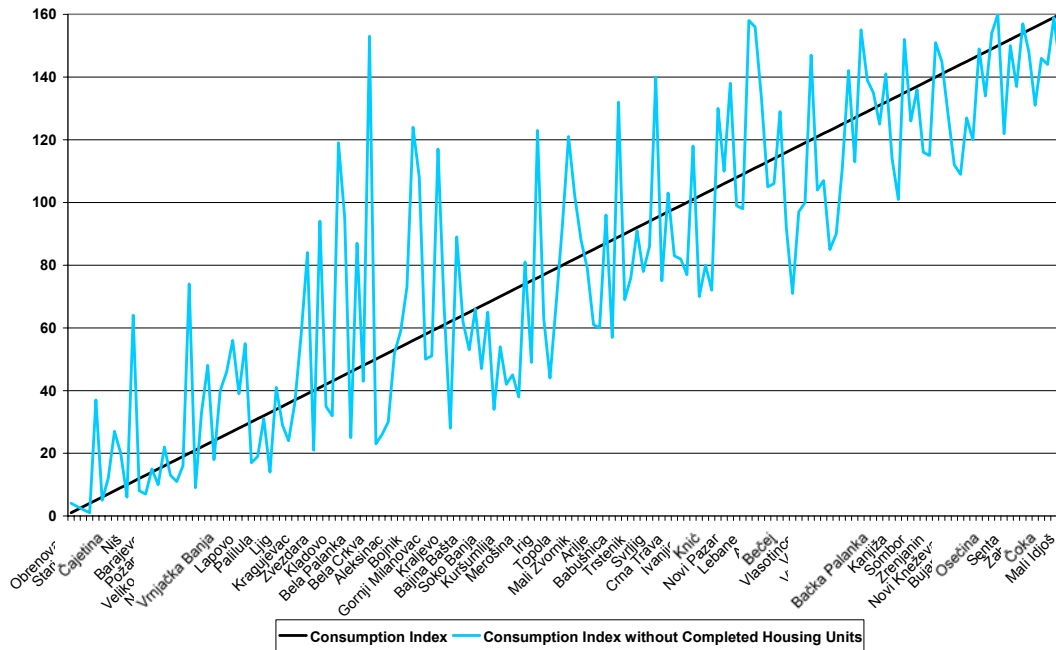
Graph 4 shows changes in the ranking of municipalities when Municipal Expenditures are omitted from the Consumption Index. We can see that the average change in rankings is insignificant in comparison to omitting the Completed Housing Units in Graph 3. This indicates that Municipal Expenditures could be entirely omitted as an indicator from our analysis, and the ranking of municipalities would not be considerably affected. However, the data used for Municipal Expenditures is from 2005, hence we cannot conclude whether the influence of this indicator is stable in the long term. Therefore, we decided to leave the indicator in the analysis, as it should be monitored in the next couple of years to see how it behaves within the Consumption Index. Another reason for why we want to leave the indicator is because of the following: if changes in laws on financing of local authorities in Serbia take place, local spending patterns will change and may begin to play a greater role in explaining consumption at the municipal level.

Graph 4: Rankings of Municipalities using Consumption Index with vs. without Municipal Expenditures
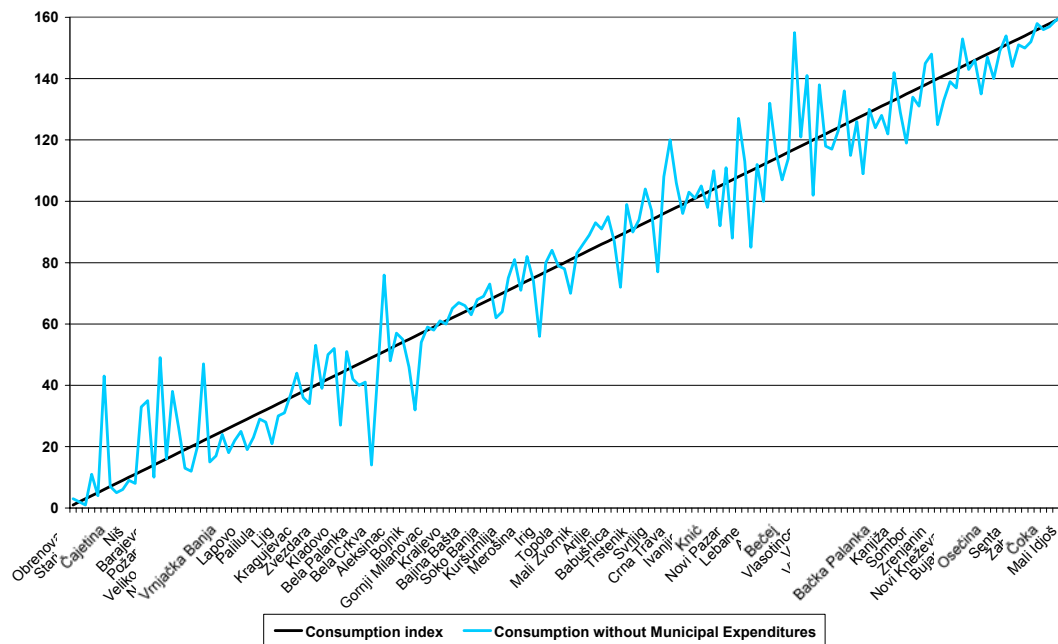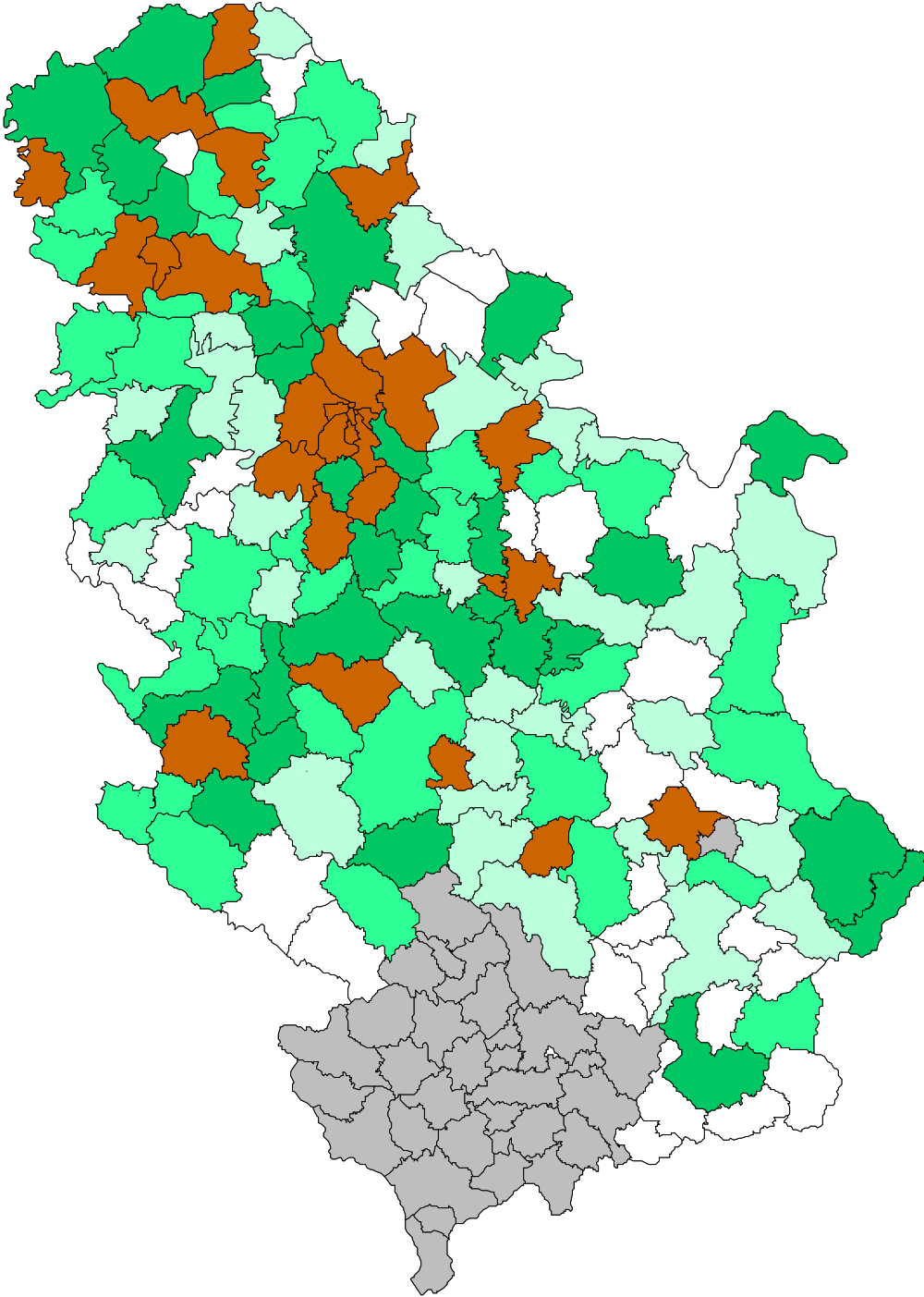

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Figure 2: Map of Municipalities – Welfare Index

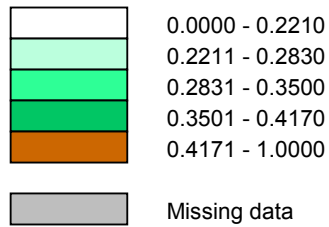|	0.0000 - 0.2210
	0.2211 - 0.2830
	0.2831 - 0.3500
	0.3501 - 0.4170
	0.4171 - 1.0000

	Missing data

Figure 2 illustrates the various levels of development of municipalities across Serbia using the final composite index – Welfare Index. The only municipality with missing data (excluding Kosovo) is Niška Banja, data for which we averaged with the city of Niš for purpose of easier analysis. The map should be interpreted in the following manner: the lower the index value, the more underdeveloped the municipality.

Annex 5: Contacts

Throughout the consultancy, we established contact with the following people/organisations:

1. SKGO
Svetlana Babić
Aleksandar Popović

2. CLDS
Gordana Matković
Marko Paunović – comments to first draft

3. RZS
Dragan Vukmirović
Miladin Kovačević
Vladan Božanić
Dragana Djoković-Papić

4. EAR
Danka Bogetić

5. UNDP
Tom Thorogood
Nenad Moslavac

6. Royal Haskoning – EAR project
Mirjana Strugar

7. Obrazovni forum (NGO)
Ana Pešikan
Ivan Ivić
Ratko Jankov
Raša Karapandža

8. USAID/MEGA
Steven Rosenberg

9. Ministarstvo rada, zapošljavanja i socijalne politike
Milka Damjanović

10. Republički zavod za razvoj
Jana ? – Jasminin kontakt

11. Ekonomski Fakultet
Professor Mihail Arandarenko
Professor Jurij Bajec
Asssistant Professor Vladimir Vasić

12. Bearing Point

Katarina Stanić
Nikola Altiparmakov

13. Strategija za Odrzivi Razvoj
Jovan Protić
Dr. Radmilo Pešić

14. Institut za demografska istraživanja
Goran Penev

15. Telekom Srbija
Danko Brčerević

16. CEVES/FREN
Kori Udovički
Duško Vasiljević
Vuk Đoković
Marina Vojvodičan
Dejan Kovjenić
Jasna Dimitrijević

17. EPS - kao izvor podataka o struji

18. **UNHCR** - kao izvor podataka o raseljenim i izbeglicama

Three seminars were organised in relation to the project:

The first was internal, and it was attended by the CEVES/FREN team members. The second one was organised with prof. Mihail Arandarenko, Dr Kori Udovički and Katarina Stanić. The final seminar was open for the faculty and students of the Economics Faculty of the University of Belgrade, and some of the more significant contributors were prof. Jurij Bajec, Katarina Stanić, Dr Kori Udovički, and Dr Vladimir Vasić.