

Romania

Systematic Country Diagnostic

BACKGROUND NOTE

Natural Capital

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Acknowledgments

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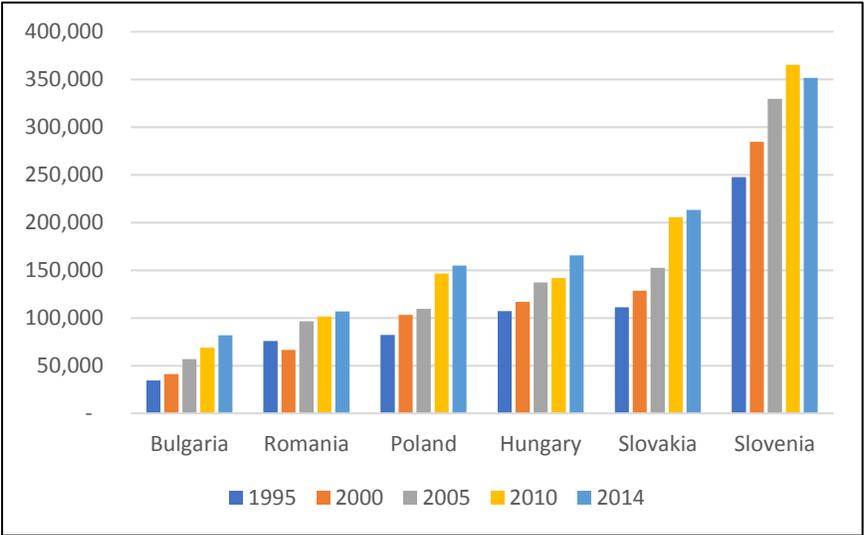
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Introduction

1. **Wealth accounting, including natural capital accounting (NCA), is a more appropriate metric for measuring sustainable growth.** The common measure of economic growth is Gross Domestic Product (GDP). However, GDP looks at only one part of economic performance—income—and says nothing about the wealth and assets that underlie this income. This is analogous to measuring a company’s performance by only looking at its income statement (sales) and not its balance sheet—which includes income, assets, and liabilities for a more complete picture of its overall sustainability. Total wealth is the sum of produced capital, human capital, and natural capital (plus net foreign assets) (see Annex 1. Total Wealth for details).¹ When a country over-exploits its renewable resources such as land resources, or draws down its finite resources such as oil or mineral resources, it is depleting its natural capital and this should be accounted for in measuring sustainable growth. The omission is largely by construction, since the services that natural capital provides typically do not have explicit market prices or values and thus the full contribution is not included. For example, forests provide service flows such as carbon sequestration, erosion control, and air filtration. The lack of elicitation of these values precludes their inclusion and means that the traditional measure of GDP can give misleading signals about the long-term economic performance and well-being of a country.

2. **Romania’s per capita total wealth is comparable within the upper middle income group globally, but it is substantially lower than the regional average for Europe and Central Asia and amongst its neighbors.** For 2014, Romania’s total wealth was estimated at \$2.1 trillion, and per capita wealth at \$107,000. Romania’s total wealth per capita is slightly lower than its income group, where the average for upper-middle-income countries is \$114,000. But it is substantially lower than its regional average, which is about \$368,000 for Europe and Central Asia. Romania is also at the lower end when compared to its Eastern European peers (**Figure 1**).

Figure 1. Per capita total wealth in selected ECA countries (in constant 2014 US\$)



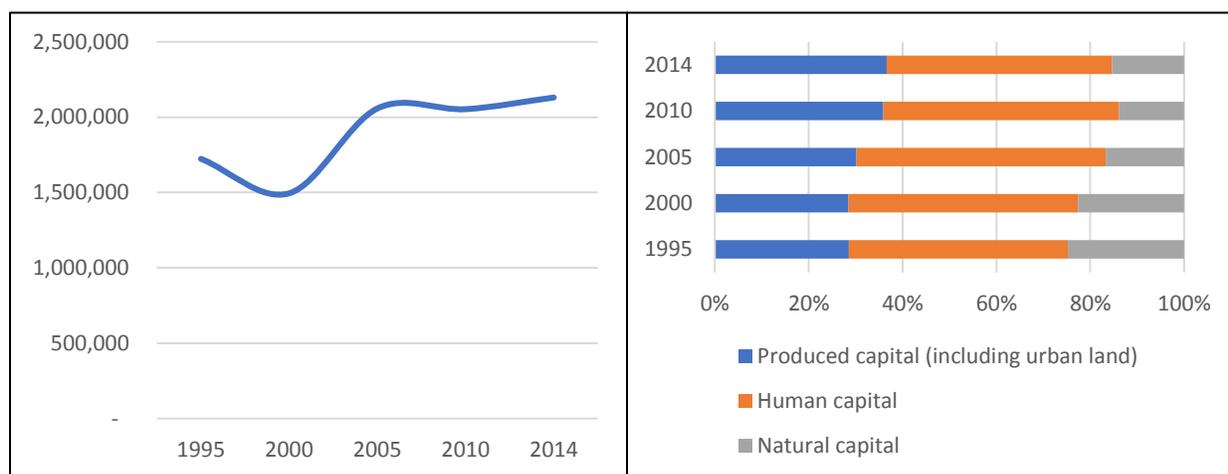
Source: World Bank, Measures of Comprehensive Wealth, 2016.

Romania's Natural Capital

3. **Total wealth in Romania has been growing over time, with greater contributions from produced and human capital, but less from natural capital.** Total wealth grew 24 percent from 1995 to 2014 (the size of the pie), but the composition also changed (**Figure 2** and **Figure 3**). Produced capital, including urban land, grew 67 percent and now represents 38 percent of total wealth. Human capital grew by 34 percent and now represents 50 percent of total wealth. Conversely, natural capital decreased 24 percent from 1995 to 2014, and now represents only 16 percent of total wealth.

Figure 2. Total wealth, 1995–2014 (millions, constant 2014 US\$)

Figure 3. Change in the composition of total wealth over time

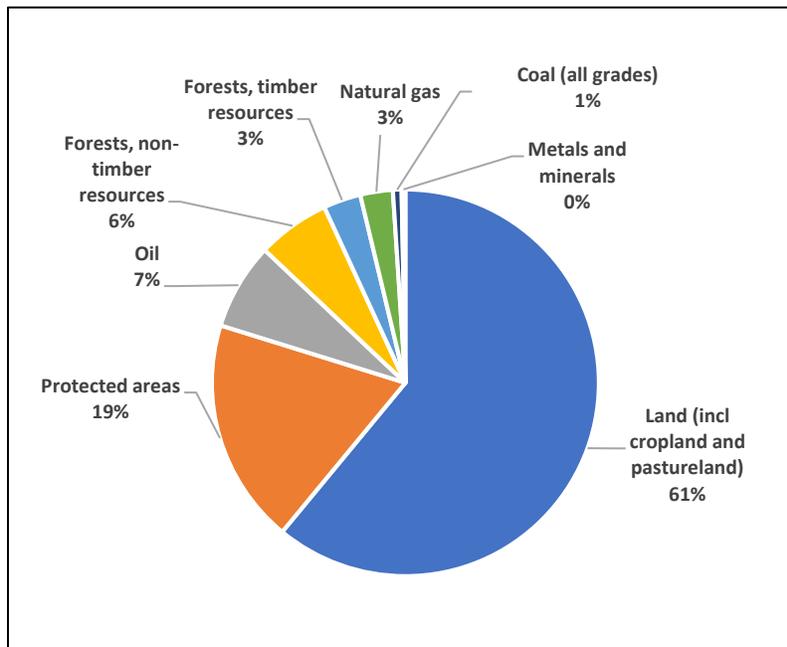


Source: World Bank, Measures of Comprehensive Wealth, 2016.

4. **A decomposition of natural capital reveals that the main driver of its decline is the conversion of agricultural and pasture land to urban land.** Natural capital wealth in Romania mostly comprises agricultural cropland and pasture land at 61 percent and protected areas at 19 percent (**Figure 4**). Protected areas grew substantially over the period from 1995 to 2014, mostly due to Romania declaring its Natura 2000 network² of protected areas (**Table 1**, see number for 2005). It is likely that land was reclassified as protected area from other categories of land (**Figure 5**[Error! Reference source not found.](#)). However, protected areas remain a smaller share of overall natural capital value. The main driver of the decline in natural capital appears to be from the decline in crop and pasture land, at –39 percent and –22 percent respectively. Using subnational land cover data derived from remote sensing and geospatial data, we see that cropland shrunk by 8,499 km² while urban areas grew from 3,729 to 8,697 km² between 1995 and 2015 (**Figure 6** and

5. **Table 2**). The decline of natural capital value, although to a smaller degree, can also be explained by the decline in timber resources (–61%) and sub-soil assets (–32%).

Figure 4. Composition of natural capital, 2014



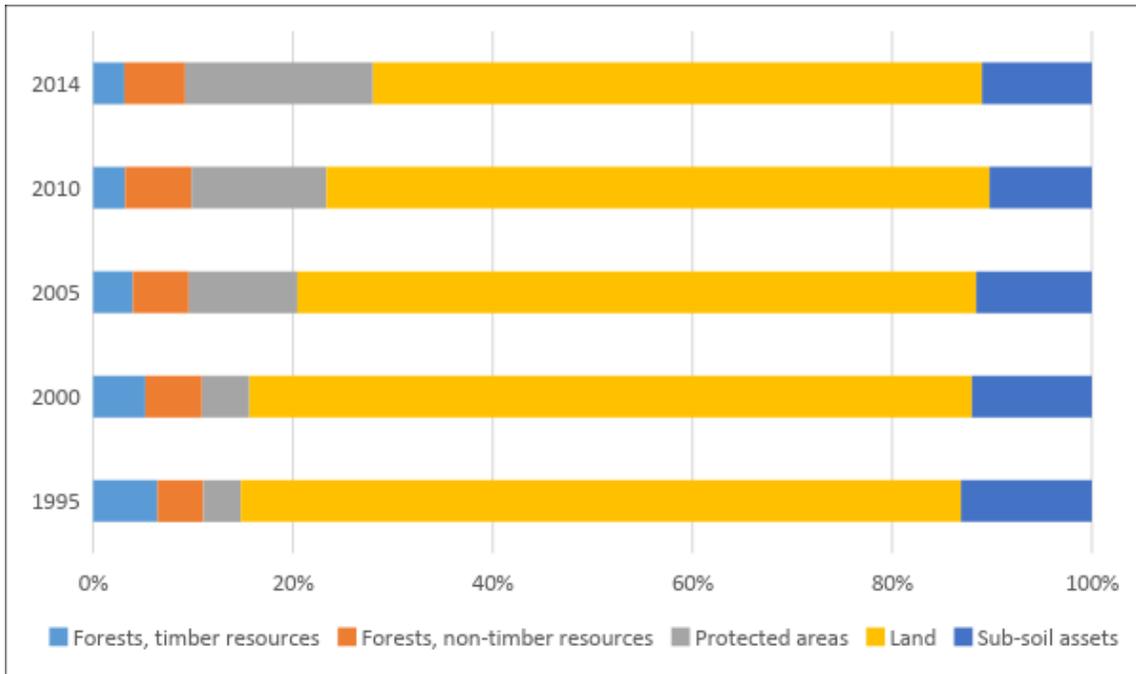
Source: World Bank, Measures of Comprehensive Wealth, 2016.

Table 1. Change in natural capital, 1995–2014 (millions of constant 2014 US\$)

Resource	1995	2000	2005	2010	2014	% change, 1995-2014
Forests, timber resources	27,435	17,987	13,943	9,625	10,744	-61%
Forests, non-timber resources	19,601	19,593	19,670	20,051	20,903	7%
Protected areas	15,981	16,345	38,136	40,787	64,668	305%
Land	307,401	249,436	238,557	200,246	209,622	-32%
Cropland	177,970	141,571	134,555	92,474	108,683	-39%
Pastureland	129,431	107,865	104,002	107,773	100,938	-22%
Sub-soil assets	55,842	41,403	40,626	30,901	37,800	-32%
Fossil energy resources	53,958	40,591	39,763	30,111	36,735	-32%
Oil	24,423	23,815	27,570	20,751	24,912	2%
Natural gas	27,363	16,329	10,132	5,593	9,333	-66%
Coal (all grades)	2,171	447	2,060	3,767	2,490	15%
Metals and minerals	1,884	812	863	790	1,065	-43%

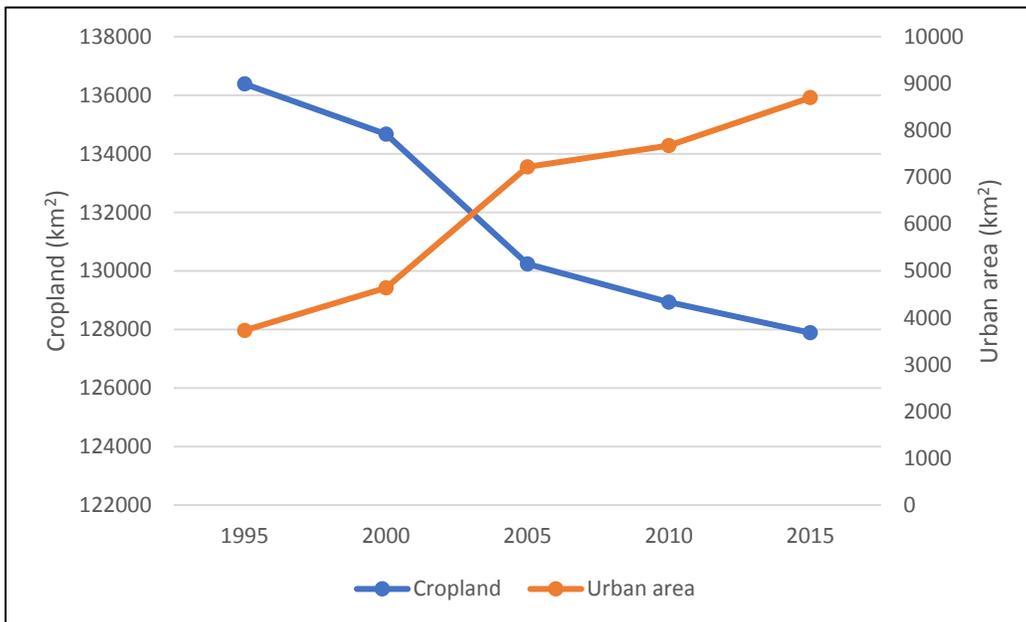
Source: World Bank, Measures of Comprehensive Wealth, 2016.

Figure 5. Change in the composition of natural capital over time



Source: World Bank, Measures of Comprehensive Wealth, 2016.

Figure 6. Change in cropland and urban area, 1995-2015



Sources: World Bank using ESA-CCI Land Cover data (2017) and the Hidden Dimensions Dataset (2017).

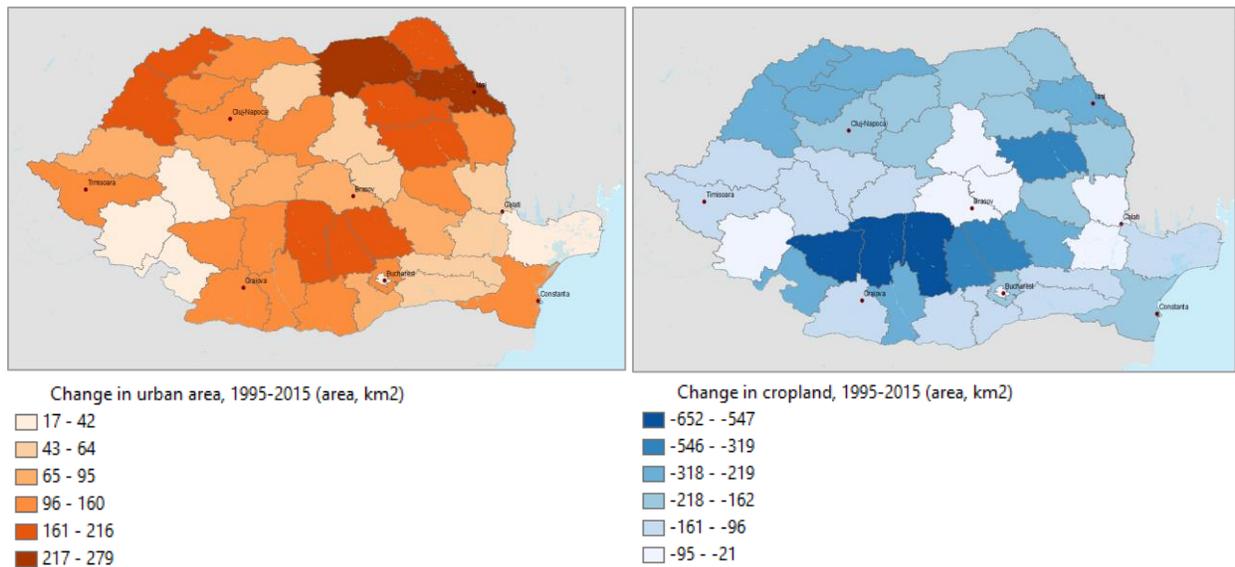
Table 2. Change in cropland and urban area, 1995–2015

Land cover (km ²)	1995	2000	2005	2010	2015	Change, 1995-2015	% change 1995-2015
Cropland	136,385	134,672	130,237	128,933	127,886	-8,499	-6.2
Urban	3,729	4,637	7,222	7,671	8,697	4,968	133.2

Sources: World Bank using ESA-CCI Land Cover data (2017) and the Hidden Dimensions Dataset (2017).

6. **These changes are uneven across the country—but there are specific areas in the North and South where land conversions coincide.** Urban expansion is concentrated in the northeast, with the provinces of Suceava and Iasi recording more than 217 km² of new urban areas (**Figure 7**). And the decline in croplands is concentrated in the south-central area, with the provinces of Gorj, Valcea and Arges decreasing by more than 547 km². The **land conversion hotspots**, or provinces with significant urban expansion and cropland decreases, are concentrated in the north and south of the country (Error! Reference source not found.). Conversion is most prevalent in the provinces of Bihor, Salaj, Satu Mare, Maramures, Suceava, Iasi, Bacau, Gorj, Valcea, Arges, Olt, Dambovita, and Prahova.

Figure 7. Urban expansion is concentrated in the northeast and declining cropland is in the south-central area



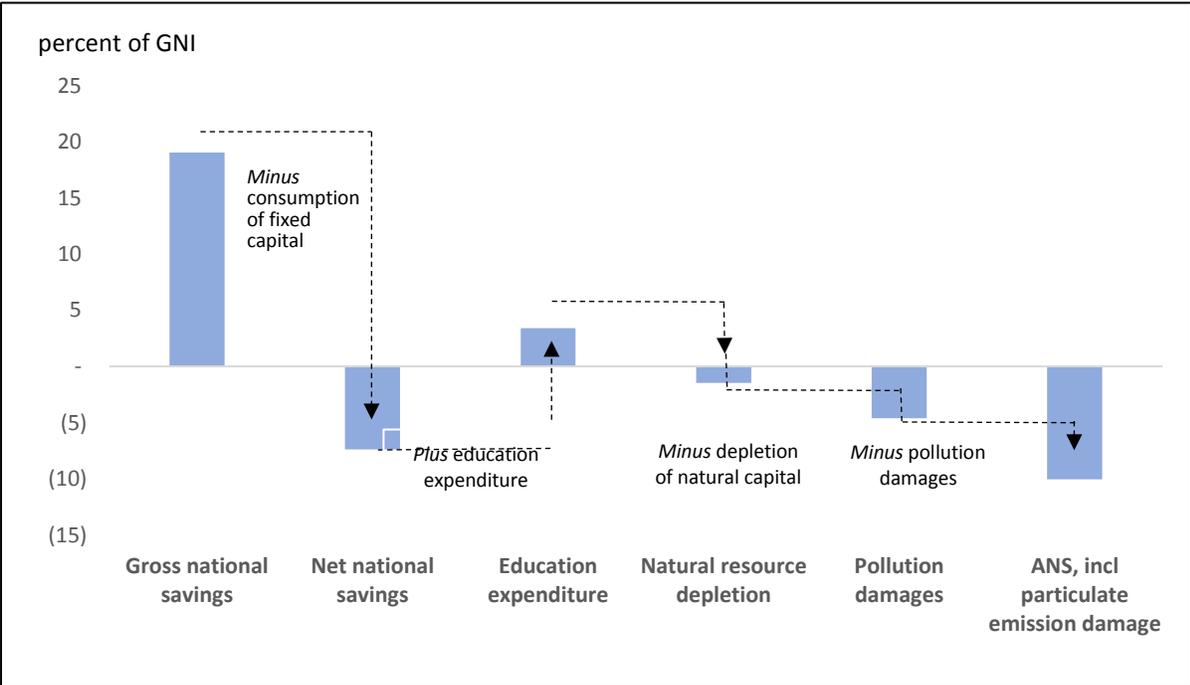
Sources: World Bank using ESA-CCI Land Cover data (2017) and the Hidden Dimensions Dataset (2017).

Sustainable Consumption, Adjusted Net Savings, and Building Greater Economic Resilience

8. **Adjusted Net Savings (ANS) measures whether a country is saving and investing at a sustainable rate.** A country’s wealth changes through the process of savings and investment, so it is instructive to consider how national savings has changed over time. ANS is a macro-level index of sustainable development, building on the concepts of green national accounts. It extends the conventional net savings by adding human capital accumulation and deducting natural resources losses (see **Annex 2. Calculating Adjusted Net Savings** for details). It means that ANS measures the true rate of savings in an economy, after taking into account investments in human capital, depletion of natural resources, and damage caused by pollution. Thus, the idea is that sustainability requires the maintenance of a constant stock of extended wealth that is not limited to natural resources but that also includes physical, productive capital, as measured in traditional national accounts, and human capital. Net ANS represents the change in this total wealth over a given time period (a year).

9. **Romania’s savings and investment path was unsustainable in the 1990’s, as reflected in a negative ANS.** **Figure 9** shows the calculation of ANS for Romania in 1995—a period characterized by high consumption, negative net national savings, and negative ANS. Gross national saving was 19 percent of Gross National Income (GNI). After adjusting for the consumption of fixed capital (minus 26.4 percent), education expenditures (plus 3.4 percent), depletion of natural resources³ (minus 1.5 percent), and pollution damages (minus 4.6 percent), Romania’s adjusted net saving was around –10 percent of GNI. This was an unsustainable path.

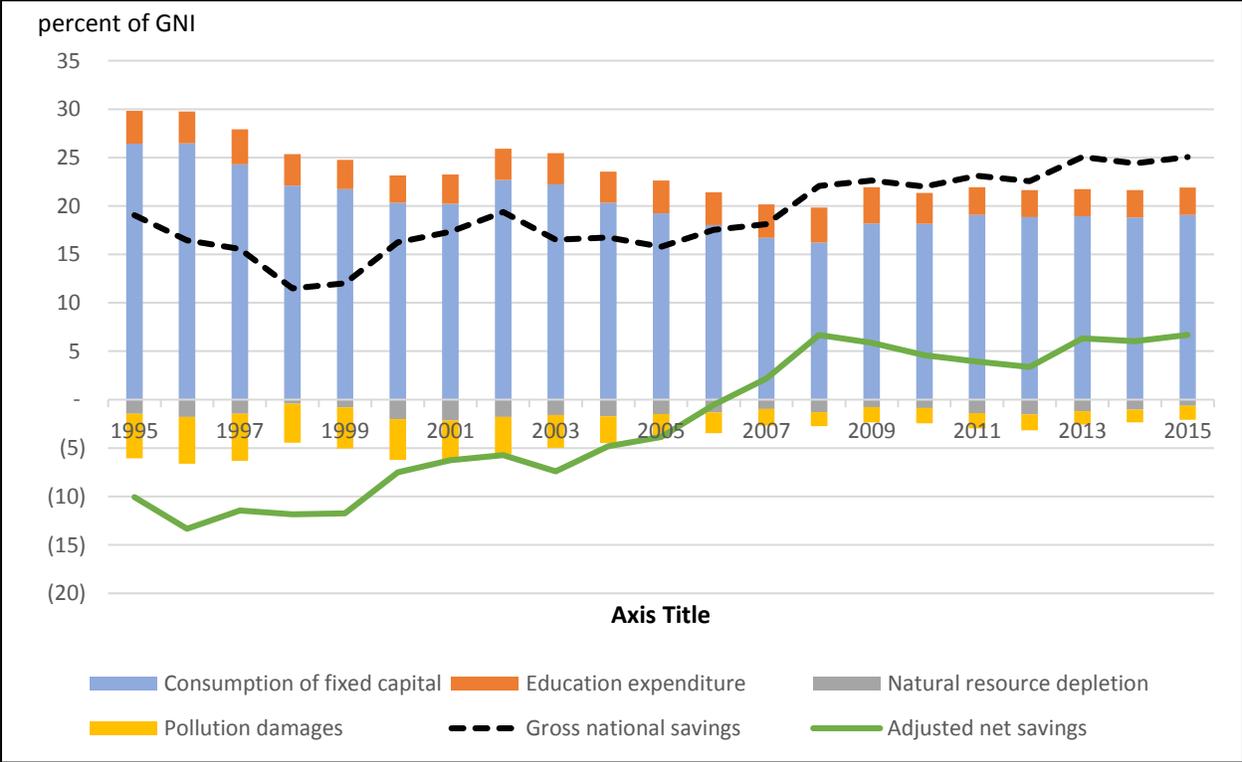
Figure 9. Calculating adjusted net savings for Romania in 1995



Source: World Development Indicators 2016, World Bank.

10. **Romania’s ANS improved over time, and became positive in 2007, owing to increased saving and reduced consumption—building greater economic resilience.** Romania’s savings trend over the past two decades is shown in **Figure 10**, where the line graphs compare the country’s gross national saving to its adjusted net saving from 1995 to 2015. Looking first at the trend in Gross National Savings (GNS), Romania’s total resources available for investment remained between 15–20 percent from the mid-1990s to 2007, and increasing to around 25 percent by 2015. Though ANS generally tracked the movement of GNS, it remained below zero until 2007. Part of the convergence of ANS with GNS was because of a reduction in the consumption of fixed capital, which fell from 26 percent in 1995 to 19 percent by 2015. Although more modest, the period was also characterized by gains from reduced CO₂ damage (falling from 4 percent to 1 percent of GNI) and particulate matter pollution (falling from 0.8 percent to 0.3 percent). Resources invested in education remained at only about 3 percent of GNI over the entire period. The period of negative ANS prior to 2007, and ANS reaching near 7 percent of GNI by 2015, suggests that Romania has taken steps in saving and investing more, while moderating its consumption. Nonrenewable resources are not large in Romania, so there is little to deplete and account for, but nonrenewable resources such as land and forests do provide significant nonmarket benefits and wealth to the economy. The current path of saving and investing, as defined by ANS, appears to be on a much more sustainable growth path, and the steps taken since the late 1990s have built greater economic resilience.

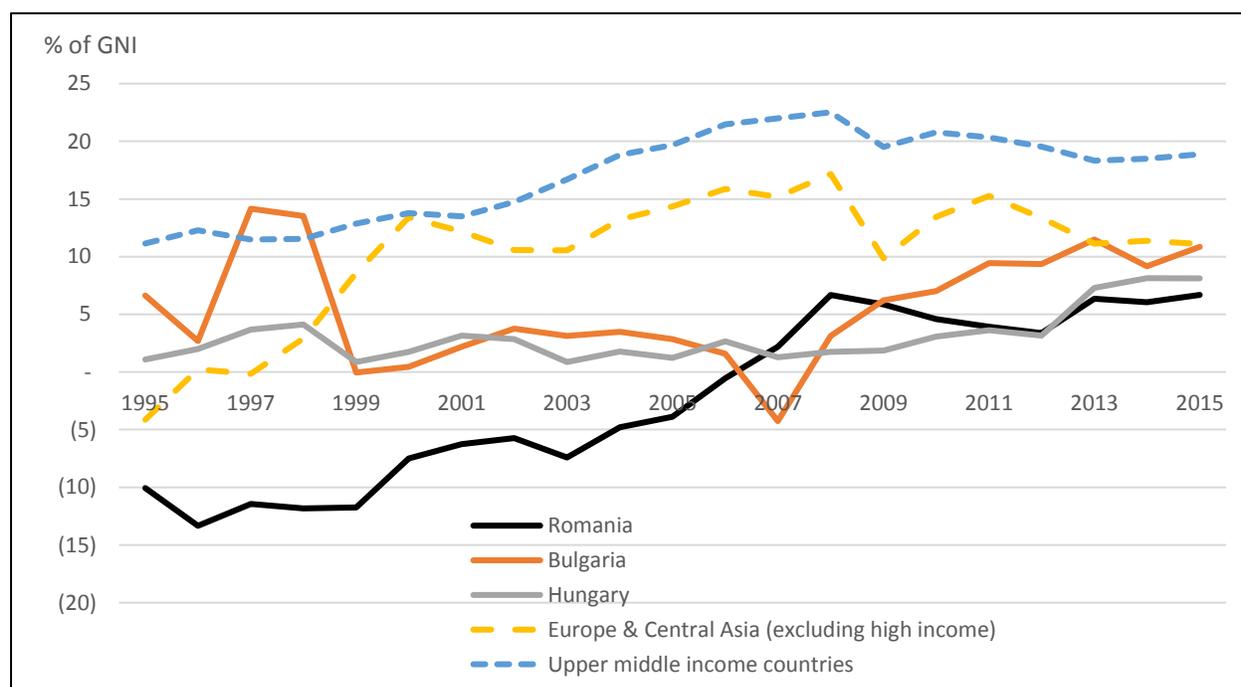
Figure 10. Romania’s adjusted net saving over time, 1995–2015



Source: World Development Indicators 2016, World Bank.

11. **Romania’s ANS was much lower than in ECA or the upper-middle-income group, became positive in 2007, and grew to converge with other ECA countries.** Figure 11 compares savings trends of Romania, Bulgaria, Hungary to its regional and income group from 1995 to 2015. It is quite clear that Romania’s negative ANS prior to 2007 was not a shared experience among other ECA countries or the upper-middle-income (UMI) group. Romania’s ANS has been well below both ECA countries and the UMI group over the entire period. This is partly explained by high consumption leading to a negative savings rate. However, the trend of Romania’s ANS was similar to the UMI group, steadily rising over time and converging with other ECA countries. With the exception of Bulgaria in 2007, the other ECA countries appeared to maintain a positive ANS during the entire period.

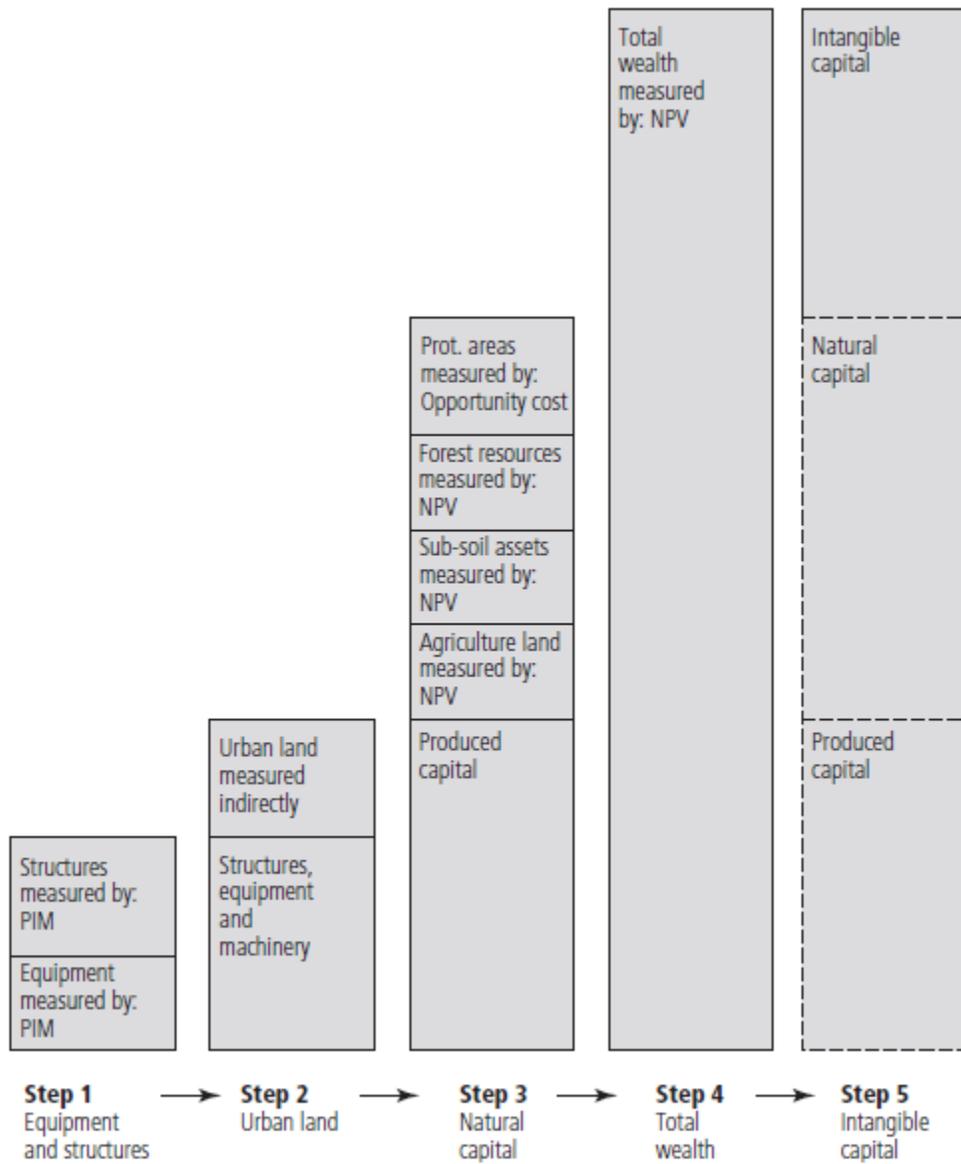
Figure 11. Adjusted Net Saving: Romania, Bulgaria, Hungary, Upper-Middle-Income Countries, and Europe and Central Asia



Source: World Development Indicators 2016, World Bank.

12. **Natural capital and adjusted net saving’s analyses can be used for policy dialogue and in targeting deeper dives in sector work.** The analysis presented here is just a start in understanding a country’s environmental performance relative to economic growth. It can be completed quickly, as the informational databases are publicly available and updated on a regular basis. Combining this analysis with deeper (sector) dives can reveal the determinants and constraints the country may be facing, and policymakers can begin to think of piloting interventions that may address these constraints. What is not included in this analysis is the distributional aspects of these gains or losses. A meaningful next step would be to look at how these impacts are distributed across the country and are affecting the livelihoods of those who are dependent on these natural assets. For example, from Figure 8 it is clear that land conversion is located in specific hotspots, and it would be good to know more about what is really driving those changes and how it is affecting the livelihoods of those collocated. Developing hypotheses around these observations and designing analytical work to help answer these questions can lead to policy reform and better targeting of interventions—particularly for those most vulnerable to changes in natural assets (for example, the bottom 40 percent in terms of income).

Annex 1. Total Wealth Calculation



Annex 2. Calculating Adjusted Net Savings

First appearing in the 1999 edition of the *World Development Indicators*, the World Bank's adjusted net savings (ANS) indicator was created to give national-level decision makers a clear, relatively simple measure of how sustainable their countries' growth policies are. While standard national accounts (SNA) only consider the value of a limited set of manufactured capital and assets, ANS offers a more inclusive picture of changes in a comprehensive set of capital assets that constitute a nation's wealth base, including a knowledgeable and skilled workforce and natural resources such as forests, fossil energy, metals, and minerals. The indicator also captures changes in these assets as a result of pollution and climate change. Positive saving indicates an investment in the future—that a nation is accumulating the assets needed to build up its wealth and ensure its economic growth over the longer term. Years of negative saving, on the other hand, suggest that a country is running down its capital stock and is on an unsustainable growth path.

Adjusted net saving is derived from the standard national accounting measure of gross national saving (GNS), by making four types of adjustments:

1. A deduction for the depreciation of produced capital, measured by the consumption of fixed capital, which equals net national saving;
2. The addition of investments in human capital, measured by current public expenditures on education;
3. A deduction for the depletion of natural capital, including minerals, energy, and forest resources; and
4. A deduction for the damages from pollution, including carbon emissions and exposure to particulate matter.

It is important to note that these estimates are indicative and provide a big-picture overview, as they are based on publicly available global databases. The benefit of the ANS dataset is the ability to assess cross-country comparisons and time trends in a consistent framework. But a more robust picture of Romania's adjusted net savings can be achieved through a thorough assessment using country-specific data, modifying any methodological assumptions to its country context, and adding any relevant missing natural capital components (such as land degradation).

¹ Natural capital is measured in this context as the monetary value of subsoil assets (10 minerals, 4 energy resources), agricultural land (crop and pasture), forest land (timber, Non-Wood Forest Products (NTFPs), other services), and protected areas. For a detailed discussion of the valuation methodology, see: *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium* (World Bank, 2011). Available at: <https://siteresources.worldbank.org/ENVIRONMENT/Resources/ChangingWealthNations.pdf>.

² Natura 2000 is the centerpiece of EU nature policy. It is an EU-wide network of *Natura 2000* sites, established under the Birds and Habitats Directives. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats. Over 25,000 sites have already been designated, covering more than one million km².

³ Natural resource depletion includes energy, minerals and forests. Due to data limitations, there was no estimate for net forest loss in the case of Romania.